Environmental Assessment Certificate Application

Volume 4

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Appendix

Appendix C-II: Rev 6 Aboriginal Consultation Report

11 ABORIGINAL CONSULTATION

As set out in the EAO Guidelines, this section of the Application provides information on BC Hydro's engagement with each Aboriginal group potentially affected by the proposed Project. It includes a discussion of potential adverse effects on Aboriginal Interests as a result of the proposed Project. Part A of the Section 11 Order of the BC *Environmental Assessment Act* for the proposed Project defines Aboriginal Interests as "the asserted Aboriginal rights including title, or such determined Aboriginal rights as recognized by Section 35(1) of the *Constitution Act*, 1982 (Aboriginal and Treaty Rights)".

BC Hydro's understanding of each Aboriginal group's asserted or established Aboriginal rights and how the exercise of those rights might be affected by the proposed Project is derived from information from a number of sources. A significant source of information is contained in each Schedule C Aboriginal group's Part C submission. BC Hydro and each Aboriginal group agreed that the Aboriginal groups (see Section 11.1.1 below) would author contributions in Part C of this Application regarding their Aboriginal Interests, and other matters of concern as part of the consultation process on the Project. Since early 2015, BC Hydro and Aboriginal groups have worked cooperatively to ensure completion of the submission.

BC Hydro and the Aboriginal groups agreed that Aboriginal groups would have full discretion over the approach, scope, content, and writing of their contributions so that the contributions accurately reflect their perspective of their respective Aboriginal Interests, and their perspective of the potential adverse impacts of the Project on their interests. As a result, Aboriginal group's Part C contributions are included without edit and in their entirety in this section. While each Aboriginal group has chosen to present the information in a way that is consistent with their 'World View', in general, each submission includes background information on ethnography, language, governance, economy, and reserves. Traditional Ecological Knowledge (TEK) Traditional Land Use Information (TLUS), descriptions of title, rights, and interests in relation to Valued Components, and anticipated adverse Project effects on Aboriginal interests are also included. In addition, each Aboriginal group Part C submission includes suggested measures to avoid, mitigate, or accommodate potential adverse effects based on their understanding and perspectives of the Project.

A Part C writing workshop was held with support from BC Hydro's primary consultant and representatives from the Environmental Assessment Office (July, 23, 2014) and additional capacity funding was made available to support the authorship of Part C.

Aboriginal groups were provided copies of Part B of the draft Application on January 26, 2016, and an updated draft Application on July 29, 2016. This information was provided to assist Aboriginal groups in authoring their respective Part C contributions. Between August and December 2016, meetings were held to review and discuss the potential Project effects and proposed mitigation measures identified in the draft Part B section of the Application.

11.1 Overview of Aboriginal Consultation to Date

On May 22, 2015, the BC EAO issued the Section 11 Order identifying the Aboriginal groups to be consulted by BC Hydro for the proposed Project. Schedule C of the Section 11 Order identifies those Aboriginal groups with asserted interests that could potentially be affected by the Project.

11.1.1 Schedule C Aboriginal Groups

Table 11-1 lists those Schedule C Aboriginal groups identified in the Section 11 Order and located in the generation and transmission component project area with whom BC Hydro must consult.

Table 11-1: Schedule C Aboriginal Groups Potentially Adversely Affected by the Project

Generation Component Project Area		
Ktunaxa Nation	**Okanagan Nation**	**Secwepemc Nation**
• Ktunaxa Nation Council • ʔakisq̓nuk First Nation (Columbia Lake First Nation) • yaqan nuykiy (Lower Kootenay Indian Band) • ʔaq̓am (St. Mary's Indian Band) • ʔakink̓um+asnuq+iʔit (Tobacco Plains Indian Band)	• Okanagan Nation Alliance • Okanagan Indian Band • Westbank First Nation	• Sexqeltqiń (Adams Lake Indian Band) • Neskonlith Indian Band • Splatsin • Simpcw First Nation • Sqwlax [Little Shuswap Lake Indian Band) • Kenpesq't (Shuswap Indian Band)
Capacitor Station Component Project Area		
Okanagan Nation		
• Okanagan Nation Alliance • Penticton Indian Band • Westbank First Nation		

11.1.2 Schedule B Aboriginal Groups

Table 11-2 lists those Schedule B Aboriginal groups identified in the Section 11 Order and located in the generation and transmission component project area that will receive only notifications of EA milestones.

Table 11-2: Schedule B Aboriginal Groups Potentially Adversely Affected by the Project

Generation Component Project Area	
Okanagan Nation	**Secwepemc Nation**
• Okanagan Nation Alliance: • Lower Similkameen Indian Band • Osoyoos Indian Band • Penticton Indian Band • Upper Nicola Band • Upper Similkameen Indian Band	• Bonaparte Indian Band • Shuswap Nation Tribal Council • Skeetchestn Indian Band • Tk'emlups Indian Band • Whispering Pines/Clinton Band

Capacitor Station Component Project Area		
Okanagan Nation Alliance	**Nicola Tribal Association**	**Nlaka'pamux Nation Tribal Council**
• Upper Similkameen Indian Band	• Coldwater Indian Band • Cook's Ferry Indian Band • Nicomen Indian Band • Nooaitch Indian Band • Shackan Indian Band • Siska Indian Band • Upper Nicola Band	• Ashcroft Indian Band • Boothroyd Indian Band • Boston Bar First Nation • Lytton First Nation • Oregon Jack Creek Band • Skuppah Indian Band • Spuzzum First Nation
• Lower Nicola Indian Band		

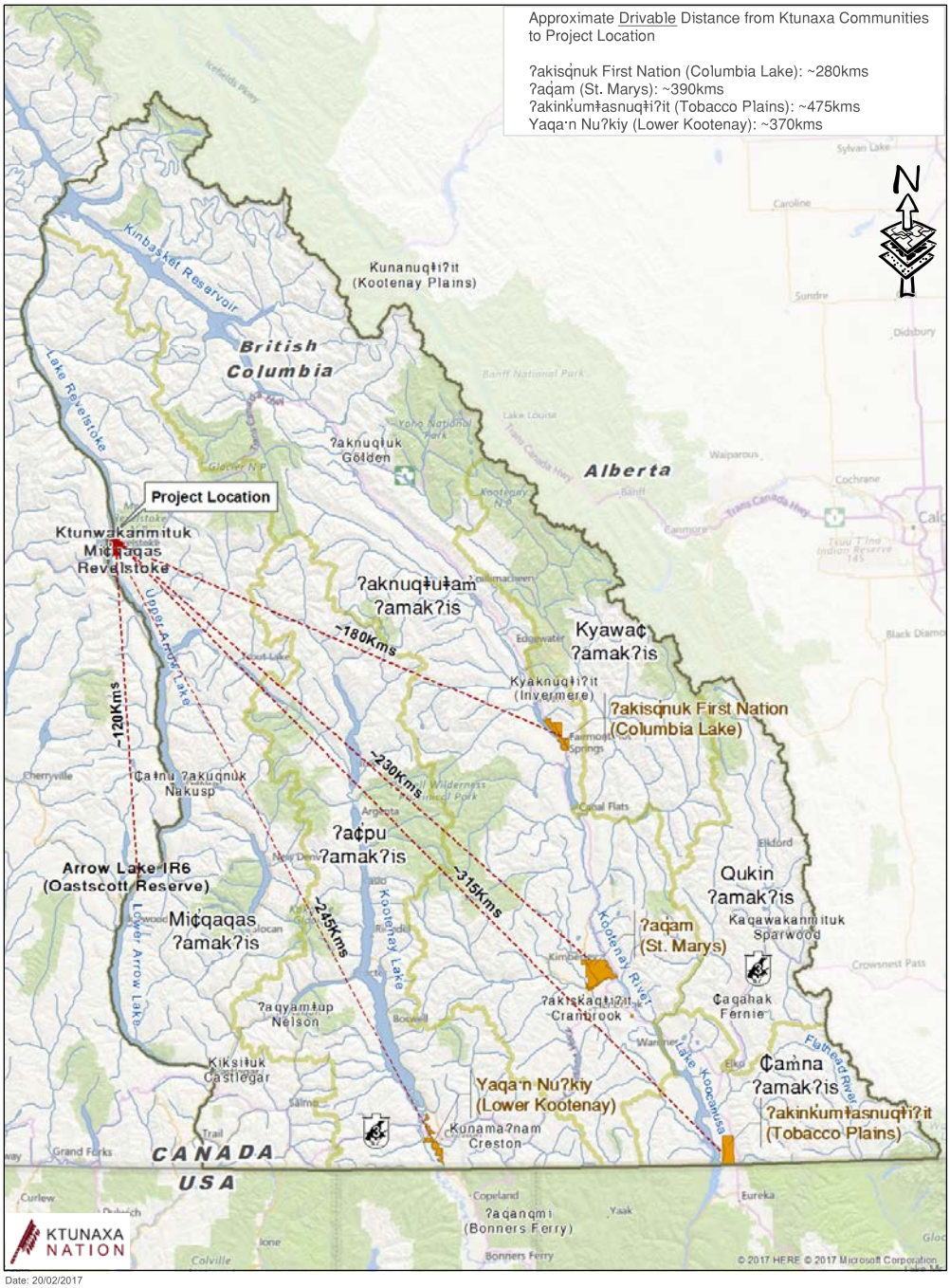
11.1.3 Maps of Traditional Territories

Maps of the asserted traditional territories of Schedule C Aboriginal groups are found in Figure 11-1, Figure 11-2 and Figure 11-3. Additional information on asserted traditional territories is provided in each Aboriginal group's respective Part C contributions.

11.1.4 Summary of Publicly Available Arrangements or Agreements between BC Hydro and Aboriginal Groups

BC Hydro has no publically available arrangements or agreements with First Nations with respect to the Project.

Figure 11-1 Traditional Territory Boundaries in Vicinity of the Revelstoke Dam and Generating Station – Ktunaxa Nation



Date: 20/02/2017

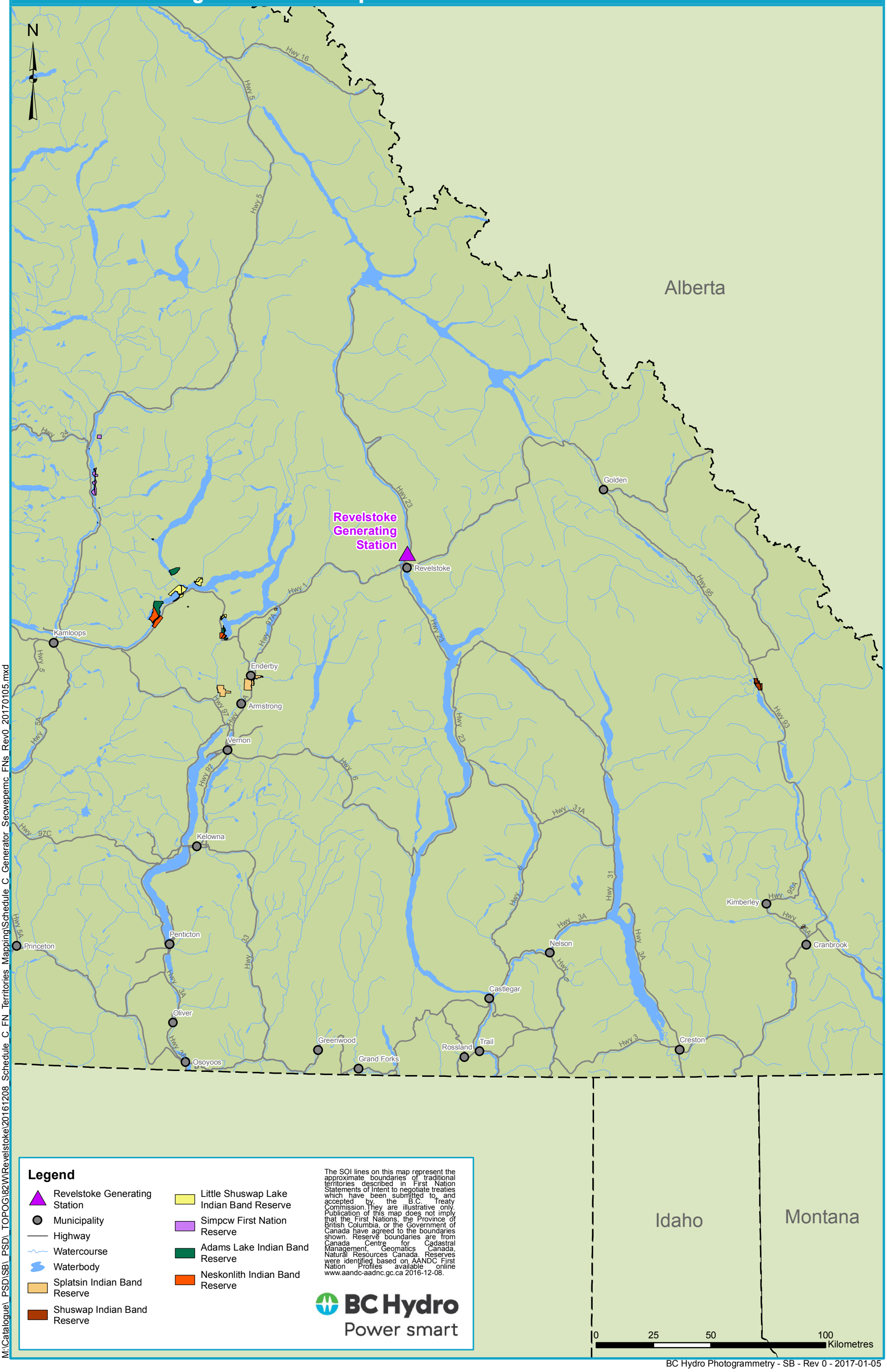
Ktunaxa Nation Communities Proximity (Kms) to Project Location

Ktunaxa ?amak?is within BC
Ktunaxa Traditional Districts
Ktunaxa Reserves

0 25 50 100
Kilometers

Mapping: JGaldamez, Ktunaxa Lands & Resources :: UTM Zone 11 - NAD83 :: Data Source: KNC, BC Baseline

Figure11-2 Traditional Territory Boundaries in Vicinity of the Revelstoke Dam and Generating Station – Secwepemc Bands



Legend

- Revelstoke Generating Station
- Municipality
- Highway
- Watercourse
- Waterbody
- Splatsin Indian Band Reserve
- Shuswap Indian Band Reserve
- Little Shuswap Lake Indian Band Reserve
- Simpcw First Nation Reserve
- Adams Lake Indian Band Reserve
- Neskonlith Indian Band Reserve

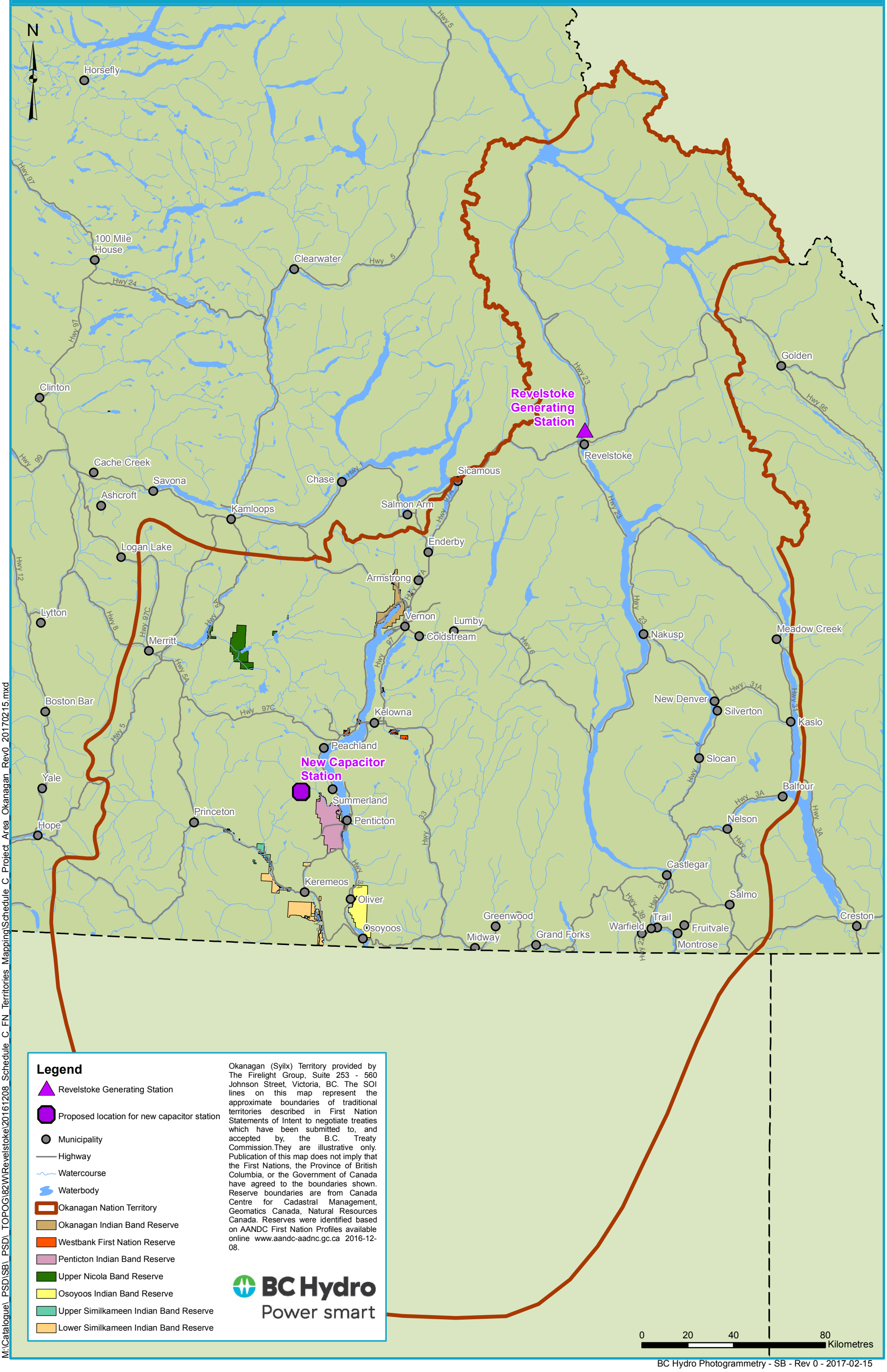
The SOI lines on this map represent the approximate boundaries of traditional territories described in First Nation Statements of Intent to negotiate treaties which have been submitted to, and accepted by, the B.C. Treaty Commission. They are illustrative only. Publication of this map does not imply that the First Nations, the Province of British Columbia, or the Government of Canada have agreed to the boundaries shown. Reserve boundaries are from Canada Centre for Cadastral Management, Geomatics Canada, Natural Resources Canada. Reserves were identified based on AANDC First Nation Profiles available online www.aandc-aadnc.gc.ca 2016-12-08.

BC Hydro
Power smart

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BC Hydro Photogrammetry - SB - Rev 0 - 2017-01-05

Figure 11-3: Okanagan Nation Territory in relation to the Project Area



Legend

- Revelstoke Generating Station
- Proposed location for new capacitor station
- Municipality
- Highway
- Watercourse
- Waterbody
- Okanagan Nation Territory
- Okanagan Indian Band Reserve
- Westbank First Nation Reserve
- Penticton Indian Band Reserve
- Upper Nicola Band Reserve
- Osoyoos Indian Band Reserve
- Upper Similkameen Indian Band Reserve
- Lower Similkameen Indian Band Reserve

Okanagan (Syilx) Territory provided by The Firelight Group, Suite 253 - 560 Johnson Street, Victoria, BC. The SOI lines on this map represent the approximate boundaries of traditional territories described in First Nation Statements of Intent to negotiate treaties which have been submitted to, and accepted by, the B.C. Treaty Commission.They are illustrative only. Publication of this map does not imply that the First Nations, the Province of British Columbia, or the Government of Canada have agreed to the boundaries shown. Reserve boundaries are from Canada Centre for Cadastral Management, Geomatics Canada, Natural Resources Canada. Reserves were identified based on AANDC First Nation Profiles available online www.aandc-aadnc.gc.ca 2016-12-08.

BC Hydro
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BC Hydro Photogrammetry - SB - Rev 0 - 2017-02-15

11.1.5 Past and Planned Consultation Activities

The remainder of this section provides a summary of consultation activities undertaken by BC Hydro with each of the Aboriginal Groups listed in Table 11-1, as required pursuant to Section 12 of the EAO Application Information Requirement guidelines. This summary describes consultation activities that took place between August 2012 and January 31, 2017 including meetings, phone calls, letters, and emails and consist of a high level description of key events followed by a chronological summary of the consultation process during the dates identified above. Additional details on BC Hydro's Consultation with Aboriginal groups are presented in the Aboriginal Consultation Report #1 and Aboriginal Consultation Report #2 (Appendix C-II).

In keeping with BC Hydro's principles of early and cooperative engagement, Project consultation with Aboriginal groups began in late 2012 before the issuance of the Section 11 Order (May 22, 2016). Throughout the course of consultation, Aboriginal groups have raised issues and concerns regarding potential Project effects and impact on Aboriginal interests. BC Hydro's process for tracking and responding to concerns expressed by Aboriginal groups includes maintaining a comprehensive log and data base of issues, concerns and interests identified by Aboriginal groups. A summary of these issues, concerns and interests, and BC Hydro's corresponding consideration and response is included as an appendix to the Aboriginal Consultation Report. Issues, concerns, and interests raised by Aboriginal groups have informed the selection of the Valued Components and Application Information Requirement (AIR) and have been considered in the development of Part B.

Following the issuance of the Section 11 Order, BC Hydro consulted in greater depth with Ktunaxa Nation Council, Okanagan Indian Band, West Bank First Nation, Okanagan Nation Alliance, Adams Lake Indian Band, Neskonlith Indian Band, Splatsin, Simpcw First Nation, Little Shuswap Lake Indian Band, and Shuswap Indian Band. In late 2014 and 2015, meetings were held with the Aboriginal groups to identify and establish preferred consultation and engagement processes. Each of the Schedule C First Nations established a joint working group with BC Hydro to review the Project and discuss the approach for the preparation of this Part C of the Application. Okanagan Nation requested a "parallel process" to address concerns over the sharing of confidential information at more public forums such as the Core Committee and Technical Task Group meetings, and to facilitate information sharing with members of their Revelstoke 6 Project Review Committee (PRC). To support the exchange of information, including confidential information, BC Hydro established individual SharePoint sites for each Aboriginal working group.

The Ktunaxa Nation, as represented by the Ktunaxa Nation Council, provided BC Hydro with a flow chart (Environmental Assessment - Pre-Application Process) illustrating their preferred consultation approach. This document has guided the engagement between BC Hydro and Ktunaxa Nation Council, including the approach to preparing Part C of the Application.

BC Hydro has negotiated Capacity Funding Agreements (CFA) to facilitate Aboriginal participation in the consultation process. As of January 2017, BC Hydro has made available approximately $3.2 million dollars in capacity funding to Aboriginal groups to engage on the Project. This includes, but is not limited to, funding to support traditional use studies (TUS), archaeological, culture and heritage studies, and socio-economic studies. BC Hydro is also working with Aboriginal groups to build capacity that will improve opportunities for Aboriginal individuals and business to benefit from Project activities.

11.1.6 Proposed Changes to the Aboriginal Consultation Plan

Aboriginal groups were provided with a copy of the Aboriginal Consultation Plan on January 22, 2016 and draft copies of the Aboriginal Consultation Report #1 (November 16, 2017) and Aboriginal Consultation Report #2 (January 26, 2017). Reviews of these documents by Aboriginal groups have not required any material changes to the Aboriginal Consultation Plan.

BC Hydro will continue to consult with Aboriginal groups in order to identify and consider outstanding issues throughout the environmental assessment process modifying approaches as required, to ensure consultation with Aboriginal groups is on accordance with the Aboriginal Consultation Plan.

11.1.7 Key Consultation Events

Key events in BC Hydro's consultation with Schedule C Aboriginal groups is summarized in Table 11-3.

Table 11-3: Aboriginal Consultation Key Activities

Aboriginal Consultation Key Activities		
Date	**Activities**	**Key Word**
2012, August	Provided Project notification letters to Aboriginal groups	Project Notification
2013, February 04	Project description sent to Aboriginal groups with notice of intent to submit project application to BC EAO	Project Description
2013, February 21	Provided Aboriginal groups the Scope of Work for Environmental and Socio- Economic Services	Environmental and Socio-Economic Services

Aboriginal Consultation Key Activities		
Date	**Activities**	**Key Word**
2013, November 20	First Core Committee Meeting in Revelstoke. Aboriginal groups invited to participate (representatives from Secwepemc, KNC)	Core Committee Meeting
2014, January 21/22	Environmental subcommittee meeting#1 (representatives Secwepemc, KNC)	Core Committee
2014, January 23	Community Sub -committee meeting #1 (representatives from Secwepemc, KNC)	Core Committee
2014, April 30	First Archaeology meeting (Technical Task Group) (representatives from Secwepemc, KNC, Okanagan)	TTG-Archaeology
2014, May 21/ 22	Environmental subcommittee meeting #2 (representatives from Secwepemc, KNC, Okanagan)	Core Committee
2014, July 21	Project fact sheet, cover letter, and backgrounder to VC were sent to Aboriginal groups in preparation for July 21 workshop	Valued Component Workshop
2014, July 23	First Valued Component (VC) workshop (Environmental subcommittee meeting#1)	Valued Component Workshop
2014, September	BC Hydro contracted Penticton Indian Band to conduct an archaeological impact assessment (AIA) for the proposed capacitor station	Capacitor Station
2015 January 23	Provided draft Application Information Requirement (dAIR) and draft Valued Components (dVC) to First Nations for review and input prior submission to BC EAO	dAIR and dVC
2015, March 5/6	BC Hydro held a Core Committee meeting that included a review of draft VC and AIR (representatives from Secwepemc, KNC, Okanagan)	Core Committee Meeting
2015, May 13/14	BC Hydro held a Core Committee meeting that included climate change, Columbia River Treaty, dAIR and draft VC Core Committee #3 (representatives from Secwepemc, KNC, Okanagan)	Core Committee Meeting
2015, May 22	BC EAO issued Section 11 Order	Section 11 Order
2015, June 21	Initial meeting to establish the Aboriginal Advisory Group for the salmon restoration study	Salmon Restoration
2015, June 25	Hydro Technical Geophysical #1 TTG meeting (representatives from Secwepemc, KNC, Okanagan)	Workshop
2015, July 21	Aboriginal Advisory Group conference call to develop the scope of work for the salmon restoration study	Salmon Restoration
2015, August 7	Aboriginal Advisory Group conference call to review the RFP for the salmon restoration study	Salmon Restoration
2015, September	BC Hydro hosted Part C Collaborative Writing Workshop	Workshop
2015, September 30	Fish and Aquatics #1(representatives from Secwepemc, KNC, Okanagan)	Workshop

Aboriginal Consultation Key Activities		
Date	**Activities**	**Key Word**
2015, October 01	Terrestrial TTG#1 meeting (representatives from Secwepemc, KNC, Okanagan)	Workshop
2015, November 18	Hydro Technical Geophysical# 2 TTG meeting (representatives from Secwepemc, KNC)	Workshop
2015, November 18	Fish and Aquatics #2 meeting (representatives from Secwepemc, KNC, Okanagan)	Workshop
2015, November 19	Archaeology TTG #1(representatives from Secwepemc, KNC,)	Workshop
2016, January 20	BC Hydro provided 1st draft of Part B of the Environmental Assessment Application to Schedule C listed Aboriginal Groups	Draft Environmental Assessment
2016, February 22	Aboriginal Advisory Group salmon restoration study conference call to review draft R2 report	Salmon Restoration
2016, March 10	BC Hydro submitted the revised Aboriginal Consultation Plan and accepted by BC EAO	Aboriginal Consultation Plan
2016, April 13	Terrestrial TTG#2 meeting (representatives from Secwepemc, KNC, Okanagan)	Workshop
2016, April 15	Fish and Aquatics #3 meeting (representatives from Secwepemc, KNC, Okanagan)	Workshop
2016, April 28	Archaeology – meeting to select archaeological potential modelling (timing, permitting, terms of reference, selection of consultants)	Archaeology
2016, May 3	Archaeology - meeting to discuss selected consultant (Millenia) approach to the archaeological potential modelling.	Archaeology
2016, May 10	Archaeology – meeting to review Millenia potential modelling workplan.	Archaeology
2016, May 12	Archaeology – follow up meeting to review Millenia potential modelling workplan.	Archaeology
2016, July 28	Archaeology – conference call to review workplan and schedule field work, including follow up and ground truthing.	Archaeology
2016, July 29	BC Hydro provided copy of the second Draft Part B of the Application, a summary of REV5 study findings, and Comment Tracking Table to Aboriginal groups listed on Schedule C.	EA Application
2016, September 14	Hydro Technical Geophysical #3 TTG meeting (representatives from Secwepemc, KNC, Okanagan)	Workshop
2016 September 15	Archaeology TTG #2 meeting (representatives from Secwepemc, KNC, Okanagan)	Workshop
2016, September 16	Terrestrial TTG#3 meeting (representatives from Secwepemc, KNC, Okanagan)	Workshop

Aboriginal Consultation Key Activities		
Date	**Activities**	**Key Word**
2016, October 3-7	Archaeology – field program	Archaeology
2016, October 04	Fish and Aquatics #4 meeting (representatives from KNC, Okanagan)	Workshop
2016, October 05	Assessment Question/Answer TTG meeting (representation KNC/Okanagan)	Workshop
2016, October 11-15	Archaeology – field program	Archaeology
2016, October 18	Presentation of the EA results ((representatives from KNC, Okanagan)	Workshop
2016, November 08	Archaeology TTG #3 meeting (representatives from Secwepemc , KNC, Okanagan)	Workshop
2016, November 16	BC Hydro provided draft Aboriginal Consultation Report #1 to Aboriginal groups listed on Schedule C	Aboriginal Consultation Report 1
2016, December 01	BC Hydro provided a summary of draft assessment results, and Q/A and documented member's views for final Core Committee report (representatives from Secwepemc, KNC, Okanagan)	Workshop
2017, January 27	BC Hydro provided draft Aboriginal Consultation Report #2 to Aboriginal groups listed on Schedule C	Aboriginal Consultation Report 2

11.1.7.1 *Chronology of Events : Ktunaxa Nation*

Chronology of Events Ktunaxa Nation Council (KNC) 2012-2013	
Date	**Event**
15 August 2012	• BC Hydro notified Ktunaxa nation Council (KNC) of its intent to submit an Application for an Environmental Certificate to BC EAO
4 February 2013	• BC Hydro distributed Project description to all KNC
21 February 2013	• BC Hydro provided all KNC with a copy of the Scope of Work for Environmental and Socio-Economic Services for comments
30 October 2013	• BC Hydro extended an invitation to KNC to participate in the Project Core Committee process. Core Committee and Technical Task Group for Project were created to act as a forum for open dialogue and the sharing of technical information
14 November 2013	• BC Hydro circulated the draft Terms of Reference and Code of Conduct for the Core Committee engagement process to KNC for their review and comments

Chronology of Events Ktunaxa Nation Council (KNC) 2012-2013	
Date	**Event**
20 November 2013	• November 20, KNC accepted an invitation to become a member of the Project Core Committee
20/21 November 2013	• KNC representatives attended the first Core Committee meeting where the meeting objectives were to provide a project overview, to verify committee membership, terms of reference and code of conduct, and, to confirm or identify interests and issues for the Project

Chronology of Events Ktunaxa Nation Council (KNC) 2014	
Date	**Event**
21/ 22 January	• KNC representatives attended the first Environment Sub-Committee meeting hosted at Revelstoke with the purpose of reviewing the BC Environmental Assessment process, selection of Valued Components, and the scope of cumulative effects assessment under the BCEAO process
23 January	• KNC representatives attended the first Community Sub-committee meeting
14 February	• KNC and BC Hydro signed an interim Capacity Funding Agreement
30 April	• KNC representatives attended first Archaeology meeting (Technical Task Group)
06 May	• KNC received copies of the Wind and Wave Erosion Heritage studies for work in Arrows Lake
21/22 May	• KNC representatives attended the second environmental Sub-Committee meeting, which included a site visit to the Mid-Columbia River
21July	• BC Hydro circulated a Project fact sheet, Project reference list, Rev 6 CC issues and backgrounder on VC in preparation for the VC workshop on July 23
23 July	• KNC representatives attended the first Valued Component (VC) workshop held by BC Hydro. Presentations were made outlining the EA process and in particular the identification of potential Valued Components

Chronology of Events Ktunaxa Nation Council (KNC) 2015	
Date	**Event**
13 January	• KNC and BC Hydro agreed to amend the Interim Capacity Funding on, to continue consultation with regards to the Project
23 January	• KNC was provided a draft Application Information Requirement (dAIR) and draft Valued Components (dVC) to First Nations for review and input prior submission to BC EAO
18 February	• KNC provided a written response to the candidate VCs
5/6 March	• BC Hydro held a Core Committee meeting and presented the draft Application Information Requirements (dAIR) as well as Valued Component (VC) documents to KNC for review prior to submission to the BCEAO
06 March	• KNC provided BC Hydro with an EA Section C flow chart identifying their preferred approach to writing Part C
25 March	• KNC and BC Hydro signed a Capacity Funding Agreement (CFA)
15 April	• KNC provided BC Hydro with a draft Table of Contents for their Part C contribution.

Chronology of Events Ktunaxa Nation Council (KNC) 2015	
Date	**Event**
April 20	• KNC provided a memo responding to the dAIR, and also a proposed table of content for Part C
25 April	• Conference call between KNC and BC Hydro Subject Matter Expert (SME) Discussion of Geophysical Intermediate Components Power Point
27 April	• BC Hydro sent KNC draft Terms of Reference for writing Part C for KNC review and comments
13/14 May	• KNC representatives attended Core Committee meeting that included climate change, Columbia River Treaty, dAIR and draft VC Core Committee #3
20 May	• BC Hydro and KNC finalized the terms of reference for writing Part C
27 May	• KNC provided BC Hydro with their comments on the draft AIR and Value Components
21 June	• KNC representatives participated in the initial meeting to establish the Aboriginal Advisory Group for the salmon restoration study
25 June	• KNC representatives participated in the initial Hydro Technical Geophysical #1 TTG
26 June	• KNC provided comments and notes to the draft Terms of Reference, and identified schedule and timelines to complete writing Part C
17 July	• KNC representatives attended a conference call with fish and aquatic representatives to discuss scope of work and consultants for the Salmon Restoration study
21 July	• KNC representatives participated in initial meeting to establish Aboriginal Advisory Group for the Salmon Restoration Study
5 August	• The Project SharePoint site was established for KNC to facilitate information sharing
07 August	• KNC representatives participated in the Aboriginal Advisory Group conference call to review the RFP for the salmon restoration study
10 September	• KNC representatives attended a workshop on Collaborative Writing of Part C on EA Application hosted by BC Hydro
23 September	• BC Hydro/KNC conference call to discuss KNC preferred approach and experience in writing Part C of an EA
28 September	• KNC/BC Hydro conference call to discuss consultants proposed work plan for Part C
30 September	• KNC representatives attended the Fish and Aquatics #1TTG
01 October	• KNC representatives attended the Terrestrial TTG#1
18-19 November	• KNC representatives attended Hydro Technical Geophysical# 2 TTG and Fish and Aquatics #2 TTG

Chronology of Events Ktunaxa Nation Council (KNC) 2016	
Date	**Event**
19 January	• BC Hydro/KNC conference call to discuss the Project assessment methodology and in particular, cumulative effects assessment
20 January	• BC Hydro provided 1st draft of Part B of the Environmental Assessment Application to KNC
25 January	• BC Hydro provided Aboriginal Consultation Plan to KNC for review and since no comments were received, the Aboriginal Consultation Plan was submitted to the BCEAO on March 15
22 February	• KNC representatives participated in the Salmon Restoration conference call to review draft R2 report
3 March	• KNC/BC Hydro signed an amending agreement to provide KNC with additional capacity to participate in consultations related to the Project's Environmental Assessment
9/10March	• KNC and BC Hydro meeting regarding baselines for socio-ec and cumulative effects (Cranbrook)
22 March	• KNC provided comments on BC Hydro/ Golder March 9 presentation: socioeconomic assessment and cumulative effects
13 April	• KNC representatives attended the Terrestrial TTG#2
15 April	• KNC representatives attended the Fish and Aquatics TTG #3
28 April	• KNC representatives participated in the Archaeology conference call to select archaeological potential modelling (timing, permitting, terms of reference, selection of consultants)
3 May	• KNC representatives participated in the Archaeology conference call to discuss selected consultant (Millenia) approach to the archaeological potential modelling
10 May	• KNC representatives participated in the Archaeology conference call to review Millenia potential modelling work plan
12 May	• KNC representatives participated in the Archaeology conference call to review Millenia potential modelling work plan comments and determine next steps
22 May	• KNC provided BC Hydro with a memo on their response to the March 9/10th Golder presentation on socio economic baseline and BC Hydro's presentation on cumulative effects methodology
27 July	• BC Hydro provided 2nd draft of Environmental Assessment Application, and Rev 5 studies to KNC
28 July	• KNC representatives participated in the Archaeology conference call to review the work plan and schedule field work, including follow up and ground truthing
12 September	• BC Hydro provided a second draft of the dAIR and dVC to KNC for further review
14-16 September	• KNC representatives attended the Hydro Technical Geophysical #3 TTG, Archaeology TTG #2, Terrestrial TTG#3
29 September	• BC Hydro received KNC perspective report on the Revelstoke 6 EA Valued Components (VC) for inclusion in Part B of the Application
01 October	• KNC provided BC Hydro with a technical memorandum addressing KNC concerns regarding the draft baseline and assessment methodology
04 October	• KNC representatives attended the Fish and Aquatics TTG #4
5 October	• KNC representatives attended the BC Hydro Project Q&A session. KNC representatives made a presentation on water as a VC

Chronology of Events Ktunaxa Nation Council (KNC) 2016	
Date	**Event**
18 October	• KNC representatives participated in the Technical Task Group workshop on mitigation and monitoring measures for socio-economic
08 November	• KNC representatives participated in the Archaeology TTG #3
16 November	• BC Hydro provided the draft Aboriginal Consultation Report #1 to KNC, for their review and comments
01 December	• KNC representatives participated in the Q&A meetings where a summary of draft assessment results was presented by BC Hydro

Chronology of Events Ktunaxa Nation Council (KNC) 2017	
Date	**Event**
27 January	• BC Hydro circulated draft Aboriginal Consultation Report #2 to KNC that contains additional comments and issues raised by KNC since the submission of Aboriginal Consultation Report #1 to BCEAO

11.1.7.2 *Chronology of Events: Okanagan Nation*

Chronology of Events Okanagan 2012-2013	
Date	**Event**
15 August 2012	• BC Hydro notified Okanagan Nations of its intent to submit an Application for an Environmental Certificate to BC EAO
4 February 2013	• BC Hydro distributed Project description to all Okanagan bands and ONA
21 February 2013	• BC Hydro provided all Okanagan bands and ONA with a copy of the Scope of Work for Environmental and Socio- Economic Services for comments
30 October 2013	• BC Hydro extended an invitation to Okanagan bands to participate in the Project Core Committee process. Core Committee and Technical Task Group for Project were created to act as a forum for open dialogue and the sharing of technical information
14 November 2013	• BC Hydro circulated the draft Terms of Reference and Code of Conduct for the Core Committee engagement process to Okanagan bands and ONA for their review and comments

Chronology of Events Okanagan 2014	
Date	**Event**
13 March	• ONA and PIB confirmed their interest by email in participating in the Project, and agreed to participate in a consultation process with BC Hydro.
30 April	• Okanagan Indian Band and West Bank First Nation representatives attended a BC Hydro sponsored First Nation archaeology workshop to review past archaeology work that had been undertaken in the vicinity of Revelstoke Reservoir and the mid-Columbia reach as well as to explain the current studies that were on going in the region.
12 May	• BC Hydro invited PIB field technicians to participate in 21-25 May archaeological field program at the Proposed Capacitor Station.
21 May	• Representative from OKIB and West Bank along with representatives from other Schedule C Nations attended the second environmental Sub-Committee meeting, which was also a site visit to Mid-Columbia River.
22 May	• WFN sent BC Hydro letter confirming their interest in participating in the REV6 Project.
4/5 June	• ONA and PIB attended a site visit with SNC and BC Hydro to the Proposed Capacitor Station.
16 July	• ONA received interim capacity funding.
19 July	• Project fact sheet, cover letter, and backgrounder to VC were sent to OKIB, PIB, WFN in preparation for VC workshop.
23 July	• Representatives from WFN and OKIB attended the Environmental Sub-committee meeting – VC Workshop.
14 September	• BC Hydro contracted PIB to conduct an archaeological impact assessment (AIA) for the proposed capacitor station.
9 October	• Conference call with WFN to discuss capacity funding and concerns with the Project assessment approach.
30 October	• Letter from WFN to BC Hydro outlining their response to the candidate VC and the need for more First Nation involvement in baseline studies.
23 December	• BC Hydro received an e-mail from WFN expressing concerns about the Core Committee process, and the need for funding for independent studies. WFN also raised concerns over outcomes of previous WUP studies.

Chronology of Events Okanagan 2015	
Date	**Event**
19 January	• Conference call with ONA to discuss the REV6 EAC Application process and how ON would like to participate.
22 January	• Conference call with ONA to discuss selection of Valued Components and EAC Application timelines.
26 January	• BC Hydro provided ONA, OKIB, WFN and PIB with the draft Application Information Review and draft Valued Component for review and input prior to submission to the BCEAO.

Chronology of Events Okanagan 2015	
Date	**Event**
24 February	• BC Hydro meeting with representatives of ONA, OKIB, WFN, and PIB to review the EA methodology, and in particular the findings of REV5 project-related studies.
5/6 March	• Representatives of ONA, OKIB, and Westbank attended the Core Committee meeting that included a review of draft VC and AIR.
10 March	• BC Hydro meeting with ONA, OKIB, WFN, and PIB to discuss REV6 Project generally and Okanagan Nation concerns about gaps in baseline information and Rev 5 studies.
17 April	• BC Hydro and Penticton Indian Band entered into CCFA to support their participation in the EA process.
24 April	• BC EAO issued the draft Section 11 Order for the Project.
5/6 March	• BC Hydro and ONA representatives attended Core Committee meeting (Revelstoke).
8 May	• Westbank First Nation expressed their interest to participate in each of the Technical Task Groups and requested capacity funding to support a higher level of participation.
13/14 May	• OKIB, Westbank and ONA representatives attended a Core Committee meeting (3#) that included discussions on climate change, Columbia River Treaty, dAIR and draft VC.
14 May	• ON sent a letter to BC Hydro expressing the Nation's concern with the Environmental Assessment Application process and their withdrawal from the discussions on VCs and a request to establish a separate, parallel, engagement process that will ensure the views, concerns, and interest of ON are properly considered and presented within the Application.
21 May	• BC Hydro wrote a response letter acknowledging ONA concerns and agreed to establish a separate process.
29 May	• BC Hydro conference call with WFN to discuss REV6 work plans and WFN. participation in EA process and capacity funding.
11 June	• Revelstoke 6 Project SharePoint site was established for ON to facilitate information sharing.
21 June	• PIB,OKIB, and ONA representatives participated in the initial conference call to establish the Aboriginal Advisory Group for the salmon restoration study.
25 June	• WFN and OKIB representatives participated in the Hydro Technical Geophysical #1 TTG meeting.
20 July	• BC Hydro conference call with ONA to discuss capacity funding budgets and work plans for ON participation in EA process including the writing of Part C.
21 July	• OKIB and WFN representatives attended the BC Hydro conference call to develop the scope of work for the salmon restoration study. OKIB and WFN agreed to participate in a Steering Committee with members from all Schedule C listed Aboriginal group.
24 July	• BC Hydro and Westbank First Nation signed Interim Capacity Funding Agreement.
07 August	• OKIB, WFN and ONA participated in the Aboriginal Advisory Group conference call to review the RFP for the salmon restoration study.
13 August	• BC Hydro approved funding for WFN, PIB, ONA, and OKIB representatives to visit the Project site.

Chronology of Events Okanagan 2015	
Date	**Event**
17/18 August	• ONA, WFN, OKIB, and PIB representatives conducted a site visit to Revelstoke to begin development of the Okanagan Nation submission for Section C of the BC EA. The group attended a Revelstoke Dam tour on 17 August, and visited the village site on the west side of the Highway 1 Bridge on 18 August.
10 September	• WFN and OKIB attended a workshop on the collaborative writing of Part C of EAC Application hosted by BC Hydro in Kelowna.
15 September	• BC Hydro/ON conference call to discuss the status of the dAIR and dVC documents.
28 September	• Representatives of OKIB, WFN, and PIB participated in the conference call to review the R2 proposal for the salmon restoration study.
30 September	• Representatives of OKIB, ONA, and WFN, participated in the Fish and Aquatics TTG #1 meeting (Revelstoke).
01 October	• Representatives of OKIB, ONA, and WFN, participated in the Terrestrial TTG#1 meeting (Revelstoke).
8 October	• BC Hydro met with representatives of ONA, WFN, OKIB and PIB to discuss the establishment of the "parallel process" and the role of the Revelstoke 6 Project Review Committee (PRC) led by OKIB (Vernon).
30 October	• BC Hydro conference call with ON to discuss the status of the Capacity Funding Agreements.
4 November	• BC Hydro met with the PRC lead, OKIB to review Capacity Funding Agreements and discuss work plan, including revisions to the REV6 EA schedule.
5 November	• BC Hydro met with WFN representatives to review Capacity Funding Agreements and discuss work plan, including revisions to the REV6 EA schedule.
23/24 November	• BC Hydro attended a PRC meeting. BC Hydro Subject Matter Experts (SMEs) made presentation to the PRC on Valued Components, baseline of assessment, EA methodology, hydrology, and BC Hydro's operations.
12 December	• ONA Energy Executive Council (EEC) meeting in Vancouver, BC Hydro provided a presentation on Project status to EEC leadership.

Chronology of Events Okanagan 2016	
Date	**Event**
20 January	• BC Hydro conference call with PIB to address capacity funding, PRC participation, baseline cumulative effects workshop, and the salmon restoration study.
20 January	• BC Hydro provided 1st draft of Part B of the Environmental Assessment Application to Okanagan Schedule C bands.
26 January	• BC Hydro provided the draft Aboriginal Consultation Plan to OKIB, WFN, ONA and PIB for their review and comment and since no comments were received, the Aboriginal Consultation Plan was submitted to the BCEAO on March 15.
27 January	• BC Hydro meeting with OKIB to review work plan and budgets (Vernon).

Chronology of Events Okanagan 2016	
Date	**Event**
10 February	• BC Hydro initial meeting with ON Project Manager to discuss the Project schedule workplan and Part C authorship.
15 February	• BC Hydro and OKIB signed a funding agreement for the PRC PM position.
22 February	• ONA, WFN, and OKIB representatives attended the Salmon Restoration, Study conference call.
25 February	• BC Hydro met with ON PRC to discuss Socio-Economic assessment, including a presentation from Golder Associates on behalf of BC Hydro.
27 February	• BC Hydro conference call with OKIB, WFN, PIB, and other Schedule C Aboriginal groups to discuss the results of the salmon restoration study.
3 March	• BC Hydro meeting with the ON Project Manager to review and address outstanding issues from the 25 February Socio-Economic meeting.
April 13	• OKIB, WFN participated in the Terrestrial TTG#2 meetings.
April 15	• OKIB, WFN participated in the Fish and Aquatics TTG#3 meetings.
22 April	• BC Hydro provided additional funding to cover for Project Manager position to assist OKIB in its lead consultation role on behalf of the Okanagan Nation in respect of the Revelstoke 6 Project.
28 April	• OKIB, WFN participated in the Archaeology conference call to select archaeological potential modelling (timing, permitting, terms of reference, selection of consultants)
3 May	• BC Hydro meeting with PIB Chief Kruger to provide an update on the REV6 Project, and status of work plans.
10 May	• OKIB, WFN participated in the Archaeology conference call to review Millenia potential modelling work plan.
24 June	• BC Hydro and OKIB signed an interim CFA.
28 July	• OKIB, WFN participated in the Archaeology conference call to review work plan and schedule field work, including follow up and ground truthing.
29 July	• BC Hydro provided 2nd draft of Environmental Assessment Application, and Rev 5 studies to PRC.
12 September	• BC Hydro provided a second draft of the dAIR and dVC to ON for further review.
14 -16 September	• OKIB, WFN attended the Hydro Technical Geophysical #3 TTG, Archaeology TTG #2, and Terrestrial TTG#3 meetings (Revelstoke).
04 October	• PM for ON attended the Fish and Aquatics #4 TTG meeting (Revelstoke).
18 October	• A Technical Task Group workshop on mitigation and monitoring measures for socio-economic impacts was also held and attended by ON.
November 8	• PM for ON attended Archaeology TTG #3 meeting (Revelstoke).
16 November	• BC Hydro circulated draft Aboriginal Consultation Report #1 to ONA, PIB, OKIB, and WFN.
1 December	• ON Project Manager attended the last Core Committee meeting (#4) (Revelstoke).

Chronology of Events Okanagan 2016	
Date	**Event**
12 December	• BC Hydro representatives attended an OKIB open house on BC Hydro Projects including REV6.
15 December	• ON provided BC Hydro a draft Part C document. • BC Hydro received a request from WFN for funding to undertake a socio-economic study.

Chronology of Events Okanagan 2017	
Date	**Event**
4 January	• BC Hydro received a request from PIB for funding to undertake a socio-economic study.
5 January	• BC Hydro and OKIB discussed approaches to finalizing mitigation and monitoring measures through an email.
27 January	• BC Hydro circulated draft Aboriginal Consultation Report #2 to ONA, OKIB, WFN and PIB.
30 January	• PM for PRC noted errors in the asserted traditional territory map for Okanagan Nation and provided an updated map on February 15.
2 February	• February 2. BC Hydro and WFN signed a funding agreement to support WFN past and continued participation with the Project Review Committee (PRC).
14 February	• OKIB, on behalf of ON, submitted the Okanagan Nation Part C document.

11.1.7.3 *Chronology of Events: Secwepemc*

Chronology of Events Secwepemc 2012-2013	
Date	**Event**
15th August 2012	• BC Hydro notified all Secwepemc bands of its intent to submit an Application for an Environmental Certificate to BC EAO.
4 February 2013	• BC Hydro distributed Project description to all Secwepemc bands.
21 February 2013	• BC Hydro provided all Secwepemc bands with a copy of the Scope of Work for Environmental and Socio- Economic Services for comments.
30 October 2013	• BC Hydro extended an invitation to all Secwepemc bands to participate in the Project Core Committee process. Core Committee and Technical Task Group for Project were created to act as a forum for open dialogue and the sharing of technical information.
14 November 2013	• BC Hydro circulated the draft Terms of Reference and Code of Conduct for the Core Committee engagement process to all Secwepemc bands for their review and comments.
20 November 2013	• Secwepemc representatives attended the first Core Committee meeting (Revelstoke).

Chronology of Events Secwepemc 2014	
Date	**Event**
21/22/23 January	• Secwepemc representatives attended the first Environment Sub-Committee meeting hosted at Revelstoke with the purpose of reviewing the BC Environmental Assessment process, selection of Valued Components, and the scope of cumulative effects assessment under the BC EA process.
30 April	• Secwepemc representatives attended a First Nation archaeology workshop to review past archaeology work that had been undertaken in the vicinity of Revelstoke Reservoir and the mid-Columbia reach as well as to explain the current studies that were on going in the region.
21/22 May	• Secwepemc band representatives attended the second environmental Sub-Committee meeting which was also a site visit to Mid-Columbia River.
23 July	• Secwepemc band representatives attended the first Valued Component (VC) workshop held by BC Hydro. Presentations were made outlining the EA process and in particular the identification of potential Valued Components.
8 October	• BC Hydro met with representatives of Shuswap Indian Band, Simpcw First Nation, Little Shuswap Lake Indian Band, and Sexqeltkemc te Sepwepemc (Splatsin, Adams Lake Indian Band, Neskonlith (STS)) to discuss and review the proposed Valued Components. • Shuswap Indian Band, Simpcw First Nation, Little Shuswap Lake Indian Band, and the STS advised BC Hydro that they had formed a technical working group Secwepemc Technical Working Group (STWG) to carry out certain Project consultation activities and participate in the EA process. BC Hydro accepted the invitation to become a standing member of the STWG.
Oct 28	• Conference call with representatives from Splatisn, Neskonlith, and Adams Lake (STS) and BC Hydro to discuss Project capacity funding.
31 Oct	• Meeting between BC Hydro and STS to discuss Project work plan and roles (Enderby).

Chronology of Events Secwepemc 2015	
Date	**Event**
23 January	• BC Hydro provided the draft Application Information Requirements (dAIR) to Secwepemc Schedule C bands for review and input prior to submission to the BCEAO.
11 February	• BC Hydro sent an email note agreeing to provide interim capacity funding to Little Shuswap Lake Indian Band.
5 March	• BC Hydro and Sexqeltkemc te Sepwepemc (STS), comprised of Adams Lake Indian Band, Neskonlith Indian Band and Splatsin, entered into a Capacity Funding Agreement to support their participation in Environmental Assessment Process.
5/6 March	• STWG representatives attended the Core Committee meeting that included a review of draft VC and dAIR.
23 March	• STWG follow up meeting to discuss issues related to dAIR and VC (Enderby).
25 March	• STWG provided BC Hydro with their written responses to the dAIR with specific comments regarding cultural heritage VC from Shuswap Indian Band and Splatsin.
13 April	• BC Hydro and Shuswap Indian Band signed a consultation Capacity Funding Agreement.

Chronology of Events Secwepemc 2015	
Date	**Event**
21 April	• STWG meeting to discuss the collaborative process for writing of Part C. STWG provided a draft table of contents for discussion (Enderby).
24 April	• BC EAO issued the draft Section 11 Order for the Project.
13 May	• BC Hydro meeting with Secwepemc and KNC representatives to discuss Part C framework and processes (Revelstoke).
13/14 May	• STWG representatives attended the Core Committee#3 TTG meeting that included discussions on climate change, Columbia River Treaty, dAIR and draft VC.
21 May	• BC Hydro received the proposal and draft budget for Secwepemc Working Group through email.
22 May	• BC Hydro and Simpcw signed a Capacity Funding Agreement.
26 May	• BC Hydro /STWG conference call to discuss proposed Project budget and work plan.
01 June	• BC Hydro and STWG meeting to review status of the EA, finalize budgets, determine consultant, and roles and responsibilities for Part C (Salmon Arm).
15 June	• BC Hydro received from STWG information on Part C, project manager (PM) position, revised project timelines and research budget.
19 June	• BC Hydro received a signed CFA from Little Shuswap Indian Band.
21 June	• STWG representatives participated in the conference call to establish the Aboriginal Advisory Group for the salmon restoration study.
25 June	• STWG representatives attended the Hydro Technical Geophysical #1 TTG meeting (Revelstoke).
02 July	• Conference call between BC Hydro and STWG representatives to discuss budgets, work plans, and Part C drafting.
3 July	• BC Hydro and Little Shuswap Lake Indian Band entered into a Consultation and Capacity Funding Agreement.
13 July	• STWG meeting to draft a protocol to support the development of BC Hydro and Secwepemc Collaborative Agreement. • STWG provided BC Hydro with the Project PM community tour schedule.
21 July	• BC Hydro advised STWG that SNC was assessing the VC for the Project and would appreciate receiving information about traditional use within the Project Area.
17 July	• STWG representative attended the initial salmon restoration conference call to discuss the scope of the study and the proposed approach to undertaking the study.
21 July	• STWG representatives attended the second call on salmon restoration to discuss potential consultants qualified to undertake the work and the RFP process and next steps.
22 July	• Splatsin identified TUS documents that could be used to inform the VC assessment.
22 July	• BC Hydro and Simpcw entered into a Capacity Funding Agreement.
23 July	• BC Hydro advised STWG that the Secwepemc SharePoint site had been established.

Chronology of Events Secwepemc 2015	
Date	**Event**
25 July	• Representatives of STWG attended the conference call to discuss the proposed restoration salmon study.
29 July	• BC Hydro/STWG conference call to review status of Project and draft terms of reference for Collaboration Agreement.
04 August	• Representatives of STWG participated in a salmon restoration conference call to discuss the goal and scope of the study including the working definition of “salmon restoration” for the purpose of the study and discussion of why Fish Resources is a VC and salmon is not being considered a VC.
5 August	• BC Hydro/STWG conference call to discuss the proposed Part C content and work plan and to discuss recent changes to the section proposed by the BC EAO.
07 August	• Representatives of STWG participated in the Aboriginal Advisory Group conference call to review the RFP for the salmon restoration study.
30 August	• STWG provided BC Hydro with a cultural and heritage funding proposal for discussion.
10 September	• STWG representatives attended a workshop on collaborative writing of Part C on EA Application hosted by BC Hydro.
18 September	• BC Hydro and Shuswap Indian Band amended the CFA to support the hiring of a Project Manager and to support initial engagement of a consultant to undertake a Traditional Use gap analysis.
28 September	• STWG representatives attended a conference call to review the consultant proposal for the salmon restoration study.
30 September	• STWG representatives participated in the Aboriginal Advisory Group conference call to review the RFP for the salmon restoration study.
01 October	• STWG representatives attended the Terrestrial TTG#1 meeting (Revelstoke).
14 October	• BC Hydro/ STWG meeting to review project status and TUS work (Tappen Hall).
18/19 November	• STWG representatives attended the Hydro Technical Geophysical # 2 TTG, Fish and Aquatics #2, and Archaeology TTG #1 meetings (Revelstoke).
27 November	• BC Hydro/STWG teleconference to review Part C status, and cultural heritage proposal.

Chronology of Events Secwepemc 2016	
Date	**Event**
20 January	• BC Hydro provided 1st draft of Part B of the Environmental Assessment Application to Secwepemc Schedule C bands.
26 January	• BC Hydro provided Aboriginal Consultation Plan to all Secwepemc bands for review and since no comments were received, the Aboriginal Consultation Plan was submitted to the BC Environmental Assessment Office on March 15, 2016.
22 February	• BC Hydro provided STWG with copies of the revised socio-economic assessment report with the inclusion of cumulative effects assessment and a Technical Memo outlining socio-economic information to assist the STWG in writing Part C.

Chronology of Events Secwepemc 2016	
Date	**Event**
02 March	• BC Hydro/STWG meeting to review cultural heritage proposal, funding, and Project issues (Enderby).
18 March	• BC Hydro advised STWG that the Salmon Restoration study report had been uploaded to the STWG SharePoint site.
13 April	• STWG representatives attended the Terrestrial TTG#2 meeting (Revelstoke).
15 April	• STWG representatives attended the Fish and Aquatics TTG #3 meeting (Revelstoke).
20h April	• STWG were advised by email that Archaeological Erosion Modelling results indicated potential effects in some sites in the MCR.
21 April	• BC Hydro/STWG conference call to discuss the preferred approach for the collaborative writing of Part C in the Environmental Assessment Application.
28 April	• STWG representatives participated in the archaeology meeting to select archaeological potential modelling (timing, permitting, terms of reference, selection of consultants).
03 May	• STWG representatives participated in the archaeology meeting to discuss selected consultant (Millenia) approach to the archaeological potential modelling.
10 May	• STWG representatives participated in the archaeology meeting to review Millenia potential modelling work plan.
12 May	• STWG representatives participated in the archaeology meeting to follow up meeting to review Millenia potential modelling work plan.
10 June	• BC Hydro/STWG meeting to discuss capacity funding, dAIR, and Part C. Agreement was reached on funding amendments (SNTC Kamloops).
28 July	• STWG representatives participated in the archaeology meeting to review work plan and schedule field work, including follow up and ground truthing.
29 July	• BC Hydro provided 2nd draft of Environmental Assessment Application, and Rev 5 studies to Secwepemc Schedule C bands.
5 August	• BC Hydro advised STWG that geomorphology, hydrology, erosion, RAP data and Columbia Water Use Plan works program (CLBWORKS) information had been uploaded to the SharePoint site.
10 August	• STWG provided written responses to the proposed scope of work for Archaeological Potential Model.
11 August	• BC Hydro meeting with TMICW (Neskonlith) to provide a status report on the Project.
12 August	• STWG provided comments to BC Hydro on the S14 Permit Application.
12 September	• BC Hydro provided a second draft of the dAIR and dVC to STWG for further review.
9 September	• BC Hydro meeting with Neskonlith Chief and Council to discuss the Project, the EA process, and Neskonlith participation. • BC hydro responded to STWG request for reference documents identified in Part B (Fish and Fish Habitat) of the draft application.

Chronology of Events Secwepemc 2016	
Date	**Event**
14/15/16 September	• STWG representatives attended the TTG meetings in Revelstoke (hydro-technical/geophysical, archaeology, vegetation, wetlands, wildlife, fish and aquatics).
03 October	• STWG meeting with BC Hydro Subject Matter Experts to review the draft EA. • BC Hydro agreed to provide additional funding to the Secwepemc Bands to undertake additional work related to community engagement F, Part C technical assessment, Project coordination and cultural heritage assessment.
10 October	• BC Hydro provided to STWG the SharePoint links to information on climate change referenced in the September 14-16 TTG meetings.
19 October	• BC Hydro met with Neskonlith Chief and Council to brief Chief and Council on the Project status (Chase).
26 October	• STWG provided BC Hydro with a letter outline their concerns with information presented in the draft Application including use of TK, baseline studies, cumulative effect and ecological communities).
01 November	• BC Hydro received STWG draft response and detailed comments table following the review of the July draft EA for the proposed Project.
8 November	• STWG representatives participated in the Archaeology TTG #3 meeting (Revelstoke).
11 November	• BC Hydro and Sexqeltkemc te Sepwepemc (STS), comprised of Adams Lake Indian Band, Neskonlith Indian Band and Splatsin, signed a Capacity Funding Amending Agreement. • BC Hydro and Shuswap Indian Band signed a Capacity Funding Amending Agreement. • BC Hydro and Little Shuswap Lake Indian Band signed a Capacity Funding Amending Agreement.
15 November	• BC Hydro and Simpcw Indian Band signed a Capacity Funding Amending Agreement.
16 November	• BC Hydro circulated the draft Aboriginal Consultation Report #1 to Schedule C bands.
01 December	• Technical Task Group.
15 December	• STWG submitted a draft Part C to BC Hydro.

Chronology of Events Secwepemc 2017	
Date	**Event**
25 January	• BC Hydro received second draft Part C report from STWG.
27 January	• BC Hydro circulated draft Aboriginal Consultation Report #2 to Schedule C Secwepemc.

11.1.8 Traditional Ecological Knowledge (TEK) Traditional Land Use Information (TLUS)

Aboriginal groups shared information Traditional Ecological Knowledge (TEK) and Traditional Land Use Information (TLUS) with BC Hydro, and this has been incorporated into Part B. In addition, Aboriginal groups

have provided information and references to the use and importance of TEK and TLUS throughout their respective Part C chapters. Table 11-4 provides a number of discreet and representative links to sections within the Nations' respective Part C chapters where TEK and TLUS are of primary focus, (as identified by BC Hydro). The table should not be viewed as a complete reference to discussion of TEK and TLUS and the assessment of Project impacts on Aboriginal interests. To gain a better understanding of Aboriginal group perspectives each Aboriginal group's Part C contributions should be read in its entirety[1].

Table 11-4: TEK and TLUS Selected References to Aboriginal Groups' Part C Contributions

Traditional Ecological Knowledge (TEK), Traditional Land Use Information (TLUS) Selected References to Aboriginal Groups Part C Contributions			
	Ktunaxa	**Okanagan Nation**	**Secwépemc**
TEK	**C3**: Ktunaxa Title and Rights: Traditional Knowledge and Language **C3.1**: Intangible Cultural Heritage **C3.2**: Tangible Cultural Resources **C3.2.3**: Future Ktunaxa relationship with and knowledge of land and water **C3.3**: Traditional Knowledge and Language: Project Effects, Mitigation and Significance	**1.4.5.** Data Collection and Analysis **3.2.** The Project in the Okanagan Nations' Cultural Landscape **3.3.** Project Impact Pathways **6.2**. Assessing Effects to Date on Okanagan Culture **6.3.2**. Cumulative Effects on Okanagan Ability to Transmit Knowledge **Appendix C**: PIB-Okanagan Traditional Ecological Knowledge and Assessment	**Sec E:** Secwepemc Traditional Use and Knowledge of the Upper Columbia River Valley (p15) **Sec E:** Summary of Site-Specific Traditional Use Values (p24) **Table 1:** Adams Lake and Neskonlith Traditional Use Site Data (Selected Species) **Table 2:** Traditional Seasonal Round **Table 3:** Traditional Use Value Categories and Examples
TLUS	**C.1.7.1**: Ktunaxa Land Use Stewardship and Policy **C3.2.2**: Current Ktunaxa Use and Occupancy **C7**: Lands and resource use **Table X**: Historical baseline of cumulative effects	**1.3.3**. Holistic Effects Assessment **2.3.** Ethnographic and Historic Background **6.1.1**. Beyond Archaeology: The Case for an Expanded Definition of Culture in Assessment of Effects on Okanagan Nation	**Sec E:** Traditional Ecological Knowledge and Traditional Land Use Information **Sec E:** Ethnobotony **Sec E**: Summary of Site-Specific Traditional Use Values **Sec E:** Simpcw Traditional Land Use and Ecological Knowledge

11.1.9 Summary of Key Issues and Concerns Raised by Aboriginal Groups

Table 11-5 provides a summary of key issues and concerns expressed by Aboriginal groups, (as understood by BC Hydro). These issues and concerns are common to all Aboriginal groups and have been raised in a number of forums including Revelstoke 6 Project working groups, Core Committee meetings, one-on-one

[1] During consultation Aboriginal groups have stated that they prefer not to compartmentalize information, they prefer to present their perspectives in a more holistic and integrated fashion.

meetings with Chief and Council, community and Aboriginal group representatives, written correspondence, reviews and comments on studies, including the draft Application Information Requirements (dAIR) and Valued Components. BC Hydro has responded to all the issues and concerns raised, and the status of whether or not each issue or concern has been resolved is identified in the table.

Further details about each of these issues and concerns, and additional issues and concerns are provided in the Aboriginal issues, concerns and Interests tracking tables appended to the Aboriginal Consultation Report. Aboriginal groups have also provided information on key issues relevant to the environmental assessment raised during consultation in their respective Part C contributions.

Consultation with potentially affected Aboriginal groups on their key issues and concerns is ongoing. BC Hydro will continue to work with Aboriginal groups to consider new information about Aboriginal interests and the potential effects of the Project on these interests, and to consider how this information will be incorporated where appropriate into the Project planning.

Table 11-5: Summary of Key Issues and Concerns Raised by Aboriginal Groups

Summary of Key Issues and Concerns Raised by Aboriginal Groups		
Issue Concern Or Interest	**BC Hydro Consideration/Response**	**Status Resolution**
ENGAGEMENT CONSULTATION AND PARTICIPATION		
Capacity Funding Lack of timely capacity funding that delayed the start of studies and actions that are useful in informing the effects assessment, and the development of mitigation measures.	BC Hydro has provided capacity funding to all Schedule C Aboriginal groups. In some instances the identification of studies such as socio-economic and cultural resources studies occurred late in the consultation process. BC Hydro worked with Aboriginal groups to ensure funding was in place either through interim or supplemental agreements.	BC Hydro will continue to work with Aboriginal groups to provide funding or resources enabling the Nations' ability to participate in ongoing meaningful consultation.

Summary of Key Issues and Concerns Raised by Aboriginal Groups		
Issue Concern Or Interest	**BC Hydro Consideration/Response**	**Status Resolution**
Part C Authorship Concerns that Aboriginal group Part C contributions cannot be completed when they identify potential Project effects in areas that are not further assessed in Part B. This is of particular concern where the Part B assessment did not identify residual effects, and therefore there is no cumulative effects assessment for Part C authors to reference.	BC Hydro and Aboriginal groups identified in Schedule C of the Section 11 Order have participated in numerous meetings and technical subcommittee workshops as part of the Core Committee process.	On-going discussions with First Nations, EAO, and BC Hydro regarding outstanding issues of concern and potential mitigation measures.
ENVIRONMENTAL ASSESSMENT		
Choice of Valued Components (VC) Concerns that VCs recommended by Aboriginal groups for the Project were not included as VCs in Part B, such as • Water • Ecosystem Health and Function and Biodiversity	Effects of regulation of the Columbia River are discussed in the Hydrology Section of Part B, and as context in the existing conditions discussions of individual VCs, where appropriate. Ecosystem Health and Function for Biodiversity is included as a sub-component of the Ecological Communities VC where linkages will be considered between habitats available within the study areas and the occurrence of both flora and fauna.	Project effects assessment complete. Continuing related programs: • BC Hydro participation in Provincial Historical Grievances Table.
Adequacy of Effects Assessment Concern that Part B effects assessment findings of limited potential Project effects do not reflect perceived potential effects of some community members. Concerns that non-measurable effects are underestimated when applied across ecosystems in the Mid-Columbia River.	The Part B effects assessment is a comprehensive assessment of measurable interactions between the Project and the VCs, including direct and indirect effects. Implementation of the Project would not result in changes to normal Revelstoke Reservoir or Arrow Lakes Reservoir operating ranges, and daily water level fluctuations would be similar to those of existing operations. While the assessment completed in Part B identified no significant residual effects for ecological VCs, BC Hydro acknowledges the potential for non-measurable effects, obscured by natural variability.	On-going discussions with First Nations, EAO, and BC Hydro regarding potential Project effects and potential mitigation measures.

Summary of Key Issues and Concerns Raised by Aboriginal Groups		
Issue Concern Or Interest	**BC Hydro Consideration/Response**	**Status Resolution**
Determining Cumulative Effects, Residual Effects, and Significance Concerns that the BCEAO guidelines limit the opportunities for a comprehensive effects assessment Concerns that the cumulative effects assessment only takes into account incremental effects of REV6 and doesn't take into account the accumulated effects of the whole hydroelectric development. Concerns that significance thresholds and acceptable risks are not adequately considered and incorporated for each VC.	BC Hydro acknowledges the long-standing concerns of Aboriginal groups regarding the effects of hydroelectric development. Cumulative effects assessment considers the effects of past, present, and reasonably foreseeable future development where there is an interaction with the residual effects of the proposed project as outlined in the EAO guidelines. Information on pre-dam conditions and the effects of Columbia River regulation are discussed in the context of existing conditions and describe, as applicable, historical conditions and past change for many of the VCs, but in some cases is limited by the data available to describe historic conditions. Aboriginal perspectives on significance criteria have been considered. Significance criteria have been presented in the dAIR and are described in greater detail in Part B.	Project effects assessment complete. Cumulative effects assessed for heritage and socio-economic residual Project effects. Continuing related programs: • BC Hydro participation in Provincial Historical Grievances Tables. • Fish and Wildlife Compensation Program (FWCP).
Boundary of Terrestrial Assessment Requested project-specific field programs be undertaken to characterize the existing environment. Requested expansion of the Generation LSA to include entire Revelstoke Reservoir	Rigorous field programs for many VCs are being conducted for the WUP studies. These studies describe the existing environment. Additional studies were added to understand the habitats and potential species occurrence where data was limited. Discussions have generally focused on potential effects downstream of Revelstoke Dam. In the REV 5 EA potential effects within the Revelstoke Reservoir were considered but were found to be negligible or none. A 20 cm change within the current operational bounds is not expected to affect any VCs.	Rigorous field programs for many VCs are being conducted for the WUP studies. These studies describe the existing environment. Additional studies were added to understand the habitats and potential species occurrence where data was limited. Discussions have generally focused on potential effects downstream of Revelstoke Dam. In the REV 5 EA potential effects within the Revelstoke Reservoir were considered but were found to be negligible or none. A 20 cm changes within the current operational bounds are not expected to affect any VCs.

Summary of Key Issues and Concerns Raised by Aboriginal Groups		
Issue Concern Or Interest	**BC Hydro Consideration/Response**	**Status Resolution**
ARCHAEOLOGY, HERITAGE, CULTURAL RESOURCES		
Cultural Resources and Traditional Knowledge Concerns that potential effects on Cultural Heritage (tangible and intangible resources) would not be adequately identified and addressed if assessed as part of the Archaeological assessment and therefore should be considered a separate VCs and addressed by Aboriginal groups in Part C Also, lack of clarity on how traditional ecological knowledge (TEK) will be included.	Cultural Heritage and Archaeology were split into separate VCs. Aboriginal groups presented Cultural Heritage information, including TEK, in their respective Part C. BC Hydro understands the importance of TEK and contributions from knowledge holders, and has considered TEK and contributions from knowledge holders, where provided, in Part B.	Additional fieldwork is planned to further inform the assessment. On-going discussions with First Nations, EAO, and BC Hydro regarding potential Project effects and potential mitigation measures. Continuing related programs: Reservoir Archaeology Program Suggestions related to First Nation management of the RAP will be shared with the Columbia TWG.
AQUATIC AND TERRESTRIAL RESOURCES		
Fish and Fish Habitat (including Passage and Entrainment) Concerns that the Project could impede future fish passage. Changes in water flows could negatively affect fish habitat, including access to spawning habitat, tributaries, and nutrients. Concerns that the Project could increase entrainment. Concerns that the Project could affect sturgeon.	Indicators for Fish and Fish Habitat VC were revised in Part B. Water Quality was added as an IC in Part B. BC Hydro completed a fish passage study. BC Hydro has noted that previous work on bull trout and kokanee in Revelstoke Reservoir has not identified tributary access issues. Potential Project effects on water level fluctuations on Revelstoke Reservoir, including magnitude, duration, and frequency across seasons, were assessed. BC Hydro completed a fish entrainment assessment. Potential effects on sturgeon were assessed and no potential negative effects were identified.	Project effects assessment complete. Continuing related programs: • Fish Entrainment Strategy and Working Group • Total Dissolved Gas Management Plan • Upper Columbia White Sturgeon Management Strategy • Fish Entrainment Strategy and Working Group • Fish and Wildlife Compensation Program

Summary of Key Issues and Concerns Raised by Aboriginal Groups		
Issue Concern Or Interest	**BC Hydro Consideration/Response**	**Status Resolution**
Salmon Restoration Interest in ensuring that the Project will not negatively affect the potential for re-introduction for salmon, by impairment of habitat or passage. Interested in taking steps to support restoring salmon to the Mid-Columbia River.	The Project's potential to affect fish passage was studied and found to be neutral, i.e. the Project would neither aid nor impair fish passage.	The Canadian Columbia River Intertribal Fisheries Commission (CCRIFC) has proposed the formation of a multiagency committee to examine the feasibility of salmon restoration in the Columbia. BC Hydro has agreed to participate in such a committee.
Water Quality, including Mercury Changes in water quality and flows could negatively affect fish and human health.	The Project will not affect water quality as operations will continue within the existing drawdown zone, and no vegetation outside the existing drawdown zone will be inundated therefore no predicted effects from mercury ate anticipated during Project construction.	Project effects assessment complete. Monitoring of water quality will be conducted upstream and downstream of Revelstoke Dam during the Project construction phase.
Erosion Project increases to or changes in erosion and inundation zones could result in impacts to riparian vegetation, sensitive ecosystems, and heritage archaeological resources.	The Project will not affect riparian vegetation or sensitive ecosystems on a community level. Potential effects to known archaeological sites, and sites with identified high potential for archaeological resources, were identified.	An iterative process of assessment for all sites has been initiated starting with high priority sites, and assessment will continue through the Project and BC Hydro's Reservoir Archaeology Program (RAP).
Birds Project could affect listed species, migratory birds, and raptors. Project could result in inundation of active ground nests. Project could affect cavity nester habitat. Project changes to water levels could affect wading birds.	BC Hydro reviewed Water Use Plan (WUP) bird survey information and other studies with hydrological modelling to assess potential impacts to listed species, migratory birds, and raptors. No measurable effects were identified.	Project effects assessment complete. Continuing related programs: • Columbia WUP studies • Fish and Wildlife Compensation Program
Wildlife and Wildlife Habitat Project could result in displacement, disturbance, or habitat loss for mammals including ungulates and furbearers, ecological communities including sensitive ecosystems and listed species, and herptiles.	The assessment has considered these potential effects for both the Generation and Transmission components of the work, and no measurable effects were identified.	Project effects assessment complete. Continuing related programs: • Columbia WUP studies • Fish and Wildlife Compensation Program

Summary of Key Issues and Concerns Raised by Aboriginal Groups		
Issue Concern Or Interest	**BC Hydro Consideration/Response**	**Status Resolution**
ABORIGINAL ECONOMIES		
Aboriginal Economies Interested in maximizing the benefits of economic opportunities associated with the Project.	BC Hydro is committed to respecting and supporting the interests of Aboriginal communities. BC Hydro will implement its Aboriginal Procurement Policy that respects standing agreements and encourages wherever practicable, meaningful opportunities and benefits to Aboriginal communities, Aboriginal Businesses and Aboriginal individuals in British Columbia particularly for those in whose traditional territory the Work is performed.	Discussions ongoing concerning procurement, education and training opportunities related to the Project.
COMMUNITY WELLBEING		
Community Wellbeing Project workers and their families could experience stress and disconnection from community supports during employment.	BC Hydro acknowledges the challenges of workers commuting to the work site, and is considering this in its early Project planning.	On-going discussions with First Nations, EAO, and BC Hydro regarding potential mitigation measures.
Revenues Request to provide estimates of anticipated revenue from the Project, the additional 3000 cfs water license, and the Revelstoke Dam and Generating Station as a whole.	At this time, BC Hydro does not report revenue on a per facility basis. The primary benefit of the Project is to provide additional capacity during peak demand periods for electricity. The additional 3000 cfs water license reflects greater efficiencies in the existing Unit 5 turbine and generator unit, and the potential Unit 6 turbine and generator unit. However, the anticipated amount of energy generated and revenue are not anticipated to be substantial, once fluctuation of market pricing and the likely infrequent use of additional generating capacity are factored.	No further action.
Human Health Concerns that the Project and overall hydroelectric development of the Columbia River could affect access to and the safety and sustainability of traditional foods and medicines.	The Part B effects assessment considered potential effects to human health, and found the Project will not affect water quality, or the safety of traditional foods or medicines as operations will continue within the existing drawdown zone, and no vegetation outside the existing drawdown zone will be inundated	Project effects assessment complete. While the Project will not affect Human Health, BC Hydro, and Aboriginal groups will continue to discuss outstanding concerns and proposed mitigation measures.

Summary of Key Issues and Concerns Raised by Aboriginal Groups		
Issue Concern Or Interest	**BC Hydro Consideration/Response**	**Status Resolution**
	and, therefore no predicted effects from mercury ate anticipated during Project construction.	
ICE		
Ice Patterns of ice formation could change, resulting in increased erosion and effects on wildlife.	The Project is not anticipated to affect ice formation. Ice formation in the Revelstoke Reservoir is limited to tributaries near and above Downie Arm. Ice formation below Revelstoke Dam is governed by localized weather effects and Arrow Lakes Reservoir operations. BC Hydro has prepared a Technical Memo that discusses considerations pertaining to ice.	Complete
CLIMATE CHANGE		
Climate Change Concerns that evaluation of climate change impacts on the Project was not sufficient.	Potential effects of climate change on the Project were assessed in a memo included as Appendix 4.1-III of the Application. Climate change was discussed in 10.4. Section 4.1.1.8.1 discusses climate change influence on water supply. Sensitivity to different inflow years is discussed in Section 4.1.1.9.1.	Project effects assessment complete.

11.2 Aboriginal Interests

11.2.1 Description of Aboriginal Interests

Aboriginal groups have provided descriptions of their Aboriginal interests in their respective Part C contributions. Table 11-6 highlights key references to the discussion of Aboriginal interests in each aboriginal groups Part C contribution, (as identified by BC Hydro). The table provides a number of discreet and representative links to sections within the Nations' respective Part C chapters where Aboriginal interests are described, (as identified by BC Hydro). The table should not be viewed as a complete reference to discussion of Aboriginal interests, and the assessment of Project impacts on Aboriginal interests. To gain a better understanding of Aboriginal group perspectives each Aboriginal group's Part C contributions should be read in its entirety.

Table 11-6: Aboriginal Interests References to Aboriginal Groups' Part C Contributions

Aboriginal Interests Selected References to Aboriginal Groups' Part C Contributions			
	Ktunaxa	**Okanagan Nation**	**Secwépemc**
Ethnography	**C1-5:**Ethnographic and Historic Background (C1-17/18)	**2.4.** Okanagan Ethnographic and Historic Background	**12:1.1** Secwepemc Bands **12:e** Traditional Ecological Knowledge and Traditional Land Use Information
Language	**C1:** Ktunaxa Nation Background Information, Project Understanding, and Methods (C1-21/C35)	Pre-amble **2.1.** The Okanagan Nation	**f4** Sexqeltqiń (Adams Lake Indian Band) (p46) **f13** Neskonlith(p51) **f22** Splatsin(p52) **f31** Simpcw (p64) **f40** Kenpesq't (Shuswap Band) (p69) **f49** Sqwlax [Little Shuswap Lake] (p 75)
Governance	**C1:** Ktunaxa Nation Background Information, Project Understanding, and Methods (C1.6 and C1.7)	**2.4.2.** Okanagan Governance System	**12f:** The Eastern Secwepemc **(p35)**
Economy	**C3:** Economic Investment Sector (C4-1/C4-12)	**7.1-7.3.** Livelihoods and Economy	**12f** Historical Eastern Secwepemc Economy (p 41) **f5-f9** Sexqeltqiń (Adams Lake Indian Band) (p47-49) **f14-f18** Neskonlith(p52-54) **f23-f27** Splatsin(p58-60) **f32-f36** Simpcw (p64-67) **f41-45** Kenpesq't (Shuswap Band) (p 70-72) **f50-54** Sqwlax [Little Shuswap Lake] (p 76-79)
Reserves	**C1.1:** Ktunaxa Nation Background Information, Project Understanding, and Methods(C1-8-C1-13)	**2.2.** Potentially Affected Communities **2.3.** Okanagan Nation Territory **2.3.1.** Okanagan Indian Band **2.3.2.** Westbank First Nation **2.3.3.** Penticton Indian Band **2.3.4.** Okanagan Nation Alliance	**12f:** Secwepemc – General Sexqeltqiń (Adams Lake Indian Band) (p43-49) Neskonlith (p49-54) Splatsin (p55-60) Simpcw (p61-67) Kenpesq't (Shuswap Band) (p 67-72) Sqwlax [Little Shuswap Lake] (p 73-79)

Table 11-7 provides a summary of Aboriginal Interests identified during BC Hydro's Consultation process including Revelstoke 6 Project working groups, Core Committee meetings, one-on-one meetings with Chief and Council, community and Aboriginal group representatives, written correspondence, reviews and comments on studies, including the draft Application Information Requirements (dAIR) and Valued Components.

Table 11-7: Summary of Aboriginal Interests Identified by Aboriginal Groups

Summary of Aboriginal Interests Identified by Aboriginal Groups		
Interest	**BC Hydro Consideration/Response**	**Status Resolution**
CULTURAL RESOURCES AND TRADITIONAL KNOWLEDGE • Loss of traditional land and resource use • Loss of cultural and spiritual enjoyment • Transmission of TEK		
Cultural Heritage Concerns that potential effects on Cultural Heritage (tangible and intangible resources) would not be adequately identified and addressed if assessed as part of the Archaeological assessment and therefore should be considered a separate VCs and addressed by Aboriginal groups in Part C. Concerns that increased erosion of shorelines and riparian areas will impact archaeological and cultural properties. Also, lack of clarity on how traditional ecological knowledge (TEK) will be included.	Cultural Heritage and Archaeology were split into separate VCs. Aboriginal groups presented Cultural Heritage information, including TEK, in their respective Part C. BC Hydro has identified potential Project effects to archaeological sites through increased erosion. BC Hydro understands the importance of TEK and contributions from knowledge holders, and has considered TEK and contributions from knowledge holders, where provided, in Part B.	BC Hydro has proposed mitigation measures in Part B, Section 7, and is actively engaging affected Aboriginal Groups to develop culturally appropriate approaches and mitigation measures. Continuing related programs: • Reservoir Archaeology Program • Suggestions related to First Nation management of the RAP will be shared with the Columbia TWG.
FISHING • Loss of fishing areas and opportunities • Loss of use of traditional resources		
Fish and Fish Habitat (including Passage and Entrainment) Concerns that the Project could impede future fish passage. Changes in water flows could negatively affect fish habitat, including access to spawning habitat, tributaries, and nutrients. Concerns that the Project could increase entrainment. Concerns that the Project could affect sturgeon.	BC Hydro has not identified potential Project effects for fish and fish habitat. Indicators for Fish and Fish Habitat VC were revised in Part B. Water Quality was added as an IC in Part B. BC Hydro completed a fish passage study. BC Hydro has noted that previous work on bull trout and kokanee in Revelstoke Reservoir has not identified tributary access issues. Potential Project effects on water level fluctuations on Revelstoke Reservoir, including magnitude, duration, and frequency across seasons, were assessed.	BC Hydro acknowledges the perspective of Aboriginal groups and is actively engaging with Aboriginal groups to better understand and address their concerns. Continuing related programs: • Fish Entrainment Strategy and Working Group • Total Dissolved Gas Management Plan • Upper Columbia White Sturgeon Management Strategy • Fish Entrainment Strategy and Working Group • Fish and Wildlife Compensation Program

Summary of Aboriginal Interests Identified by Aboriginal Groups		
Interest	**BC Hydro Consideration/Response**	**Status Resolution**
	BC Hydro completed a fish entrainment assessment. Potential effects on sturgeon were assessed and no potential negative effects were identified.	
Salmon Restoration Interest in ensuring that the Project will not negatively affect the potential for re-introduction for salmon, by impairment of habitat or passage. Interested in taking steps to support restoring salmon to the Mid-Columbia River.	The Project's potential to affect fish passage was studied and found to be neutral, i.e. the Project would neither aid nor impair fish passage.	BC Hydro acknowledges the perspective of Aboriginal groups and is actively engaging with Aboriginal groups to better understand and address their concerns. The Canadian Columbia River Intertribal Fisheries Commission (CCRIFC) has proposed the formation of a multiagency committee to examine the feasibility of salmon restoration in the Columbia. BC Hydro has agreed to participate in such a committee.
Water Quality, including Mercury Concerns that changes in water quality and flows could negatively affect fish and human health.	The Project will not affect water quality as operations will continue within the existing drawdown zone, and no vegetation outside the existing drawdown zone will be inundated therefore no predicted effects from mercury ate anticipated during Project construction.	Project effects complete. BC Hydro has not identified potential project effects for fish and fish habitat or effects on human health. Monitoring of water quality will be conducted upstream and downstream of Revelstoke Dam during Project construction.
HUNTING AND TRAPPING • Loss of culturally important wildlife and habitat • Loss of access to areas for resource harvesting and resource management		
Wildlife and Wildlife Habitat Concerns that the Project could result in displacement, disturbance, or habitat loss for mammals including ungulates and furbearers, ecological communities including sensitive ecosystems and listed species, and herptiles. Concerns that noise from Project construction activities will decrease return on effort for harvesting in both respective LSAs for the duration of the construction phase	The assessment has considered these potential effects for both the Generation and Transmission components of the work, and no measurable effects were identified. Construction work will result in temporary increases to noise near the Transmission and Generation LSAs; however, BC Hydro has not identified potential effects related to noise at either LSA.	Continuing related programs: • Columbia WUP studies, Fish and Wildlife Compensation Program
Birds Concerns that the Project could affect listed species, migratory birds, and raptors and cavity nester habitat.	BC Hydro reviewed Water Use Plan (WUP) bird survey information and other studies with hydrological modelling to assess potential impacts to listed species, migratory birds, and	BC Hydro acknowledges the perspective of Aboriginal groups and is actively engaging with Aboriginal groups to better understand address their concerns. Continuing related programs:

Summary of Aboriginal Interests Identified by Aboriginal Groups		
Interest	**BC Hydro Consideration/Response**	**Status Resolution**
Project could result in inundation of active ground nests. Project changes to water levels could affect wading birds.	raptors. No measurable effects were identified. BC Hydro has not identified potential Project effects to wetlands, wildlife populations, or biodiversity.	• Columbia WUP studies, Fish and Wildlife Compensation Program
HARVESTING • Loss of medicine gathering sites and opportunities. • Reduced food security		
Concerns that disturbance and/or loss of lands, food and medicinal plants from road building, introduction of non-native invasive weeds and use of herbicides adjacent to reservoir, roads and construction sites. Concerns that historical reservoir operations and gaps in Project information about vegetation communities that existed prior to the initial construction of the Project will perpetuate ongoing impacts to harvesting.	BC Hydro has not identified potential Project effects on plant harvesting areas or reduced food security. Permanent alteration of terrestrial habitat has been identified within the footprint of the Capacitor Station	BC Hydro has proposed mitigation measures in Part B, Section 4.4, and is actively engaging affected Aboriginal Groups to develop culturally appropriate approaches and mitigation measures to addressing effects at the Capacitor Station.

11.2.2 Potential Adverse Effects of the Project on Aboriginal Interests

Aboriginal groups have provided their views of potential Project effects in their respective Part C contributions. Table 11-8 provides a number of discreet and representative links to sections within the Nations' respective Part C chapters where potential adverse effects have been identified by Aboriginal groups, (as identified by BC Hydro). The table should not be viewed as a complete reference to the presentation of potential adverse project effects on Aboriginal interests. To gain a better understanding of Aboriginal group perspectives each Aboriginal group's Part C contributions should be read in its entirety.

Table 11-8: Selected References to Potential Adverse Effects of the Project on Aboriginal Interests Taken from Aboriginal Groups' Part C Contributions

Potential Adverse Effects of the Project on Aboriginal Interests Selected References to Aboriginal Groups' Part C Contributions			
	Ktunaxa	**Okanagan Nation**	**Secwépemc**
Cultural Resources	**C1.9:** Summary of Anticipated Project Effects **Figure C1-4:** Anticipated Project and Cumulative Impact Pathways **C3.3:** Traditional Knowledge and Language: Project Effects, Mitigation and Significance **C3.4:** Traditional Knowledge and Language Sector: Characterization of Residual Project Effects	**6.4.1.** Project Impact Pathways on Okanagan Culture **6.4.2.** BC Hydro Committed-to Mitigation Measures re: Culture **8.4.** Revelstoke 6 Project-Specific Effects Pathways on Okanagan Community Well-being	Loss of Spiritual/Ceremonial Sites and Opportunities **(p.88)** Loss of Habitat Sites and Opportunities **(p.88)** **Table 69 (p.116)**
Hunting/ Trapping	**C7.3.1.3:** Culturally Important Wildlife and Habitat **Figure C1-4:** Anticipated Project and Cumulative Impact Pathways **C7.4.2.2:** Culturally Important Wildlife and Habitat Anticipated Project Effects	**7.4.** Rev6 Project-Specific Effects Pathways on Syilx Livelihoods and Economy **7.4.1.** Project Impact Pathways on Syilx Livelihoods and Economy	Loss of Hunting Areas and Opportunities **(p.85)** **Table 69 (p.114)**
Fishing	**C1.9:** Summary of Anticipated Project Effects **C2:** Ktunaxa Title and Rights: Napituk (Water) **C2.1.1:** Water as a Valued Component and Ktunaxa Threshold of Significant Effects **C7.3.1.4:** Culturally Important Fish (Salmon, Sturgeon, Other Fish) and Fish Habitat **C7.4.2.3:** Fish Anticipated Project Effects	**5.4.** Revelstoke 6 Project Effects on Okanagan Fish and Fishing Values **5.4.1.** Potential Impact Pathways of the Project on Syilx Fish and Fishing Values **5.4.1.2.** Additional Potential Impact Pathways on Fish and Fishing Identified by Okanagan	Loss of Fishing Areas (p.85) **Table 69 (p.112)**
Gathering	**Figure C1-4:** Anticipated Project and Cumulative Impact Pathways **C3.2.3.1:** Current Ktunaxa Harvesting in the Upper and Mid-Columbia River **C6.1.3.2:** Indirect Health Indicators: Food Security and Confidence in Wild Foods **C6.3.2:** Social Sector Residual Project Effects Assessment **C7.4.2.1:** Culturally Important Terrestrial Ecosystems, Habitats and Plants Anticipated Project Effects	**7.4. Rev6** Project-Specific Effects Pathways on Syilx Livelihoods and Economy **7.4.1.** Project Impact Pathways on Syilx Livelihoods and Economy	Loss of Plant Harvesting Areas and Opportunities **(p.86)** Loss of Medicine Gathering Sites and Opportunities **(p.87)** Table 69 **(p.113, 115)**

11.2.3 Summary of Mitigation Measures for Aboriginal Interests Proposed by First Nations

Table 11-9 provides a summary of mitigation measures proposed by First Nations to avoid or mitigate potential adverse Project effects to Aboriginal interests. Aboriginal groups provided these proposed measures in writing to BC Hydro. Secwepemc mitigation measures are presented in Section 12-h and 12.2.6 of their Part C contribution. Ktunaxa mitigation measures are included in Appendix C-I and Okanagan mitigation measures are included in Appendix Ca of this Application. These proposed measures are preliminary, and were provided without prejudice, for the purposes of discussion. Final mitigation measures to be implemented for the Project will be determined and agreed to with BC EAO, affected First Nations, and BC Hydro.

Table 11-9: Mitigation Measures to Avoid or Reduce Potential Adverse Effects on Aboriginal Interests Proposed by Aboriginal Groups

Mitigation Measures, Proposed by Aboriginal Groups, to Avoid or Reduce Potential Adverse Effects on Aboriginal Interests
Fishing: Proposed mitigation measures to address potential loss of fishing areas and opportunities; access to and use of traditional resources; incorporation of TEK; and, increased Aboriginal stewardship of aquatic resources.
• Provide funding to First Nations to support participation of First Nations in water/aquatic stewardship activities. • Expedite implementation of current mitigation strategies and institute fish monitoring program enhancements (Life of Project). • Undertake comprehensive monitoring, restoration and adaptive management plan for potential or anticipated Revelstoke 6 operational impacts on fish, aquatics and riparian areas. • Jointly develop a strategy to include technical information gained from studies into ongoing operations that incorporate ecosystem (re-establishing seasonal and emulate natural or pre-development hydrologic conditions). • Develop a fish and fish habitat community research partnership. • Consider First Nation partnership in the Fish and Wildlife Compensation Program. • Conduct an evaluation of opportunities for mitigation of existing impacts to fish and fish habitat through modification of the Revelstoke 6 project design and develop an Aquatic Habitat Restoration Plan. • Develop and implement a fish passage restoration plan. • Fund Elders and traditional land and resource users to participate in studies and provide TEK.
Gathering and Harvesting: Proposed mitigation measures to address potential loss of plant harvesting areas and opportunities; loss of medicine gathering sites; access to and use of traditional resources; incorporation of TEK; and, increasing confidence in food security.
• Provide funding to First Nations to support wild food harvesting and food security initiatives. • Secure and purchase ecologically significant lands within the LSA for conservation, enhancement and stewardship activities. • Fund First Nation community member's education for environmental and traditional use programs. • Establish a Biodiversity Management Plan. • Provide funding for to research impacts to terrestrial wildlife and vegetation related to management of flows on the MCR, ALR and RR. • Design and implement meaningful wetland restoration/creation and habitat structural enhancement projects in Revelstoke Reach Follow-up and monitoring of peaking operation instantaneous discharge effects, and monitoring fine sediment erosion / deposition processes.

Mitigation Measures, Proposed by Aboriginal Groups, to Avoid or Reduce Potential Adverse Effects on Aboriginal Interests
• Continue CLBMON33/12 monitoring of plant communities in the DDZ at landscape and site levels. • Develop an eco-cultural restoration programs. • Undertake studies to re-establish pre-dam habitat quality. • Secure and purchase ecologically significant lands within the LSA for conservation, enhancement and stewardship activities. • Develop a protocol to avoid impacting wildlife during their critical seasonal activities. • Implement a monitoring and adaptive management plan to address negative changes in wildlife movement patterns and habitat use. • Employ TEK and emerging techniques in disturbed site restoration. • Design and implement a rehabilitation, restoration and biodiversity improvement plan to return the area disturbed by Rev 6 activities. • Consult with First Nations and knowledge holders to determine wildlife habitat values and wildlife activity, and in dealing with wildlife-related issues. • Ensure ongoing monitoring of migratory birds.
Hunt and Trapping: Proposed mitigation measures to address potential loss of hunting areas and opportunities; loss of habitat; loss of access to previously desirable areas for resource harvesting and resource management.
• Undertake studies to re-establish pre-dam habitat quality. • Secure and purchase ecologically significant lands within the LSA for conservation, enhancement and stewardship activities. • Develop a protocol to avoid impacting wildlife during their critical seasonal activities. • Implement a monitoring and adaptive management plan to address negative changes in wildlife movement patterns and habitat use. • Employ TEK and emerging techniques in disturbed site restoration. • Design and implement a rehabilitation, restoration and biodiversity improvement plan to return the area disturbed by Rev 6 activities. • Consult with First Nations and knowledge holders to determine wildlife habitat values and wildlife activity, and in dealing with wildlife-related issues. • Ensure ongoing monitoring of migratory birds.
Cultural Resources: Proposed mitigation measures to address potential loss of spiritual/ceremonial sites; loss of cultural opportunities and spiritual enjoyment
• Fund and implement a Columbia Basin Cultural Heritage Management Board. • Develop and implement a culturally appropriate adaptive archaeological management plan. • Develop and implement a mitigation strategy to address impacts to known archaeological sites in Arrow, Revelstoke and Kinbasket Reservoirs. • Complete an inventory of 100% of modeled high archaeological potential in the LSA, and a representative sample of low archaeological potential. • Expand the archaeological potential model to other reservoirs the region. • Expand archaeological studies to determine whether effects of Revelstoke 6 impacts the Nakusp Narrows. • Revisit archaeological sites where inventory is incomplete, and complete inventory. • Biannual monitoring of effects on LSA archaeological sites at low pool and fund research regarding identification and investigation of intact sites above full pool. • Fund community members' education for archaeology/anthropology programs.

Mitigation Measures, Proposed by Aboriginal Groups, to Avoid or Reduce Potential Adverse Effects on Aboriginal Interests
• Provide adequate capacity First Nations to have meaningful involvement in the development of archaeological monitoring activities • Develop and fund an Elder's Action Committee for managing ancestors. • Develop, implement, and fund a guardian archaeology watchmen program and involve and train community members to carry out monitoring.
Cumulative Impacts on Title and Rights: Proposed mitigation measures to address cumulative impacts on Aboriginal Title
• Provide funding for a regional cumulative effects assessment on water and aquatic ecosystems. • Conduct a comprehensive cumulative effects assessment to better understand past, present, and future impacts on cultural and natural resources in the Upper Columbia River Basin. • Develop and adaptive cultural and natural resource management programs.

11.2.4 Characterization of Residual Effects on Aboriginal Interests after Mitigation

The final characterization of residual effects will be assessed based on mitigation measures, which Aboriginal groups are discussing with BC Hydro and the BC EAO.

BC Hydro recognizes that Aboriginal groups have expressed concerns with some of the effects assessment findings from Part B, and that Aboriginal groups have presented different views of the consequences of residual Project effects in their respective Part C contributions.

BC Hydro will continue to take into account information on issues and interests provided by Aboriginal groups during all phases of the EA process.

Based on the findings of the effects assessment provided in Part B and consideration of concerns identified in the Part C contributions of Schedule C Aboriginal groups, BC Hydro anticipates that adverse Project impacts to Aboriginal Interests will be mitigated or accommodated.

Table 11-10 provides links to Aboriginal groups' Part C presentation on characterization of residual effects on Aboriginal interests. The table provides a number of discreet and representative links to sections within the Nations' respective Part C chapters where characterization of residual effects are presented, (as identified by BC Hydro). The table should not be viewed as a complete reference to discussion of Aboriginal groups' perspectives on residual effects. To gain a better understanding of Aboriginal group perspectives each Aboriginal group's Part C contributions should be read in its entirety.

Table 11-10: Selected References to Aboriginal Groups' Characterization of Residual Effects on Aboriginal Interests

Aboriginal Groups Characterization of Residual Effects on Aboriginal Interests Selected References to Aboriginal Groups' Part C Contributions			
	Ktunaxa	**Okanagan Nation**	**Secwépemc**
Fishing	**C2.1:** Determination of Significance of Residual Project Effects on Water	**5.3.2.2.** Current Status of Fish and Okanagan Fishing in the Columbia River Basin	**Table 64:** Summary of Residual Effects of the Project on Secwepemc Title & Rights as Sites and Remains **Table 63:** Summary of Residual Effects of the Project on Secwepemc Title & Rights as they relate to Fishing, Plant and Medicine Gathering Areas and Hunting
Gathering	**C7.6:** Determination of Significance of Residual Project Effects on Lands and Resources	**6.** Okanagan Culture **7.3.3.2.** Ability to harvest adequate quality and quantity of traditional foods and medicines	**Table 63:** Summary of Residual Effects of the Project on Secwepemc Title & Rights as they relate to Fishing, Plant and Medicine Gathering Areas and Hunting
Hunting/ Trapping	**C7.6:** Determination of Significance of Residual Project Effects on Lands and Resources	**7.4.4.1.** Okanagan Terrestrial Livelihoods	**Table 63:** Summary of Residual Effects of the Project on Secwepemc Title & Rights as they relate to Fishing, Plant and Medicine Gathering Areas and Hunting (p 102)
Cultural Resources	**C3.5:** Traditional Knowledge and Language Sector: Significance of Residual Effects	**6.4.** Characterization of Rev6 Project-Specific Effects on Culture **6.4.2.** BC Hydro Committed-to Mitigation Measures re: Culture	**Table 62:** Summary of Residual Effects of the Project on Secwepemc Title & Rights as they relate to Archaeological they relate to Spiritual and Ceremonial Sites
Aboriginal Title and Rights	**C9:** Other Ktunaxa Nation Interests **C11:** Summary	**1.2.** Limitations of the Study Capacitor Station Impacts (p212)	**12.2.7.** Residual adverse effects (post mitigation) **Table 61:** Criteria for the Characterization of Residual Effects on Secwepemc Title and Rights

11.2.5 Summary of Outstanding Aboriginal Interests Identified by Aboriginal Groups

BC Hydro recognizes that Aboriginal groups have expressed long-standing concerns with all hydroelectric development on the Columbia River. Dams upstream and downstream of the Project have affected fish populations and fish habitat, terrestrial habitats, and traditional transportation routes. These adverse impacts include impacts on traditional and cultural pursuits, spirituality, community, health and wellbeing, and economy. Information on outstanding issues is provided in the respective Part C Aboriginal group

contributions. Table 11-11 provides a summary of outstanding Aboriginal interests identified by two or more Aboriginal groups as understood by BC Hydro.

Table 11-11: Summary of Outstanding Aboriginal Interests

Summary of Outstanding Aboriginal Interests
BC Hydro Facilities and Operations in the Columbia • Extent and magnitude of changes over time in the region have not been understood or adequately addressed, (cultural heritage, social and economic, environment and archaeology). • Nations have not been adequately compensated for past impacts. • Planning for Rev 6 is continuing while there are gaps and uncertainties concerning the ability to recognize and quantify past and ongoing impacts on Aboriginal interests.
Archaeology and Heritage Resources • There are ongoing concerns about potential negative impacts on village sites, grave sites, and sites of spiritual significance related to BC Hydro past and current operations, in part due to industrially regulated water levels in the Mid-Columbia Valley. • Concerns that the current "scientific" approach to categorization does not adequately capture or allow for a complete assessment of First Nation's perspectives.
First Nation World Views and Water Stewardship • Concerns that the current EA processes do not align with or accept as legitimate First Nations' holistic approaches to understanding and addressing the inter-relationship between biophysical and cultural issues. • Concerns that water in the Columbia Region is being managed for power generation and flooding control without due regard to Aboriginal governance and Aboriginal interests.

11.3 Other Matters of Concern to Aboriginal Groups

This section provides a summary of other matters of concern raised by Aboriginal groups that are not considered to pertain to Aboriginal Interests. This section is based on the assessment findings presented in Part B of this Application, and information exchanged during the Pre-Application consultation period. Table 11-12 presents a summary of other matters of concern identified by two or more Aboriginal groups, (as understood by BC Hydro).

Table 11-12: Summary of Other Matters of Concern to Aboriginal Groups

Summary of Other Matters of Concern to Aboriginal Groups		
Issue Concern or Interest	**BC Hydro Consideration/Response**	**Status/Resolution**
ENVIRONMENT		
Adequacy of Effects Assessment Concern that Part B effects assessment findings of limited potential Project effects do not reflect perceived potential effects of some community members. Concerns that non-measurable effects are underestimated when applied across ecosystems in the Mid-Columbia River.	The Part B effects assessment is a comprehensive assessment of measurable interactions between the Project and the VCs, including direct and indirect effects. Implementation of the Project would not result in changes to normal Revelstoke Reservoir or Arrow Lakes Reservoir operating ranges, and daily water level fluctuations would be similar to those of existing operations. While the assessment completed in Part B identified no significant residual effects for ecological VCs, BC Hydro acknowledges the potential for non-measurable effects, obscured by natural variability.	On-going discussions with First Nations, EAO, and BC Hydro regarding potential mitigation measures.
Stewardship and Conservation Concerns that not enough attention is being given to adopting adaptive management practices.	BC Hydro will continue to work with Aboriginal groups to discuss steps that can be taken to enhance environmental management and conservation initiatives.	Ongoing process of engagement and consultation.
Erosion Project increases to or changes in erosion and inundation zones could result in impacts to riparian vegetation, sensitive ecosystems, and heritage archaeological resources.	The Project will not affect riparian vegetation or sensitive ecosystems on a community level. Potential effects to known archaeological sites, and sites with identified high potential for archaeological resources were identified.	An iterative process of assessment for all sites has been initiated starting with high priority sites, and assessment will continue through the Project and BC Hydro's Reservoir Archaeology Program (RAP).
Salmon Restoration Interest in ensuring that the Project will not negatively affect the potential for re-introduction for salmon, by impairment of habitat or passage. Interested in taking steps to support restoring salmon to the Mid-Columbia River.	The Project's potential to affect fish passage was studied and found to be neutral, i.e. the Project would neither aid nor impair fish passage.	BC Hydro acknowledges the perspective of Aboriginal groups and is actively engaging with Aboriginal groups to better understand and address their concerns. The Canadian Columbia River Intertribal Fisheries Commission (CCRIFC) has proposed the formation of a multiagency committee to examine the feasibility of salmon restoration in the Columbia. BC Hydro has agreed to participate in such a committee.

Summary of Other Matters of Concern to Aboriginal Groups		
Issue Concern or Interest	**BC Hydro Consideration/Response**	**Status/Resolution**
ECONOMIC		
Aboriginal Economies Interested in maximizing the benefits of economic opportunities associated with the Project.	BC Hydro is committed to respecting and supporting the interests of Aboriginal communities.	Discussions ongoing concerning procurement, education and training opportunities related to the Project.
Revenues Request to provide estimates of anticipated revenue from the Project, the additional 3000 cfs water license, and the Revelstoke Dam and Generating Station as a whole.	At this time, BC Hydro does not report revenue on a per facility basis. The primary benefit of the Project is to provide additional capacity during peak demand periods for electricity. The additional 3000 cfs water license reflects greater efficiencies in the existing Unit 5 turbine and generator unit, and the potential Unit 6 turbine and generator unit. However, the anticipated amount of energy generated and revenue are not anticipated to be substantial, once fluctuation of market pricing and the likely infrequent use of additional generating capacity are factored.	No further action.
Procurement and Prequalification Requirement to improve access to opportunities and address barriers to procurement and contracting including consideration of BC Hydro and Contractor policies, cross-cultural training , unbundling opportunities; ongoing procurement monitoring tracking, and reporting, direct awards and competitive tenders, and preference measures.	BC Hydro acknowledges that there are potential barriers to Aboriginal procurement, and has developed an Aboriginal Procurement Policy. The Project will conform to this Policy and BC Hydro's agreements with Aboriginal Groups.	On-going discussions with First Nations, EAO, and BC Hydro regarding potential mitigation measures.
Employment Requirement to address barriers to employment including BC Hydro and Contractor hiring and human resource policies, along with housing and transportation challenges.	BC Hydro acknowledges that there are potential barriers to Aboriginal employment. BC Hydro has identified potential effects on housing affordability and availability during the Construction Phase of the Project. BC Hydro has proposed mitigation measures in Part B, Section 6.	BC Hydro is actively engaging with Aboriginal groups to better understand their concerns. BC Hydro will pursue negotiations with Aboriginal groups regarding proposed measures.
Monitoring Concerns that without adequate on-going monitoring barriers to employment and procurement will be perpetuated.	BC Hydro acknowledges that monitoring is a critical step in understanding and addressing barriers. BC Hydro will work with Aboriginal groups to institute an effective economic monitoring protocol.	BC Hydro is actively engaging with Aboriginal groups to better understand their concerns. BC Hydro will pursue negotiations with Aboriginal groups regarding proposed measures.

Summary of Other Matters of Concern to Aboriginal Groups		
Issue Concern or Interest	**BC Hydro Consideration/Response**	**Status/Resolution**
SOCIAL		
Community Wellbeing Project workers and their families could experience stress and disconnection from community supports during employment.	BC Hydro acknowledges the challenges of workers commuting to the work site, and is considering this in its early Project planning.	Project effects assessment complete. BC Hydro is actively engaging with Aboriginal groups to better understand their concerns. BC Hydro will pursue negotiations with Aboriginal groups regarding proposed measures.
Education and Training Concerns that lack of appropriate and timely education and training create barriers to Aboriginal groups meaningful participation in environmental, social, and economic initiatives.	BC Hydro acknowledges that education and training are often critical factors in accessing and qualifying for a variety of opportunities.	BC Hydro has proposed mitigation measures for local trades training in Part B, Section 6.
HERITAGE		
Archaeology and Heritage Resources Concerns that Archaeological resources are non-renewable and therefore any impacts are permanent. Interested in expansion of Reservoir Archeology Programs (RAP) to consideration of erosion and Aboriginal perspective for archeological sites. Aboriginal groups are interested in taking a greater role in the management of the RAP.	BC Hydro recognizes the concerns of Aboriginal groups regarding the non-renewable nature of archaeological resources. The RAP is currently in Phase 1 where work is being conducted to inventory protected heritage sites. Once this is complete a management plan will be developed with input from the Columbia Technical Working Group (TWG) that includes First Nations and BC Hydro.	Part B was amended to reflect the non-renewable nature of archaeological resources. Continuing related programs: Reservoir Archaeology Program Suggestions related to First Nation management of the RAP will be shared with the Columbia TWG.
Cultural Transmission and Heritage Concerns that past development in the region, with limited or no participation from Aboriginal groups has contributed to a cultural disconnect from the land and Aboriginal values. Concern that Rev 6 will not reverse this trend.	Where available TEK and TLUS have been used to inform the assessments	BC Hydro is actively engaging with Aboriginal groups to better understand their concerns. BC Hydro will pursue negotiations with Aboriginal groups regarding proposed measures.

Summary of Other Matters of Concern to Aboriginal Groups		
Issue Concern or Interest	**BC Hydro Consideration/Response**	**Status/Resolution**
HEALTH		
Human Health Concerns that the Project and overall hydroelectric development of the Columbia River could affect access to and the safety of traditional foods and medicines.	The Part B effects assessment considered potential effects to human health, and found the Project will not affect water quality, or the safety of traditional foods or medicines as operations will continue within the existing drawdown zone, and no vegetation outside the existing drawdown zone will be inundated and therefore no predicted effects from mercury ate anticipated during Project construction.	Project effects assessment complete. BC Hydro is actively engaging with Aboriginal groups to better understand their concerns. BC Hydro will pursue negotiations with Aboriginal groups regarding proposed measures.

11.3.1 Description of Other Matters of Concern to Aboriginal Groups

Aboriginal groups have provided details of other matters of concern beyond Aboriginal title, rights, and interests in their respective Part C contributions. Table 11-13 highlights key references to the discussion of other matters of concern in each Aboriginal groups Part C contribution, (as identified by BC Hydro). The table provides a number of discreet and representative links to sections within the Nations' respective Part C chapters where other matters of concern are described, (as identified by BC Hydro). The table should not be viewed as a complete reference to discussions related to other matters of concern. To gain a better understanding of Aboriginal group perspectives each Aboriginal group's Part C contributions should be read in its entirety.

Table 11-13: Other Matters of Concern to Aboriginal Groups: Selected References to Aboriginal Groups' Part C Contributions

Other Matters of Concern to Aboriginal Groups Selected References to Aboriginal Groups' Part C Contributions			
	Ktunaxa	**Okanagan Nation**	**Secwépemc**
General	**C9:** Other Ktunaxa Nation Interests	Pre-Amble (p 15) 3.3 Project Impact Pathways	Pre-Amble (p.i)
Environment	**C2:** Ktunaxa Title and Rights Water **C3:** Ktunaxa Title and Rights: Traditional Knowledge and Language **C6:** Ktunaxa Title and Rights Social Sector	**1.3.3.** Holistic Effects Assessment and the Critical Need to Establish Cumulative Effects Loading in the pre-Project Case **2.5.2.** Retrenching of Okanagan Stewardship Values **4.4.** Anticipated Project Effects on Water	**12.2.1.** Environmental Effects
Economic	**C4:** Ktunaxa Rights: Economic Investment Sector **C5:** Ktunaxa Rights: Education and Employment Sector	**8.** Livelihood & Economy	**12.2.2.** Economic Effects

Other Matters of Concern to Aboriginal Groups Selected References to Aboriginal Groups' Part C Contributions			
	Ktunaxa	**Okanagan Nation**	**Secwépemc**
Social	**C6:** Ktunaxa Title and Rights: Social Sector	**7.** Community Wellbeing	**12.2.3.** Social Effects
Heritage	**C3:** Ktunaxa Title and Rights: Traditional Knowledge and Language **C6:** Ktunaxa Title and Rights Social Sector **C7:** Ktunaxa Title and Rights Lands and Resources	**6.2.3.** Sense of place, spirituality and ceremonies **6.3.** Cumulative change over time on Okanagan Culture	**12.2.4.** Heritage Effects
Health	**C2:** Ktunaxa Title and Rights Water **C6:** Ktunaxa Title and Rights Social Sector **C7:** Ktunaxa Title and Rights Lands and Resources	**7.** Community Wellbeing	**12.2.5.** Health Effects

11.3.2 Summary of Mitigation Measures to Address Other Matters of Concern

Table 11-14 provides a summary of mitigation measures proposed by First Nations to avoid or reduce potential adverse Project effects on other matters of concern. Aboriginal groups provided these proposed measures in writing to BC Hydro. Secwepemc mitigation measures are presented in Section 12-h and 12.2.6 of their Part C contribution. Ktunaxa mitigation measures are included in Appendix C-I and Okanagan mitigation measures are included in Appendix Ca of this Application.

These proposed measures are preliminary, and were provided without prejudice, for the purposes of discussion. Final mitigation measures to be implemented for the Project will be determined and agreed to with BC EAO, affected First Nations, and BC Hydro.

Table 11-14: Mitigation Measures Identified by Aboriginal Groups to Avoid or Reduce Potential Adverse Effects on Other Matters of Concern to Aboriginal Groups

Mitigation Measures, Proposed by Aboriginal Groups, to Avoid or Reduce Potential Adverse Effects on Other Matters of Concern
ENVIRONMENT
Adequacy of Effects Assessment • Develop a strategy to include technical information gained from studies into ongoing operations that incorporate ecosystem function and protective measures. • Develop a comprehensive assessment of the operational impacts of the Rev 6 and **previous facilities** on anadromous Chinook and Sockeye Salmon spawning, rearing and migratory habitats. • Provide funding for a regional cumulative effects assessment on water and aquatic ecosystems. • Undertake studies to re-establish pre-dam habitat quality. • Undertake a data-gap assessment to better understand the potential level of impact of hydro facilities and operations on ecosystems and species.

Mitigation Measures, Proposed by Aboriginal Groups, to Avoid or Reduce Potential Adverse Effects on Other Matters of Concern
Stewardship and Conservation • In cooperation with First Nations develop bio-diversity management plans and fund Aboriginal groups' participation. • In cooperation with First Nations develop and implement Adaptive Management Plans and fund Aboriginal groups' participation. • Develop an Invasive Plant Management Plan. • Develop and maintain a bear-aware program around the Revelstoke Generation Station. • Restore and improve bio-diversity consistent with pre-development levels. • Support Aboriginal group members' education for environmental programs to support their involvement in the design and implementation of mitigation strategies.
Environmental Monitoring • Develop environmental monitoring plans and activities for the MCR. • Train and fund First Nation members to participate in environmental monitoring. • Support the implementation of water quality monitoring programs.
Erosion • Apply successional reclamation and biotechnical slope stabilization to prevent or limit erosion. • Follow-up and monitoring of peaking operation instantaneous discharge effects, and monitoring fine sediment erosion / deposition processes.
Fish Passage/ Restoration • Develop and implement a fish passage restoration plan. • Develop a comprehensive assessment of the operational impacts of the Revelstoke Generating station (Rev 6 and previous facilities) on anadromous Chinook and Sockeye Salmon spawning, rearing and migratory habitats (currently vacant), and the future potential ability to harvest salmon in the project area. • Submit a plan for mitigation or offset of any residual effects that will be implemented prior to salmon restoration above Grand Coulee Dam.
ECONOMIC
Revenues • Provide Nations with information on BC Hydro revenues and develop a revenue sharing model.
Procurement and Business Development • Develop framework that will outline procurement opportunities, business development and implementation between Aboriginal groups and BC Hydro. • Take steps to encourage Aboriginal procurement and develop Aboriginal business capacity including the consideration of seed funding for business development. • Review bid evaluation processes including the opportunity to include cultural and social 'fair market values' in bid evaluation, not just financial values.
Employment • Improve access to employment and retention of First Nation members including actions to address: o access to transportation o access to affordable accommodation o consideration of cost of living issues o access to community support services o recognition of non-formal education and training for experienced workers o access to mentorship, training, and education • Establish an Employment Committee or similar working group for Rev 6.

Mitigation Measures, Proposed by Aboriginal Groups, to Avoid or Reduce Potential Adverse Effects on Other Matters of Concern
• Establish an ongoing program to raise awareness of BC Hydro-related careers among Aboriginal youth. • BC Hydro to work closely with Aboriginal groups to provide on-the-job training or sponsorship of certification or re-certification for Aboriginal workers to fill educational or training gaps. • Strengthen cross cultural training initiatives.
Economic Monitoring and Reporting • Track, monitor, and report Aboriginal procurement, and employment targets and achievements (Rev 6 and other projects). • Fund Aboriginal group staff positions to manage Employment and Education programs, and monitor and report on recruitment, retention, and capacity.
SOCIAL
Community Wellbeing • Support assessment of individual and community wellbeing to inform the consideration and development of programs and projects that may impact communities. • Consider co-development of Socio-Economic Monitoring and Management Plan including Social Determinants of Health indicators. • Support community led initiatives to better inform and educate community members about environmental and social impact issues.
Human Health • Provide funding for the development and implementation of a plan to support confidence in water and wild food harvesting. • Develop eco-cultural restoration programs that address food security concerns.
HERITAGE
Archaeology and Heritage Resources • Fund community members' education and training for archaeology and anthropology programs. • Fund a Columbia Basin Heritage Management Board.
Cultural Transmission and Heritage • Support First Nation members in obtaining and practicing traditional skills in relation to conservation and stewardship initiatives. • Support initiatives that allow for better integration of traditional knowledge into conservation and management plans.

11.3.3 Characterization of Residual Adverse Effects on Other Matters of Concern

The final characterization of residual effects will be assessed based on final mitigation measures; however, Aboriginal groups have considered and identified potential adverse residual effects of the Project on other matters of concern to Aboriginal Groups after the application of mitigation measures in their respective Part C contributions.

Based on the findings of the effects assessment provided in Part B and consideration of concerns identified in the Part C contributions of Schedule C Aboriginal groups, BC Hydro anticipates that adverse Project impacts to Aboriginal Interests will be mitigated or accommodated.

BC Hydro recognizes that Aboriginal groups have expressed concerns with some of the effects assessment findings from Part B, and that Aboriginal groups have presented different views of the consequence of residual Project effects in their respective Part C contributions. Table 11-15 provides selected references to each Aboriginal groups Part C contribution, (as identified by BC Hydro).

BC Hydro will continue to take into account information on issues and Interests provided by Aboriginal groups during all phases of the EA process.

Table 11-15: Aboriginal Groups Characterization of Residual Adverse Effects on Other Matters of Concern- Selected References to Aboriginal Groups' Part C Contributions

Aboriginal Groups Characterization of Residual Adverse Effects on Other Matters of Concern Selected References to Aboriginal Groups' Part C Contributions			
	Ktunaxa	**Okanagan Nation**	**Secwépemc**
Environment	**Table C2.1:** Characterization of Residual Project Effects after mitigation on Ktunaxa Rights and Interest related to Napituk	**1.2.** Limitations of the Study **1.3.3.** Holistic Effects Assessment and the Critical Need to Establish Cumulative Effects Loading in the pre-Project Case **4.3.3.** Change Over Time on the Okanagan Water Valued Component **4.4.** Revelstoke 6 Project Effects on Okanagan Water Values	**Table 65:** Summary of Residual Effects of the Project on Secwepemc Title & Rights as they relate Access, Habitat Areas, Land and Resource Management **12.2.1.** Environmental Effects
Economic	**C4.4:** Residual Effects - Economic Investment Sector	**7.4.** Rev6 Project-Specific Effects Pathways on Syilx Livelihoods and Economy	**12.2.2.** Economic Effects
Social	**C5.2.4:** Residual Effects Education **C5.3.2:** Social Sector Residual Project Effects Assessment	**8.3.2. Okanagan Well-being Today** **8.3.3.** Discussion of Cumulative effects to Date on Okanagan Community Well-being	**12.2.3.** Social Effects **12.2.4.** Heritage Effects
Health	**C11:** Summary	**8.3.2.2.** Physical and Mental Health	**12.2.5.** Health Effects

11.4 Issue Summary Table

The issues noted in the tables below have been raised in a number of forums including Revelstoke 6 Project working groups, Core Committee meetings, one-on-one meetings with Chief and Council, community and Aboriginal group representatives, written correspondence, reviews and comments on studies, including the draft Application Information Requirements (dAIR) and Valued Components. BC Hydro has responded to all the issues and concerns raised.

Additional mitigations for potential effects to Terrestrial and Socio-Economic VCs may overlap and be applied to Aboriginal Issues. These are provided in Part B.

Table 11-16: Issue Summary Table Ktunaxa Nation Council

Aboriginal Group: Ktunaxa Nation Council					
Consultation Stage / Information Source	Issue Aboriginal Interest	Issue – Other Matters of Concern	Analysis of Potential Effect	Proposed Measures to Avoid, Mitigate or Otherwise Manage Effects	Status of Issue *(e.g. resolved, ongoing resolution, referred to agency, etc.)*
Pre-Application/EA Draft Multiple meetings Letter(s)	Right to Fish Loss of fishing areas and opportunities. Loss of use of traditional resources.	• Water and Land Stewardship o Salmon and White Sturgeon o Re-establishing seasonal flows o Project design o Operations - implement natural hydrograph o Adaptive Management o Cumulative Effects o Transmission of TEK	Daily peaking resulting in increased peak inundation, velocity, and erosion in the MCR and increased variation in the RR; increased freeze-thaw cycling; and legacy effects from previous BC Hydro projects and operations. Resulting in: Impacts on Ktunaxa title, rights and interests, including water stewardship, cultural practice (e.g. Salmon and sturgeon harvest), and transmission of knowledge.	• Full Ktunaxa partnership in the Fish and Wildlife Compensation Program. • Comprehensive monitoring, restoration and adaptive management plan for potential or anticipated Revelstoke 6 operational impacts on fish, aquatics and riparian areas. • Jointly develop a comprehensive assessment of the operational impacts of the Rev 6 and previous facilities on anadromous Chinook and Sockeye Salmon spawning, rearing and migratory habitats (currently vacant). • Conduct an evaluation of opportunities for mitigation of existing impacts to fish and fish habitat through modification of the Revelstoke 6 project design. • Jointly develop a strategy to include technical information gained from studies into ongoing operations that incorporate	Ongoing resolution at various tables between BC Hydro and KNC, and with other parties as required. While BC Hydro has not identified potential Project effects for fish and fish habitat, it acknowledges the perspective of KNC and is actively engaging with KNC to better understand their concerns. BC Hydro will pursue negotiations with KNC regarding proposed measures.

Aboriginal Group: Ktunaxa Nation Council					
Consultation Stage / Information Source	Issue Aboriginal Interest	Issue – Other Matters of Concern	Analysis of Potential Effect	Proposed Measures to Avoid, Mitigate or Otherwise Manage Effects	Status of Issue *(e.g. resolved, ongoing resolution, referred to agency, etc.)*
				ecosystem function and protective measures for Ktunaxa title and rights (re-establishing seasonal and emulate natural or pre-development hydrologic conditions).	
Pre-Application/EA Draft Multiple meetings Letter(s)	Right to Harvest Loss of plant harvesting areas and opportunities. Use of traditional resources. Right to Use Spiritual /Traditional Sites Loss of medicine gathering sites and opportunities.	• Water Wild Foods and Confidence o Access and navigation o Methyl mercury and cultural contaminants o Erosion and deposition o Velocity o Cumulative effects o Transmission of TEK • Community Well Being	Daily peaking resulting in increased peak inundation, velocity, and erosion in the MCR and increased variation in the RR; increased freeze-thaw cycling; legacy effects from previous BC Hydro projects and operations. Resulting in: Reduced Ktunaxa confidence in accessing water and aquatic resources in the MCR and downstream. Impacts on Ktunaxa title, rights and interests, including reduced opportunities for cultural practice, transmission of place specific knowledge, and harvest practices on the MCR.	• Provide annual support to Ktunaxa Nation Council for a plan to support confidence in water and wild food harvesting in Mi¢'qaqas ʔamakʔis.	Ongoing resolution at various tables between BC Hydro and KNC, and with other parties as required. While BC Hydro has not identified potential Project effects on Aboriginal groups' right to harvest or use spiritual / traditional sites, it acknowledges the perspective of KNC and is actively engaging with KNC to better understand their concerns. BC Hydro will pursue negotiations with KNC regarding proposed measures.
Pre-Application/EA Draft Multiple meetings Letter(s)	Right to Use Spiritual /Traditional Sites Use of traditional resources. Rights to Harvest	• Cultural Transmission and Management o Heritage Resources o Archaeology erosion protection o Guardian Watchman o Language use and preservation	Daily peaking resulting in increased peak inundation, velocity, and erosion in the MCR and increased variation in the RR; increased freeze-thaw cycling; legacy effects from previous BC Hydro projects and operations. Resulting in: Increased erosion of	• Provide annual support to KNC for the lifetime of the project to develop and implement a Revelstoke Dam and Reservoir Cultural Management Plan to be implemented during construction, operations, closure	Ongoing resolution at various tables between BC Hydro and KNC, and with other parties as required. BC Hydro has identified potential Project effects to archaeological sites

Aboriginal Group: Ktunaxa Nation Council					
Consultation Stage / Information Source	Issue Aboriginal Interest	Issue – Other Matters of Concern	Analysis of Potential Effect	Proposed Measures to Avoid, Mitigate or Otherwise Manage Effects	Status of Issue *(e.g. resolved, ongoing resolution, referred to agency, etc.)*
		o Navigation o Cumulative Effects • Community Well Being	shorelines and riparian areas including archaeological and cultural properties. Reduced Ktunaxa confidence in practicing rights (e.g. navigation, fishing) and fewer opportunities for transmitting knowledge on the MCR, RR, and downstream. Impacts on Ktunaxa title, rights and interests, including reduced cultural practice, reduced transmission of place-specific knowledge, and reduced harvest practices on the MCR and RR.	and reclamation.	through increased erosion. BC Hydro has proposed mitigation measures in Part B, Section 7, and is actively engaging with KNC and other affected Aboriginal Groups to develop culturally appropriate approaches and mitigation measures.
Pre-Application/EA Draft Multiple meetings Letter(s)	Right to Harvest Loss of plant harvesting areas and opportunities.	• Stewardship and Conservation o TEK/TLUS o Biodiversity o Guardian Watchman o Ice, erosion protection / bank stabilization o Restoration of pre-dam conditions	Daily peaking resulting in increased peak inundation, velocity, and erosion in the MCR and increased variation in the RR; increased freeze-thaw cycling; legacy effects from previous BC Hydro projects and operations. Results in increased erosion of shorelines, riparian areas and habitats and associated impacts on water, aquatic resources and terrestrial resources and biodiversity in the MCR and downstream. Results in impacts on Ktunaxa title, rights and interests, including stewardship of 'all living things', sense of place, and transmission of knowledge.	• Provide funds and annual support for the lifetime of the Project for ongoing Ktunaxa stewardship of Mi¢'qaqas ?amak?is (conservation of aquatic and terrestrial biodiversity and ongoing guardian monitoring program). • Establish a Biodiversity Management Plan, Bird Management Plan, Invasive Plant Management Plan, Wildlife Mitigation Management Plan, Erosion Mitigation Plan, and Restoration and Stabilization Plan, or equivalent document(s). • Provide funding for KNC to research impacts to terrestrial	Ongoing resolution at various tables between BC Hydro and KNC, and with other parties as required. While BC Hydro has not identified potential Project effects on plant harvesting areas within KNC's asserted territory, it acknowledges the perspective of KNC and is actively engaging with KNC to better understand their concerns. BC Hydro will pursue negotiations with KNC regarding proposed measures.

Aboriginal Group: Ktunaxa Nation Council					
Consultation Stage / Information Source	Issue Aboriginal Interest	Issue – Other Matters of Concern	Analysis of Potential Effect	Proposed Measures to Avoid, Mitigate or Otherwise Manage Effects	Status of Issue *(e.g. resolved, ongoing resolution, referred to agency, etc.)*
				wildlife and vegetation related to management of flows on the MCR, ALR and RR.	
Pre-Application/EA Draft Multiple meetings Letter(s)		• Economic Development o Accounting of value of resources extracted and Rights based economy o Economic investment • Community Well Being	Project use and occupation of valuable water resources within Ktunaxa ʔamakʔis by BC Hydro. Results in ongoing Ktunaxa exclusion from benefits of previous BC Hydro projects and operations. Results in erosion or displacement of current and future Ktunaxa economic options and potential. Results in continuation of colonial effects and inequities related to lack of recognition of Ktunaxa rights and title.	• Provide an accounting of revenues generated by BC Hydro operations in Ktunaxa ʔamakʔis. • Support KNC efforts to receive a share of the revenues collected from BC from hydro-electric activity in Ktunaxa ʔamakʔis (develop a revenue sharing model).	Revenue sharing is a Provincial jurisdiction, and is outside BC Hydro's mandate or authority to address.
Pre-Application/EA Draft Multiple meetings Letter(s)		• Economic Development o Procurement and prequalification o Procurement communication o Procurement general • Socio Economic Monitoring	A high risk that Ktunaxa businesses will be excluded from the project. Results in economic benefits of the Project not realized by Ktunaxa business and members.	• Jointly develop framework that will outline procurement opportunities, business development and implementation between KNC and BCH for the life of the project. • Facilitate Ktunaxa business development and access to contracting opportunities. • Engage directly with KNC procurement personnel to expand contracting opportunities with Ktunaxa businesses: (cross-cultural training, unbundling opportunities; ongoing procurement	BC Hydro acknowledges that there are potential barriers to Aboriginal procurement, and has developed an Aboriginal Procurement Policy. The Project will conform to this Policy, and BC Hydro's agreements with Aboriginal Groups.

Aboriginal Group: Ktunaxa Nation Council					
Consultation Stage / Information Source	Issue Aboriginal Interest	Issue – Other Matters of Concern	Analysis of Potential Effect	Proposed Measures to Avoid, Mitigate or Otherwise Manage Effects	Status of Issue *(e.g. resolved, ongoing resolution, referred to agency, etc.)*
				monitoring tracking, and reporting, direct awards and competitive tenders, preference measures). • Jointly develop a socio-economic and procurement monitoring and management plan for BC Hydro operations. • Identify/address barriers and challenges to securing procurement or employment opportunities.	
Pre-Application/EA Draft		• Transportation and Housing • Community Well Being	The project is anticipated to impact on the availability and cost of housing in the Revelstoke area. Results in perpetuating barriers to employment for Ktunaxa citizens.	• Jointly identify and fund potential transportation and housing opportunities to improve service for Ktunaxa citizens employed by BC Hydro through the Project (set aside affordable housing covering housing costs for the first 2 weeks, assist in initial transportation and demarcation costs, and assist in additional family/community arrangements.	BC Hydro has identified potential effects on housing affordability and availability during the Construction Phase of the Project. BC Hydro has proposed mitigation measures in Part B, Section 6, and is actively engaging with KNC to better understand their concerns. BC Hydro will pursue negotiations with KNC regarding proposed measures.
Pre-Application/EA Draft		• Education and Training	Project impacts on Ktunaxa education and training can be expected to be negative and of low magnitude, as the Project would likely continue the pattern set by previous BC Hydro projects. Results in maintaining or	• BC Hydro will continue engagement with KNC in strategic planning for education and training. • Implementation of an annual contribution to a Training Resources	BC Hydro acknowledges that there are potential barriers to Aboriginal employment. BC Hydro has proposed mitigation measures for local

Aboriginal Group: Ktunaxa Nation Council					
Consultation Stage / Information Source	Issue Aboriginal Interest	Issue – Other Matters of Concern	Analysis of Potential Effect	Proposed Measures to Avoid, Mitigate or Otherwise Manage Effects	Status of Issue *(e.g. resolved, ongoing resolution, referred to agency, etc.)*
			intensify economic disparities between Ktunaxa and non-Ktunaxa in the region.	Fund. • Recognition of non-formal education and training as equivalent to educational requirements for mature workers with extensive workplace experience • . • Establishment of an equipment fund for Ktunaxa hires. • Accommodation of interrupted employment histories and requirements waived (recognize cultural context for seasonal employment). • Funding of a Ktunaxa education and employment staff positions (FTE) to support the project and Ktunaxa hires.	trades training in Part B, Section 6, and is actively engaging with KNC to better understand their concerns. BC Hydro will pursue negotiations with KNC regarding proposed measures.
Pre-Application/EA Draft		• Employment	Continued use of current BC Hydro employment policies. Results in a high risk that Ktunaxa citizens and businesses will be excluded from the economic benefits of the project.	• Set direct Project employment targets with consequences for non-achieving. • Provide regular reporting on hire targets; additional modifications will be implemented to address barriers. • Establish a process to allow for identification of Ktunaxa applications, (consideration of employment barriers and commitment to	BC Hydro acknowledges that there are potential barriers to Aboriginal employment. BC Hydro is committed to equity employment, and clauses regarding this are included in the Columbia Hydroelectric Contractors (CHC) Agreement, which will govern employment for the

Aboriginal Group: Ktunaxa Nation Council					
Consultation Stage / Information Source	Issue Aboriginal Interest	Issue – Other Matters of Concern	Analysis of Potential Effect	Proposed Measures to Avoid, Mitigate or Otherwise Manage Effects	Status of Issue *(e.g. resolved, ongoing resolution, referred to agency, etc.)*
				seek and support resources or other accommodation solutions to the barriers). • Provision of feedback to the applicants who are not hired (recommendations for reconsideration and referral to the KNC-EE Employment Support Worker to potentially access BCH supported training funds). • Jointly establish a program to improve the work culture and support retention and advancement of Ktunaxa workers.	majority of the work to be completed for the Project. Beyond the Project, BC Hydro is actively engaging with KNC to better understand their concerns, and will pursue negotiations with KNC regarding proposed measures.

Table 11-17: Issue Summary Table Okanagan Nation

Aboriginal Group: Okanagan Nation					
Consultation Stage / Information Source	Issue – Aboriginal Interest	Issue – Other Matters of Concern	Analysis of Potential Effect	Proposed Measures to Avoid, Mitigate or Otherwise Manage Effects	Status of Issue *(e.g. resolved, ongoing resolution, referred to agency, etc.)*
Pre-Application/EA Draft Multiple meetings Letter(s)	Traditional Land and Resource Use Loss of cultural and spiritual enjoyment. Right to Use Spiritual /Traditional Sites Use of traditional resources. Right to Hunt Right to Fish	• General and cross-cutting mitigation, monitoring and compensatory measures. o Ongoing environmental and archaeological management • Healthy Water (m1.) o Recognition of and promotion of Syilx water rights and responsibilities	Cumulative effects from previous BC Hydro projects and operations. Increase in intensity of maximum water releases at the base of the Revelstoke Dam to up to a sought regulated maximum of 93,000 cfs. Results in increasing the already high level of artificial regulation of water in the Columbia River Basin. Results in adverse effects on Okanagan water stewardship and desired restoration and protection of aquatic ecosystems.	• BC Hydro to provide adequate capacity for Okanagan Nation member bands to have meaningful involvement in the development of environmental management and environmental or archaeological monitoring activities • Adopting requirements for pre-, during and post-construction Syilx community environmental monitoring at all Project-related physical works and activities. • BC Hydro and Provincial commitment to put Syilx at the forefront of all siwɬkʷ planning, siwɬkʷ protection, and siwɬkʷ operational processes, including decisions on allocation and generation.	Ongoing resolution at various tables between BC Hydro and ON, and with other parties as required. BC Hydro has identified potential Project effects to archaeological sites through increased erosion. BC Hydro has proposed mitigation measures in Part B, Section 7, and is actively engaging with ON and other affected Aboriginal Groups to develop culturally appropriate approaches and mitigation measures. While BC Hydro has not identified potential Project effects on Aboriginal groups' right to fish or use spiritual / traditional sites, it acknowledges the perspective of ON and is actively engaging with ON to better understand their concerns. BC Hydro will pursue negotiations with ON regarding proposed measures.

Aboriginal Group: Okanagan Nation					
Consultation Stage / Information Source	Issue – Aboriginal Interest	Issue – Other Matters of Concern	Analysis of Potential Effect	Proposed Measures to Avoid, Mitigate or Otherwise Manage Effects	Status of Issue *(e.g. resolved, ongoing resolution, referred to agency, etc.)*
Pre-Application/EA Draft Multiple meetings Letter(s)	Traditional Land and Resource Use Loss of cultural and spiritual enjoyment. Right to Fish	• Support for Okanagan water and wetland monitoring o Water quality of the reservoir o Seasonal hydrological flows o Erosion o Fuel storage	Higher discharge rates, alterations in water levels at peaking and erosion and flooding. Results in greater fluctuations in water levels in some of the lower wetlands of the Mid Columbia River.	• Collaboratively develop Water and Wetlands Monitoring and Management Program. • Train and fund positions for two Okanagan Nation water and wetland monitoring positions. • Improve the dam operations for the management of water velocity and seasonal fluctuations.	Ongoing resolution at various tables between BC Hydro and ON, and with other parties as required. BC Hydro operates Revelstoke Dam to satisfy its obligations to the Province to reliably produce power safely and satisfy commitments under the Columbia River Treaty. While BC Hydro has not identified potential Project effects for fish and fish habitat or use of Aboriginal Groups' spiritual sites, it acknowledges the perspective of ON and is actively engaging with ON to better understand their concerns. BC Hydro will pursue negotiations with ON regarding proposed measures.

Aboriginal Group: Okanagan Nation					
Consultation Stage / Information Source	Issue – Aboriginal Interest	Issue – Other Matters of Concern	Analysis of Potential Effect	Proposed Measures to Avoid, Mitigate or Otherwise Manage Effects	Status of Issue *(e.g. resolved, ongoing resolution, referred to agency, etc.)*
Pre-Application/EA Draft	Traditional Land and Resource Use Right to Harvest Traditional Plants Loss of medicine gathering sites and opportunities. Loss of cultural and spiritual enjoyment.	• Habitat compensation, restoration and monitoring o Preservation of natural habitats o Recreation sites o Reintroduction of native plants, medicines and historical grasses o TEK	Disturbance and/or loss of lands, food and medicinal plants from road building, introduction of non-native invasive weeds and use of herbicides adjacent to reservoir, roads and construction sites. Lack of integration of Syilx traditional knowledge and perspectives on wetlands management. Increased opening of Syilx Territory to recreational use, including lack of respect and protocol shown for land, water, resources and cultural/spiritual sites. Increased risk of industrial accidents, including appropriate mechanisms for avoidance, mitigation, and compensation for impacts; and liability and responsibility for damages and ecosystem recovery. Interference with traditional hunting and plant harvesting areas, including reduction in likelihood of harvesting success in the Project area.	• Develop and implement a Wetlands Management Plan including culturally-appropriate wetland monitoring measures. • Develop an Aquatic Habitat Restoration Plan.	Ongoing resolution at various tables between BC Hydro and ON, and with other parties as required. While BC Hydro has not identified potential Project effects to wetlands, it acknowledges the perspective of ON and is actively engaging with ON to better understand their concerns. BC Hydro will pursue negotiations with ON regarding proposed measures.

Aboriginal Group: Okanagan Nation					
Consultation Stage / Information Source	Issue – Aboriginal Interest	Issue – Other Matters of Concern	Analysis of Potential Effect	Proposed Measures to Avoid, Mitigate or Otherwise Manage Effects	Status of Issue *(e.g. resolved, ongoing resolution, referred to agency, etc.)*
Pre-Application/EA Draft	Traditional Land and Resource Use Loss of cultural and spiritual enjoyment. Right to Fish	• Habitat compensation, restoration and monitoring o Reintroduction of salmon	Impacts on water, watersheds and water crossings, including wetlands, drainages, groundwater, drinking water, and everything that relies upon those watersheds, such as fish, wildlife, birds, deer, moose (i.e., changes in the abundance, distribution and population health of these critical species). Continuation and exacerbation of change from a natural ecological flow regime with one managed by humans, contrary to Syilx laws, norms and guiding principles.	• Develop an Aquatic Habitat Restoration Plan.	BC Hydro has not identified potential Project effects to the suitability of aquatic habitat for salmon; however, BC Hydro acknowledges the perspective of ON and is actively engaging with ON to better understand their concerns. BC Hydro will pursue negotiations with ON regarding proposed measures. Revelstoke Unit 6 Project activities and operations will not preclude the ongoing potential for future fish passage or fish resource use of concern to First Nations. The Canadian Columbia River Intertribal Fisheries Commission (CCRIFC) has proposed the formation of a multiagency committee to start investigating the feasibility of salmon restoration in the Columbia. BC Hydro has agreed to participate in such a committee should it proceed.

Aboriginal Group: Okanagan Nation					
Consultation Stage / Information Source	Issue – Aboriginal Interest	Issue – Other Matters of Concern	Analysis of Potential Effect	Proposed Measures to Avoid, Mitigate or Otherwise Manage Effects	Status of Issue *(e.g. resolved, ongoing resolution, referred to agency, etc.)*
Pre-Application/EA Draft Multiple meetings Letter(s)	Traditional Land and Resource Use Right to Harvest	• Erosion-related mitigation and monitoring o Predicted and realised impacts from Unit 5 o Channel scour and stability o Shear stress or water level fluctuation	Increased erosion risk in the MCR area may lead to speeding up of changes both in the river bottom (affecting navigability) and shoreline). Instantaneous discharge effect on bed and bank erosion, freeze-thaw, and water quality. Resulting in : Impacts on native plant community establishment, including presence and abundance of cultural and medicinal use plants. Further reducing already constrained accessibility and willingness of Okanagan harvesters to use the area.	• Follow-up and monitoring of peaking operation instantaneous discharge effects, and monitoring fine sediment erosion / deposition processes. • Protect bed and/or bank in river stretches. • Apply successional reclamation and biotechnical slope stabilization to prevent or limit erosion.	While BC Hydro has not identified potential Project effects to terrestrial or aquatic harvest sites, or access to these sites, through increased erosion, it acknowledges the perspective of ON and is actively engaging with ON to better understand their concerns. BC Hydro will pursue negotiations with ON regarding proposed measures.
Pre-Application/EA Draft Multiple meetings Letter(s)	Traditional Land and Resource Use Loss of cultural and spiritual enjoyment. Right to Hunt Right to Fish	• Cumulative Effects Assessment and Management o Climate Change o Data gaps o Habitat loss	Cumulative effects from previous BC Hydro projects and operations and Project-specific effects has not been addressed. Resulting in: Ongoing impacts on Syilx culture, traditions, and ways of life, and associated rights and interests.	• Provide funding for a regional cumulative effects assessment on water and aquatic ecosystems. • Support an Okanagan cumulative effects study in the Revelstoke and Upper Arrow watersheds and Capacitor Station. • Undertake studies to re-establish pre-dam habitat quality.	BC Hydro has assessed cumulative effects according to BC EAO guidelines. BC Hydro it acknowledges the perspective of ON and is actively engaging with ON to better understand their concerns.

Aboriginal Group: Okanagan Nation					
Consultation Stage / Information Source	Issue – Aboriginal Interest	Issue – Other Matters of Concern	Analysis of Potential Effect	Proposed Measures to Avoid, Mitigate or Otherwise Manage Effects	Status of Issue *(e.g. resolved, ongoing resolution, referred to agency, etc.)*
Pre-Application/EA Draft Multiple meetings Letter(s)	Right to Fish Loss of cultural and spiritual enjoyment.	• Fish and Fishing o Water quality o Reservoir fluctuations and flow regimes o Fish restoration o Fish stranding o Fish habitat o Fish passage o Reduced food security • Safety	Changes in the frequency and magnitude of daily water level fluctuations, increased maximum unit capacity, increased bank incisement, turbidity and changes in water temperature. Resulting in: Effects on production, increased fish stranding risks, and adverse habitat loss. Impacts on the distribution and abundance of preferred and culturally important fish species. Reduced access to preferred fishing sites and increased safety issues on the water. Reduced fishing success in the MCR and consequently food security.	• Develop and implement a fish passage restoration plan, and an Environmental Management Plan. • Fish Monitoring Program Enhancements (Life of Project). • Develop a fish and fish habitat community research partnership. • Fund Okanagan-commissioned studies involving Elders and traditional land and resource users to study cumulative change. • Develop a pre-industrial baseline. • Develop measures to enhance economic and food security outcomes.	Ongoing resolution at various tables between BC Hydro and ON, and with other parties as required. BC Hydro has identified potential small magnitude changes to water elevations to Arrow Lakes Reservoir; however, Revelstoke Dam will continue to operate as a peaking plant, and downstream flow regimes will remain unchanged. While BC Hydro has not identified potential Project effects for water quality, fish restoration, fish stranding, fish habitat, fish passage, and reduced food security, it acknowledges the perspective of ON and is actively engaging with ON to better understand their concerns. BC Hydro will pursue negotiations with ON regarding proposed measures.

Aboriginal Group: Okanagan Nation					
Consultation Stage / Information Source	Issue – Aboriginal Interest	Issue – Other Matters of Concern	Analysis of Potential Effect	Proposed Measures to Avoid, Mitigate or Otherwise Manage Effects	Status of Issue *(e.g. resolved, ongoing resolution, referred to agency, etc.)*
Pre-Application/EA Draft Multiple meetings Letter(s)	Right to Hunt Right to Harvest Right to Harvest Traditional Plants Loss of medicine gathering sites and opportunities. Loss of cultural and spiritual enjoyment Transmission of TEK.	• Cultural and Heritage Resources o Site specific impacts o Protection of burial sites o Erosion/Project activities o Increased human access and use o Ongoing environmental and archaeological management • Noise	Effects of changing water and hydrological regimes; and, Clearing, construction, and operation of the capacitor station leading to altered landscapes. Resulting in: Construction noise and activities that will decrease return on effort for harvesting in both respective LSAs for the duration of the construction phase. Reduced ability to harvest adequate quality and quantity of traditional foods and medicine. Syilx members from being less inclined to practice traditional activities in this area and members' ability to understand and navigate their cultural landscape. Reduced inter-generational engagement (youth and elders) and the transfer of knowledge of the values and responsibilities of – sharing and ceremony. increased risks to archaeological and/or burial sites on Syilx historical sites and ancestral remains. Diminished ability to protect and	• Develop and fund an Elder's Action Committee for managing ancestors. • Develop, implement, and fund a guardian archaeology watchmen program. • Stabilize water levels to reduce exposure of sites. • BC Hydro to share AIA's with Okanagan Nation Bands and involves Okanagan Nation in the survey work. • Develop an Okanagan Nation Use Area Protection Plan for both key Project Locations. • Penticton Indian Band Monitoring Program for Summerland Capacitor Station. • Supporting the Okanagan Nation to assist and mentor community members in obtaining and practising traditional and academic skills in fish, wildlife and land stewardship and care. • Develop appropriate buffer zones around areas of cultural and spiritual practice, in consultation with Okanagan Nation, to mitigate the effects of noise and other effects from the Project.	Ongoing resolution at various tables between BC Hydro and ON, and with other parties as required. BC Hydro has identified potential Project effects to archaeological sites through increased erosion. BC Hydro has proposed mitigation measures in Part B, Section 7, and is actively engaging with ON and other affected Aboriginal Groups to develop culturally appropriate approaches and mitigation measures. Construction work will result in temporary increases to noise near the Transmission and Generation LSAs; however, BC Hydro has not identified potential effects related to noise at either LSA. BC Hydro acknowledges the perspective of ON and is actively engaging with ON to better understand their concerns. BC Hydro will pursue negotiations with ON regarding

Aboriginal Group: Okanagan Nation					
Consultation Stage / Information Source	Issue – Aboriginal Interest	Issue – Other Matters of Concern	Analysis of Potential Effect	Proposed Measures to Avoid, Mitigate or Otherwise Manage Effects	Status of Issue *(e.g. resolved, ongoing resolution, referred to agency, etc.)*
			respectfully manage burial and other archaeological sites.	• Include Okanagan Nation members in environmental and archaeological and cultural heritage monitoring during and after construction activities for the life of the dam. • BC Hydro to support development of an Okanagan culture and heritage restoration program (and cultural camps). • Develop "cultural offsets" programs.	proposed measures.
Pre-Application/EA Draft Multiple meetings Letter(s)	Traditional Land and Resource Use Loss of cultural and spiritual enjoyment.	• Community Well Being o Cumulative impacts	Effects of past BC Hydro development and Project on water. Resulting in: Impacts on all aspects of Okanagan livelihoods, culture, and wellbeing.	• Support for social programs that offset social and economic impacts associated with cumulative effects on well-being.	Ongoing resolution at various tables between BC Hydro and ON, and with other parties as required. BC Hydro has identified temporary and low magnitude cumulative effects for socio-community, and has proposed mitigation measures in Part B, Section 6. BC Hydro acknowledges the perspective of ON and is actively engaging with ON to better understand their concerns. BC Hydro will pursue negotiations with ON regarding proposed measures.

Aboriginal Group: Okanagan Nation					
Consultation Stage / Information Source	Issue – Aboriginal Interest	Issue – Other Matters of Concern	Analysis of Potential Effect	Proposed Measures to Avoid, Mitigate or Otherwise Manage Effects	Status of Issue *(e.g. resolved, ongoing resolution, referred to agency, etc.)*
Pre-Application/EA Draft Multiple meetings Letter(s)	Right to Hunt and Trap	• Livelihoods and Economy • Workforce recruitment and retention • Increased human access and use • Bio-diversity o Adaptive management plans o Habitat restoration - painted turtle o Site restoration o Wetlands • Transmission of TEK	Higher discharge rates, alterations in water levels at peaking and erosion and flooding. Resulting in: Increased negative effects on the surrounding ecosystems such as effects on nesting birds. Greater fluctuations in water levels in some of the lower wetlands of the Mid Columbia River.	• Develop and implement an Environmental Management Plan. • Develop a protocol to avoid impacting wildlife during their critical seasonal activities. • Implement a monitoring and adaptive management plan to address negative changes in wildlife movement patterns and habitat use. • Employ TEK and emerging techniques in disturbed site restoration. • Develop of a protocol to avoid impacting wildlife during their critical seasonal activities. • Design and implement meaningful wetland restoration/creation and habitat structural enhancement projects in Revelstoke Reach. • Design and implement a long-term (10+ years) monitoring program of invertebrate. • Carry on monitoring and assessment the Revelstoke Reach painted turtle population for another 10+ years. • Design and implement a rehabilitation,	BC Hydro acknowledges that there are potential barriers to Aboriginal employment. BC Hydro has proposed mitigation measures for local trades training in Part B, Section 6, and is actively engaging with ON to better understand their concerns. While BC Hydro has identified potential terrestrial ecosystem effects in the footprint of the Capacitor Station in the Transmission LSA, it has not identified other terrestrial or aquatic ecosystem effects related to increased human access or use. BC Hydro has not identified potential Project effects to wetlands, wildlife populations, or biodiversity. BC Hydro acknowledges the perspective of ON and is actively engaging with ON to better understand their concerns. BC Hydro will pursue negotiations with ON regarding proposed

Aboriginal Group: Okanagan Nation					
Consultation Stage / Information Source	Issue – Aboriginal Interest	Issue – Other Matters of Concern	Analysis of Potential Effect	Proposed Measures to Avoid, Mitigate or Otherwise Manage Effects	Status of Issue *(e.g. resolved, ongoing resolution, referred to agency, etc.)*
				restoration and biodiversity improvement plan for areas disturbed by Rev 6 activities. • Consulting with Okanagan Nation and knowledge holders to determine wildlife habitat values and wildlife activity, and in dealing with wildlife-related issues. • Continue CLBMON33/12 monitoring of plant communities in the DDZ at landscape and site levels. • Ensure ongoing monitoring of migratory birds • Develop an eco-cultural restoration programs. • Create and implement work force recruitment and retention plan for Okanagan. • Enhance procurement opportunities for Okanagan businesses. • Undertake skills training & employment readiness.	measures.

Table 11-18: Issue Summary Table Secwepemc

Aboriginal Group: Secwepemc					
Consultation Stage / Information Source	Issue – Aboriginal Interest	Issue – Other Matters of Concern	Analysis of Potential Effect	Proposed Measures to Avoid, Mitigate or Otherwise Manage Effects	Status of Issue *(e.g. resolved, ongoing resolution, referred to agency, etc.)*
Pre-Application/EA Draft Multiple meetings Letter(s)	Right to Fish Loss of fishing areas and opportunities. Use of Traditional Resources.	• Salmon extirpated and sturgeon endangered. • Community well-being. • Heritage Resources	The effects of existing hydro activities in the Upper Columbia River Valley has an adverse and ongoing effect on Secwepemc people's fishing areas and opportunities as fishing pressure has increased for less abundant and varied food resources, and the health and quantity of the aquatic ecosystem has been compromised. Ongoing changes effecting quality and quantity of water moving through the system including changes in velocity and thermal regimes and requirement to address related/relevant data gaps. Resulting in: Impacts on habitat/suitability fish passage, fish entrainment at the population level, genetic diversity and population viability, productivity, community structure and food-web dynamics.	• Conduct a Secwepemc CHA. • Expedite implementation of current mitigation strategies. • Secure and purchase ecologically significant lands within the LSA for conservation, enhancement and stewardship activities. • Fund Secwepemc community member's education for environmental programs. • Fund and implement a Columbia Basin Cultural Heritage Management. • Complete, a compensation agreement that fully addressed the non-mitigable impacts to non-archaeological cultural heritage resources.	Ongoing resolution at various tables between BC Hydro and Secwepemc, and with other parties as required. While BC Hydro has not identified potential Project effects for fish and fish habitat, it acknowledges the perspective of Secwepemc and is actively engaging with Secwepemc to better understand their concerns. BC Hydro will pursue negotiations with Secwepemc regarding proposed measures.
Pre-Application/EA Draft Multiple meetings Letter(s)	Right to Harvest Loss of plant harvesting areas and opportunities. Use of traditional resources.	• Data gaps (extent of noxious weed, distribution and abundance of rare plants in the LSA). • Water Resources (hydrological regime and	No specific study of TU within the LSA. Terrestrial lands have been lost to inundation due to the existing hydro reservoir	• Conduct a Secwepemc CHA. • Expedite implementation of current mitigation strategies.	Ongoing resolution at various tables between BC Hydro and Secwepemc, and with other parties as required.

Aboriginal Group: Secwepemc					
Consultation Stage / Information Source	Issue – Aboriginal Interest	Issue – Other Matters of Concern	Analysis of Potential Effect	Proposed Measures to Avoid, Mitigate or Otherwise Manage Effects	Status of Issue *(e.g. resolved, ongoing resolution, referred to agency, etc.)*
		increased flow velocities). • Community well-being (disconnection to the land in the LSA due to existing activities). • Heritage Resources	system, it is assumed that a number of plant harvesting areas and opportunities have likely already been affected or lost. Further alteration of the hydrological regime and increased flow velocities due to the project will promote further erosion of upland and riparian areas. Resulting in: Further loss of vegetation and impacts on Secwepemc access and opportunity for plant harvesting.	• Secure and purchase ecologically significant lands within the LSA for conservation, enhancement and stewardship activities. • Formalize soft operating constraints for the Middle Columbia River, Kinbasket Reservoir, and Arrow Lake. • Fund Secwepemc community member's education for environmental programs. • Fund and implement a Columbia Basin Cultural Heritage Management Board • Complete a compensation agreement that fully addressed the non-mitigable impacts to non-archaeological cultural heritage resources.	While BC Hydro has not identified potential Project effects on Aboriginal groups' right to harvest, it acknowledges the perspective of Secwepemc and is actively engaging with Secwepemc to better understand their concerns. BC Hydro will pursue negotiations with Secwepemc regarding proposed measures.
Pre-Application/EA Draft Multiple meetings Letter(s)	Right to Hunt and Trap Loss of hunting areas and opportunities. Loss of habitat Loss of access to previously desirable areas for resource harvesting and resource management.	• Data gaps (impacts on wildlife species include information for species at risk such as red-listed badger and grizzly bear). • Community well-being (disconnection to the land in the LSA due to existing activities).	Baseline information surrounding the wildlife valued component remains uncertain. Impacts are not captured in the current process which focuses on the incremental potential effects of the project based on our current understanding of the existing condition following the Revelstoke 5 project. The concepts of ecological and cultural	• Species specific management plans. • Conduct a Secwepemc CHA. • Expedite implementation of current mitigation strategies. • Secure and purchase ecologically significant lands within the LSA for conservation, enhancement and stewardship activities. • Formalize soft operating constraints for the Middle	Ongoing resolution at various tables between BC Hydro and Secwepemc, and with other parties as required. While BC Hydro has not identified potential Project effects to wildlife or species at risk, it acknowledges the perspective of Secwepemc and is actively engaging with Secwepemc to better understand

Aboriginal Group: Secwepemc					
Consultation Stage / Information Source	Issue – Aboriginal Interest	Issue – Other Matters of Concern	Analysis of Potential Effect	Proposed Measures to Avoid, Mitigate or Otherwise Manage Effects	Status of Issue *(e.g. resolved, ongoing resolution, referred to agency, etc.)*
			thresholds need to be considered. Resulting in: Uncertainty and information gaps represents a higher risk to wildlife and Secwepemc hunting opportunities.	Columbia River, Kinbasket Reservoir, and Arrow Lake. • Fund Secwepemc community member's education for environmental programs. • Fund and implement a Columbia Basin Cultural Heritage Management Board. • Complete a compensation agreement that fully addressed the non-mitigable impacts to non-archaeological cultural heritage resources.	their concerns. BC Hydro will pursue negotiations with Secwepemc regarding proposed measures.
Pre-Application/EA Draft Multiple meetings Letter(s)	Right to Harvest Traditional Plants Loss of medicine gathering sites and opportunities.	• Data gaps (field studies extent of noxious weed, distribution and abundance of rare plants in the LSA). • Community Well-being (disconnection to the land in the LSA due to existing activities).	Historical reservoir operations have impacted medicinal gathering areas but have not undergone project specific TU studies. Current gaps in project information concerning baseline of the vegetation communities that existed prior to the initial construction of the Project. Resulting in: Unacceptable risk to the remaining medicine gathering sites and will impact Secwepemc opportunities to continue harvesting medicinal plants and materials and to access these sites.	• Conduct a Secwepemc CHA. • Expedite implementation of current mitigation strategies. • Secure and purchase ecologically significant lands within the LSA for conservation, enhancement and stewardship activities. • Formalize soft operating constraints for the Middle Columbia River, Kinbasket Reservoir, and Arrow Lake. • Fund Secwepemc community member's education for environmental programs. • Fund and implement a Columbia Basin Cultural Heritage	Ongoing resolution at various tables between BC Hydro and Secwepemc, and with other parties as required. While BC Hydro has not identified potential Project effects on plant harvesting areas within Secwepemc's asserted territory, it acknowledges the perspective of Secwepemc and is actively engaging with Secwepemc to better understand their concerns. BC Hydro will pursue negotiations with Secwepemc regarding proposed measures.

Aboriginal Group: Secwepemc					
Consultation Stage / Information Source	Issue – Aboriginal Interest	Issue – Other Matters of Concern	Analysis of Potential Effect	Proposed Measures to Avoid, Mitigate or Otherwise Manage Effects	Status of Issue *(e.g. resolved, ongoing resolution, referred to agency, etc.)*
				Management Board. • Complete a compensation agreement that fully addressed the non-mitigable impacts to non-archaeological cultural heritage resources.	
Pre-Application/EA Draft Multiple meetings Letter(s)	Right to Use Spiritual /Traditional Sites Loss of spiritual/ceremonial sites and opportunities.	• Community well being (disconnection to the land in the LSA due to existing activities). • Noise	There is known spiritual and ceremonial use of the Upper Columbia River valley. Industry related noise and activity impacts the use of spiritual sites. Resulting in: Disturbance to spiritual and ceremonial use as well as impact to the viability of hunting and community camping sites.	• Conduct a Secwepemc CHA for the LSA. • Expedite implementation of current mitigation. • Secure and purchase ecologically significant lands within the LSA for conservation, enhancement and stewardship activities. • Formalize soft operating constraints for the Middle Columbia River, Kinbasket Reservoir, and Arrow Lake. • Fund Secwepemc community member's education for environmental programs. • Fund and implement a Columbia Basin Cultural Heritage Management Board. • Complete a compensation agreement that fully addressed the non-mitigable impacts to non-archaeological cultural heritage resources.	Ongoing resolution at various tables between BC Hydro and Secwepemc, and with other parties as required. While BC Hydro has not identified potential Project effects on Aboriginal groups' right to use spiritual / traditional sites, it acknowledges the perspective of Secwepemc and is actively engaging with Secwepemc to better understand their concerns. BC Hydro will pursue negotiations with Secwepemc regarding proposed measures.

Aboriginal Group: Secwepemc					
Consultation Stage / Information Source	Issue – Aboriginal Interest	Issue – Other Matters of Concern	Analysis of Potential Effect	Proposed Measures to Avoid, Mitigate or Otherwise Manage Effects	Status of Issue *(e.g. resolved, ongoing resolution, referred to agency, etc.)*
Pre-Application/EA Draft Multiple meetings Letter(s)	Right to Use Spiritual /Traditional Sites Loss of spiritual/ceremonial sites and opportunities.	• Heritage Resources (measurable disturbance to or loss of archaeological sites).	Ongoing erosion, and resultant increase in localized erosion from Revelstoke 6. Revelstoke 5 baseline ignores the effects of decades of past development and operation on the Columbia valley's archaeological resources. Resulting in: Continued loss of archaeological sites and resources in the LSA and the Columbia valley.	• Develop and implement a mitigation strategy to address impacts to known archaeological sites in Arrow, Revelstoke and Kinbasket Reservoirs. • Complete, a compensation agreement that fully addresses the non-mitigatable impacts to archaeological resources impacted by operations of the Revelstoke 6 facility in the Arrow, Revelstoke and Kinbasket Reservoirs. • Complete an inventory of 100% of modeled high archaeological potential in the LSA, and a representative sample of low archaeological potential. • Expand the archaeological potential model to other reservoirs in Secwepemc Territory. • Revisit archaeological sites where inventory is incomplete, and complete inventory. • Biannual monitoring of effects on LSA archaeological sites at low pool. • Expand archaeological studies to determine whether	Ongoing resolution at various tables between BC Hydro and Secwepemc, and with other parties as required. BC Hydro has identified potential Project effects to archaeological sites through increased erosion. BC Hydro has proposed mitigation measures in Part B, Section 7, and is actively engaging with Secwepemc and other affected Aboriginal Groups to develop culturally appropriate approaches and mitigation measures.

Aboriginal Group: Secwepemc					
Consultation Stage / Information Source	Issue – Aboriginal Interest	Issue – Other Matters of Concern	Analysis of Potential Effect	Proposed Measures to Avoid, Mitigate or Otherwise Manage Effects	Status of Issue *(e.g. resolved, ongoing resolution, referred to agency, etc.)*
				effects of Revelstoke 6 impacts the Nakusp Narrows. • Fund research regarding identification and investigation of intact sites above full pool. • Develop and implement a culturally appropriate adaptive archaeological management plan. • Involve and train community members to carry out monitoring. • Implement mitigation measures proposed in Part B Off Site compensation for losses to archaeological sites in the LSA. • Fund community members' education for archaeology/anthropology programs.	
Pre-Application/EA Draft Multiple meetings Letter(s)	Traditional Land and Resource Use Loss of cultural and spiritual enjoyment.	• Lessened ability for Secwepemc peoples to protect their holistic worldview and Secwepemc relationship to the land. • Community well being (disconnection to the land in the LSA due to existing activities).	Ongoing erosion and periodic inundation resulting from higher water levels and increased flows in the Columbia River and reservoirs. Specific TU study of the LSA has not been conducted and the quantification of the transport processes and storage sites within the reservoir system has not undergone a detailed assessment.	• Conduct a Secwepemc CHA • Expedite implementation of current mitigation strategies. • Formalize soft operating constraints for the Middle Columbia River, Kinbasket Reservoir, and Arrow. • Fund Secwepemc community member's education for environmental programs.	While BC Hydro has not identified potential Project effects to the rights of Aboriginal Groups to access their asserted territory or traditional use sites, it acknowledges the perspective of Secwepemc and is actively engaging with Secwepemc to better understand their concerns. BC Hydro will

Aboriginal Group: Secwepemc					
Consultation Stage / Information Source	Issue – Aboriginal Interest	Issue – Other Matters of Concern	Analysis of Potential Effect	Proposed Measures to Avoid, Mitigate or Otherwise Manage Effects	Status of Issue *(e.g. resolved, ongoing resolution, referred to agency, etc.)*
			Anticipated physical loss of land and resource management opportunities. Resulting in: Continued loss of access to Secwepemc lands and resources as many of the travel corridors are located along areas that are typically easiest to travel (e.g., valley bottoms). Lessened ability for Secwepemc peoples to protect the holistic worldview and Secwepemc relationship to the land.	• Fund and implement a Columbia Basin Cultural Heritage Management Board. • Complete a compensation agreement that fully addressed the non-mitigable impacts to non-archaeological cultural heritage resources impacted by operation of the Revelstoke 6 facility, including impacts to date.	pursue negotiations with Secwepemc regarding proposed measures.
Pre-Application/EA Draft Pre-Application/EA Draft Multiple meetings Letter(s)	Cumulative Impacts on Secwepemc Title and Rights.	• Family structures and the passing on of TEK to children is negatively impacted with the continual infringement on important areas (e.g. traditional hunting, fishing and gathering sites). • Community well being (disconnection to the land in the LSA due to existing activities).	Potential adverse effects of the proposed project on Secwepemc Title & Rights are anticipated due to a lack of baseline information as well as significant gaps in the understanding of the extent and implication of these effects. Resulting in: Eroded and fragmented Secwepemc territorial integrity and cultural continuity.	• Conduct a comprehensive cumulative effects assessment to better understand past, present, and future impacts on cultural and natural resources in the Upper Columbia River Basin. • Develop and adaptive cultural and natural resource management programs. • Conduct a Secwepemc CHA for the LSA to better understand the level of impacts on Secwepemc Title and Rights. • Expedite implementation of current mitigation	Ongoing resolution at various tables between BC Hydro and Secwepemc, and with other parties as required. BC Hydro has identified temporary and low magnitude cumulative effects for socio-community, and has proposed mitigation measures in Part B, Section 6. BC Hydro acknowledges the perspective of Secwepemc and is actively engaging with Secwepemc to better understand their concerns. BC Hydro will pursue negotiations with Secwepemc

Aboriginal Group: Secwepemc					
Consultation Stage / Information Source	Issue – Aboriginal Interest	Issue – Other Matters of Concern	Analysis of Potential Effect	Proposed Measures to Avoid, Mitigate or Otherwise Manage Effects	Status of Issue *(e.g. resolved, ongoing resolution, referred to agency, etc.)*
				strategies (e.g. fish entrainment, reservoir and stream fertilization, increased shoreline erosion control, etc.). • Secure and purchase ecologically significant lands within the LSA for conservation, enhancement and stewardship activities. • Formalize soft operating constraints for the Middle Columbia River, Kinbasket Reservoir, and Arrow Lake. • Fund Secwepemc community member's education for environmental programs to support Secwepemc involvement in the implementation of the above mitigation strategies. • Fund and implement a Columbia Basin Cultural Heritage Management Board to address mitigation activities upstream of Nakusp. • Complete, a compensation agreement that fully addressed the non-mitigable impacts to non-archaeological cultural heritage resources impacted by operation of the Revelstoke 6 facility.	regarding proposed measures.

11.5 Schedule C Aboriginal Group Contributions

11.5.1 Ktunaxa

The following section is the Ktunaxa Nation's description of their Aboriginal Interests as relate to the proposed Project, and their assessment of potential adverse effects of the proposed Project on their Aboriginal Interests. Preliminary recommendations for mitigation measures compiled through BC Hydro's consultation with the Ktunaxa Nation are included in the summaries provided in Sections 11.2 and 11.3. Final mitigation measures to be implemented for the Project will be determined and agreed to with BC EAO, affected First Nations, and BC Hydro.

This work is the product of the Ktunaxa Nation Council alone and is intended to provide the Aboriginal groups information in a manner consistent with its independent research, community and traditional knowledge, and world view. BC Hydro has not in any way altered the content of this section.

11.5.2 Okanagan

The following section is the Okanagan Nation's description of their Aboriginal Interests as relate to the proposed Project, and their assessment of potential adverse effects of the proposed Project on their Aboriginal Interests. Preliminary recommendations for mitigation measures compiled through BC Hydro's consultation with the Okanagan Nation are included in the summaries provided in Sections 11.2 and 11.3. Final mitigation measures to be implemented for the Project will be determined and agreed to with BC EAO, affected First Nations, and BC Hydro.

This work is the product of the Okanagan Nation alone and is intended to provide the Aboriginal groups information in a manner consistent with its independent research, community and traditional knowledge, and world view. BC Hydro has not in any way altered the content of this section.

11.5.3 Secwepemc

The following section is the Secwepemc Band's description of their Aboriginal Interests as relate to the proposed Project, and their assessment of potential adverse effects of the proposed Project on their Aboriginal Interests. Preliminary recommendations for mitigation measures compiled through BC Hydro's consultation with the Secwepemc Bands are included in the summaries provided in Sections 11.2 and 11.3. Final mitigation measures to be implemented for the Project will be determined and agreed to with BC EAO, affected First Nations, and BC Hydro.

This work is the product of the Secwepemc Bands alone and is intended to provide the Aboriginal groups information in a manner consistent with its independent research, community and traditional knowledge, and world view. BC Hydro has not in any way altered the content of this section.

SECTION C

Ktunaxa Nation Title, Rights and Interests

Prepared by the Firelight Group Research Cooperative
with the Ktunaxa Nation Council
and BC Hydro



February 2017

REVELSTOKE GENERATING STATION UNIT 6 PROJECT ENVIRONMENTAL ASSESSMENT CERTIFICATE APPLICATION

SECTION C: KTUNAXA NATION TITLE, RIGHTS AND INTERESTS

Prepared by the Firelight Group Research Cooperative with KNC and BC Hydro

While Firelight and the KNC have worked to accurately reflect Ktunaxa knowledge and convey Ktunaxa title, rights, and interests in relation to the proposed Project, including cultural and land use information. Information contained in this chapter is a partial and limited depiction of the dynamic and living system of use and knowledge maintained by Ktunaxa governments, elders and citizens. This chapter does not provide a full or complete description of all information related to Ktunaxa title, rights and interests; that information will continue to evolve over time. Nor does this chapter provide a complete description of the Project's potential effects on the environment and Ktunaxa title, use, rights, culture and interests. Information regarding those effects will continue to develop as the Project is assessed and, if approved, developed, operated, and monitored.

The KNC's participation in preparing this chapter is without prejudice to, and shall not be construed as defining, waiving, or limiting the Aboriginal rights and interests of the Ktunaxa Nation or other Indigenous communities. In particular, the KNC's participation in preparing this chapter does not waive or diminish the obligation of any government agency to fully and meaningfully consult with the KNC regarding the proposed Project, including its construction and operation, and any anticipated or unanticipated impacts it may have. Information contained here is provided for the purposes of the Revelstoke Generating Station Unit 6 Project environmental assessment and is specific to Ktunaxa Nation Council considerations regarding the Project. It should not be relied upon to inform any other processes, assessments, or decisions except with written consent from the Ktunaxa Nation Council (KNC).

Thanks and acknowledgements go to the Ktunaxa Elders, knowledge holders, staff, and leadership who contributed to this project. This report could not have been completed without their support and expert knowledge. Thanks also to Vi Birdstone for peer review, to the Canadian Columbia Inter-tribal Fisheries Commission and Marlene Machmer of Pandion Ecological Research for review and drafting support.



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Glossary of Ktunaxa Terms

Ktunaxa	Translation/meaning
haɬinkikqa	Transport across water
k̓upawiɬq̓nuk	Place name, head of the lake, refers to the Ksanka Band.
k̓isqatuk	Cold water
Ktunwakanmituk Miɬq̓aqas	Place name for Revelstoke
k̓utmik	Hot water/hot springs
Miɬq̓aqas ʔa·kinmituk	Place name for the Columbia River
Miɬq̓aqas ʔamakʔis	Ktunaxa land district encompassing the Upper and Mid Columbia River and Arrow Lakes, also called Land of the Chickadee/Chickadee's Land
napituk	Water
Naɬmuqɬin	A giant being and Chief animal from Ktunaxa Creation Story.
qanikitɬi	Ktunaxa values and principles
Qat'muk	Place name referring to an area in the central part of the Purcell mountains, it is the home of 'grizzly bear spirit' and thus, has to be carefully protected, see also Qat'muk Declaration in C12
qaɬsu	Place name for Kaslo
wu'u	Water for drinking
xapkɬinik	Name used to refer to Colville-speaking group from Kettle Falls area.
Xaʔɬɬɬĭn	Place name, now called Halcyon
yaqan nuʔkiy	Place name, "Where the Rock Stands", also refers to the Lower Kootenay near present day Creston.
Yaqaŧ hankatitiŧki na ʔamak	Translates to "our people care for the land, the land cares for our people." Ktunaxa stewardship principles, the Ktunaxa phrase that captures the interconnectedness and the stewardship concepts applicable to land management
Yawuki·kam (Yau-Ke'Kam)	A prominent character in Ktunaxa oral histories
Yawuʔnik̓	A prominent character, described as a powerful water creature, in Ktunaxa oral histories
ɬałnu ʔamakʔis Ƚałnuʔnik̓ (ɬaɬnunik)	Place name for Nakusp. Ƚałnuʔnik̓ refers to people living in the Nakusp and Arrow Lakes area.
ŧaqananmituk	Water flowing into something narrow (i.e., canal or cave)

Ktunaxa	Translation/meaning
¢aqayit (ɋukayit)	Caterpillar, name of a lower Ktunaxa chief who lived in the mid-1800's.
¢iɋqum wu'uis	Place name, "Waterdipper's Water, also refers to the Illecillewaet River near Revelstoke
¢umuk	Water to bubble up out of the ground
ʔa·qaɬq̓anuxwatiɬ	Ktunaxa legends or stories
ʔaɋ̓pu	Wolverine (*Gulogulo*)
ʔa·kikq̓anak	Still water
ʔakink̓um̓asnuqɬiʔit	A prairie on Tobacco Plains Reserve
ʔakisq'nuk (ʔakisq̓nuk)	The land between Windermere Lake and Waterton Lake
ʔaknumuɋtitit	Ktunaxa Nation laws on how to live with the land
ʔakuk'pukam (ʔakuk̓pukam)	Speaks to anything that gets life from the earth through roots
ʔakuk'pukamnam	Builds on ʔakuk̓pukam and adds the human dimension, whereby the earth's life is translated into human life
ʔamak	Country, earth, ground
ʔaq'am (ʔaq̓am)	St. Mary's reserve near Cranbrook, BC
ʔaq'anqmi (ʔaq̓anqmi)	Place name referring to where the kootenai tribe of Idaho live
-ʔa·kxam̓is q̓api qapsin	Ktunaxa principle meaning a responsibility for stewardship of all living things
ʔisnuxuʔnuk	Swiftly flowing water

KTUNAXA NATION INFORMATION

Building on Part A and Part B, this chapter introduces Ktunaxa Nation title[1], rights and interests in relation to the Revelstoke Generating Station Unit 6 Project (the Project) and identifies linkages between Ktunaxa title, rights and interests and other discipline-specific studies (e.g., ecosystems, vegetation, wildlife, water quality and quantity, aquatic health, archaeology, and fish), including adverse Project and cumulative effects. This section also identifies practical means to avoid, mitigate or otherwise accommodate such potential adverse effects.

Schedule C of the May 22, 2015 Order under Section 11 of the British Columbia (BC) *Environmental Assessment Act* for the Project lists the following First Nations as relevant to the Project: "ʔakisq'nuk First Nation, Ktunaxa Nation Council, Lower Kootenay Band, St. Mary's Band, and the Tobacco Plains Band"[2]. Each is part of the Ktunaxa Nation and all are represented collectively by the Ktunaxa Nation Council as described in Section C1. The Ktunaxa Nation Council maintains unceded Aboriginal title and rights in portions of the Project area and alongside its neighbours. It reserves the right to make its own decisions regarding the Project and the disposition and stewardship of its lands, waters, and surface and sub-surface resources, including those where the Project is proposed.

BC Hydro and the Ktunaxa Nation Council (KNC) have worked collaboratively to complete Section C and to conduct an assessment of Ktunaxa title, rights and interests in relation to the anticipated effects of the Project. **Based on the available baseline information, the KNC has arrived at a different understanding of the consequence of residual Project effects than is expressed by BC Hydro and its consultants in Part B. KNC has relied upon the baseline materials provided in Part B as the best available information, but considers BC Hydro's Part B assessment findings to be inadequate and contrary to, or unsupported by, foundational elements of that baseline related to changes in erosion, velocity, water depth, timing and frequency of flows, and consequence for associated valued components. KNC also disagrees with some aspects of BC Hydro's assessment methodology, particularly as related to identifying valued components and assessing residual and cumulative effects.**

The collaborative approach taken by KNC and BC Hydro in preparing this chapter does not imply or suggest Ktunaxa Nation consent or support for the Project, or agreement with findings in other sections of the application. Collaboration on Section C has occurred within the context of documented disagreement between the KNC and BC Hydro. This chapter is without prejudice to the Ktunaxa Nation's Aboriginal rights, or to a final Ktunaxa Nation determination regarding the acceptability of the proposed Project. The Ktunaxa Nation, as represented by the KNC, intends to participate fully,

[1] Within Canadian law, Aboriginal title is a specific form of Aboriginal right. Throughout this section, and unless otherwise indicated, rights includes Aboriginal and Ktunaxa title.
[2] The Order under Section 11 identifies the scope of the environmental assessment and related consultation to be undertaken by the Proponent in relation to the proposed Project. Section 3.1.2 of the Order Under Section 11 indicates that the assessment "will include consideration of potential adverse effects on Aboriginal interests of Aboriginal groups and, to the extent appropriate, practical means to avoid, mitigate or otherwise accommodate such potential adverse effects" (BC EAO 2015).

meaningfully, and powerfully in the application review period and related permitting and decision-making processes.

With support from BC Hydro, KNC retained Firelight Group Research Ltd. (Firelight) to undertake baseline data collection, assessment, and technical writing. This document was written by Firelight in collaboration with KNC staff and technical advisors, with reference to BC Hydro baseline studies found in Section B of this application, and is based on Ktunaxa knowledge and primary and secondary documents as cited. KNC recognizes that these sources are limited, and reliance on them does not imply that they are considered to be complete or adequate. Ktunaxa Nation Council Lands and Resources (KLR) geographic information systems (GIS) and Firelight prepared all maps in Section C. Section C10, Aboriginal Consultation, relies upon, and makes reference to, BC Hydro *Draft Aboriginal Consultation Report 2 Revelstoke Unit 6 Project* (January 27, 2017) and Section A 2.3. The Consultation reports drafted by BC Hydro should not be read as reflecting the views, findings or conclusions of the KNC.

KNC understands that in some cases, additional work is ongoing and that assessment conclusions may be modified as a result of the review process. If additional or supplemental information becomes available or if assessment conclusions are modified during the application review period, KNC reserves the right to reconsider its assessment of anticipated Project and cumulative effects on Ktunaxa rights and interests. KNC also underlines that information regarding Project effects will continue to develop during Project implementation and operation. KNC reserves its right to revisit any conclusions or opinions expressed in this section, based on new information, and to participate in further consultation and assessment as appropriate.

BC Hydro and KNC are continuing to talk about the implications of the Project. An *Impact Management and Benefit Agreement* (IMBA), or similar agreement, may be negotiated during the application review period and, if agreement is reached, may include commitments by BC Hydro and KNC designed to address some Ktunaxa rights and interests at a local or regional level.

Section C is divided into ten primary sub-sections as follows:

- **C1 Ktunaxa Nation Background Information, Project Understanding, and Methods** includes general information on the Ktunaxa Nation: traditional lands (ʔamakʔis) and ecology, ethno-historic and linguistic background, governance, land use and stewardship principles, and the location of Ktunaxa communities. It also includes the Ktunaxa understanding of the Project, and lists the methods used for Ktunaxa baseline collection and the assessment of Project effects on Ktunaxa rights and interests.
- **C2-C8 Ktunaxa Nation Rights** includes two cross-cutting chapters, water (C2) and cumulative effects (C8) and five chapters organized according to the five pillars or Sectors of Ktunaxa Nation governance: Traditional Knowledge and Language Sector (C3), Economic Investment Sector (C4), Education and Employment Sector (C5), Social Sector (C6), and Lands and Resources Sector (C7). These sections include a non-confidential summary of past, present and anticipated future Ktunaxa use of the Middle Columbia River (MCR) and local study area (LSA) (see Section C3); the identification of specific Ktunaxa rights related to potential social, economic, environmental, heritage and health effects, including Ktunaxa title, in the Project area; the identification of potential Project effects on Ktunaxa use and rights; and a description of mitigation and other measures recommended by the KNC.

- **C9 Other Ktunaxa Nation Interests** identifies other Ktunaxa interests with respect to potential social, economic, environmental, heritage, and health effects not already identified in Sections C2-C8. Due to KNC's broad view of Ktunaxa rights in the Upper and Mid Columbia River and Arrow Lakes area, the majority of these issues are dealt with under Sections C2-C8 (Ktunaxa Nation Rights).
- **C10 Aboriginal Consultation** refers to Part A, Section A 2.3 as drafted by BC Hydro. C10 also summarizes the key issues relevant to the environmental assessment raised by KNC during First Nations consultation.
- **C11 Summary** includes a table summarizing the potential effects or opportunities created by the Project in relation to Ktunaxa rights and interests, and includes suggestions on how these may be addressed through design considerations, mitigations, accommodations, and specific commitments or measures.

C1 KTUNAXA NATION BACKGROUND

The Ktunaxa Nation is made up of all Ktunaxa citizens residing both within and outside of Ktunaxa ʔamakʔis[3], including the member communities and their citizens. Additional information on the background and governance of the Ktunaxa Nation is included in Sections C1.6 and C1.7 below.

Section C1.2 below discusses how the northern portion of Ktunaxa ʔamakʔis has historically been claimed by Canada, while the southern half is claimed by the United States. In Canada, the member communities of the Ktunaxa Nation include ʔakink'umɬasnuqɬiʔit (Tobacco Plains Band), ʔaq̓am (St. Mary's Band), yaqan nuʔkiy (Lower Kootenay Band), and ʔakisq'nuk (Columbia Lake Band). While Canada's claims to Ktunaxa ʔamakʔis are unresolved, the Ktunaxa Nation maintains unceded Aboriginal and Ktunaxa title[4] in much of what is now considered the East and West Kootenays. The British Columbia portion of Ktunaxa ʔamakʔis is subject to ongoing treaty negotiations with the Province of BC and the Government of Canada. Ktunaxa communities south of the Canada-USA border are located in what is now Idaho and Montana and are subject to the laws of the United States.

C1.1 Potentially Affected Ktunaxa Nation Communities

The Project is located in the Mid Columbia River Valley, portions of which are within the unceded and unsurrendered territory of the Ktunaxa Nation. The Columbia River Valley is located in the Columbia Mountains (Purcells, Selkirks, Cariboos, Monashees) in Ktunaxa ʔamakʔis (see Section C1.2 below). Ktunaxa communities maintain deep cultural connection to the Columbia Valley, including the Arrow Lakes and areas north and south, including the Project Area. Based on Ktunaxa knowledge, portions of the LSA have been occupied continuously by the Ktunaxa Nation since time immemorial. The Ktunaxa Nation maintains Aboriginal title alongside its neighbours to large portions of the Mid Columbia River (MCR)[5] and the Arrow Lakes.

The potentially affected Ktunaxa First Nations identified in Schedule C of BC's Order under Section 11 for the Project are:

- ʔakisq'nuk First Nation (Columbia Lake Band) near Windermere, BC;
- Ktunaxa Nation Council;
- yaqan nuʔkiy (Lower Kootenay Band) near Creston, BC;
- ʔaq'am (ʔaqam Band, formerly known as St. Mary's Band) near Cranbrook, BC; and
- ʔakink'umɬasnuqɬiʔit (Tobacco Plains Band) near Grasmere, BC;

The Ktunaxa Nation Council (KNC) represents the interests of the Ktunaxa Nation and of all four of the potentially affected Ktunaxa communities and citizens in Canada.

[3] The term "Ktunaxa ʔamakʔis" means land, earth, or home belonging to Ktunaxa people. It is used throughout Section C to refer to the spatial area or territory recognized by Ktunaxa citizens as Ktunaxa lands under Ktunaxa law, and where the KNC considers the Nation's rights and title apply. See Figure C1-2 for a depiction of Ktunaxa ʔamakʔis within BC.
[4] Where Aboriginal title and rights exist within and are defined by Canadian law, Ktunaxa title and rights exist within and are defined by Ktunaxa law.
[5] The acronym MCR is used throughout section C to refer to the Mid Columbia River or Mid Columbia Reach.

C1.1.1 Ktunaxa Lands and Communities

The Ktunaxa Nation maintains underlying sovereign and *sui generis* title to all lands and waters within its territories, including portions of the Columbia River and Arrow Lakes, and the Project area. For illustrative purposes, Figure C1-1 shows the proposed Project in relation to Ktunaxa ʔamakʔis and the nearest current Ktunaxa communities and associated Indian Reserves[6]. The Canadian government has set aside only a small number of federal Indian Reserves for Ktunaxa Nation communities, including reserves at:

- ʔakisq'nuk (Columbia Lake near Windermere): two reserves (Columbia Lake 3 and St. Mary's 1A);
- yaqan nuʔkiy (Lower Kootenay Band near Creston): nine reserves (Creston 1; Lower Kootenay 1A; Lower Kootenay 1B; Lower Kootenay 1C; Lower Kootenay 2; Lower Kootenay 3; Lower Kootenay 4; Lower Kootenay 5; St. Mary's 1A);
- ʔaq'am (ʔaqam Band, formerly St. Mary's Band near Cranbrook) – five reserves (Bummers Flat 6; Cassimayooks (Mayook) 5; Isidore's Ranch 4; Kootenay 1; St. Mary's 1A); and
- ʔakink'umɬasnuqɬiʔit (Tobacco Plains near Grasmere) – two reserves (Tobacco Plains 2, St. Mary's 1A).

The nearest Ktunaxa Nation communities to the Project, as the crow flies, are ʔakisq'nuk (~180 kms), ʔaq'am (~230 kms) and yaqan nuʔkiy (~245 kms), but Ktunaxa citizens live and practice their rights throughout Ktunaxa ʔamakʔis, including in Revelstoke and surrounding areas. The Arrow Lakes and Mid Columbia River is especially closely tied to Ktunaxa families who today identify as Lower Kootenay, many of whom live in or near Ktunaxa reserve communities north of the border at yaqan nuʔkiy near Creston, B.C., or south of the border in Bonner's Ferry, Idaho.

C1.1.1.1 The Oatscott Reserve and Ktunaxa Communities on the Mid Columbia River

As discussed further in section C3, while currently neither BC nor Canada recognize Ktunaxa reserve lands in the Upper and Mid Columbia River and Arrow Lakes areas, a reserve that included a core of long-resident Ktunaxa families was established on the Arrow Lakes less than 100km south of Revelstoke at Oatscott near Burton and Caribou City in 1902. Due to what appears to have been administrative error, a number of Ktunaxa descendants, including the wife and children of Frank Joseph / Kootenay [7] (kukɬaknana), were not added to the membership list at Oatscott. Archival and census records indicate that Frank Joseph / Kootenay and his brother Louie, both Ktunaxa, were the last chiefs of the Oatscott Band, and that their father, Kootenay Joe (also Ktunaxa), was chief there before them prior to the reserve's establishment. Despite ongoing Ktunaxa presence in the Arrow Lakes and Mid Columbia River following Frank's death in 1932, including by Franks' Ktunaxa wife (Marian or Mary-Anne Goodman) and her three daughters, the reserve was de-listed and reverted back to Crown land in 1953.

In 1953, while Ktunaxa families continued to actively use and returned regularly to the Arrow Lakes and Revelstoke areas, the federal government considered Annie Joseph, the estranged wife of Frank's older brother, Louie Joseph / Kootenay, to be the last living member of the Arrow Lakes Band despite records

[6] Indian Reserves are federal land designations made by Canada in the late 19th and early 20th centuries and do not recognize ongoing Ktunaxa title. Ktunaxa rights and interests are not limited to reserve lands.
[7] Frank and his brother Louie are referred to frequently in archival records using 'Kootenay' as an alternate last name. We refer to them as Frank and Louie Joseph / Kootenay to reflect this.

indicating that Annie was likely Okanagan by birth and moved away from the Arrow Lakes back to the Okanagan sometime before 1921 and after the killing of her brother by Frank Joseph / Kootenay in 1909. From a Ktunaxa perspective, Marian Goodman and her descendants, as well as other Ktunaxa families connected to the area (especially the Capilo family), inherited cultural and stewardship responsibilities for the Arrow Lakes area, including the Oatscott reserve, following the death of Frank Joseph / Kootenay.

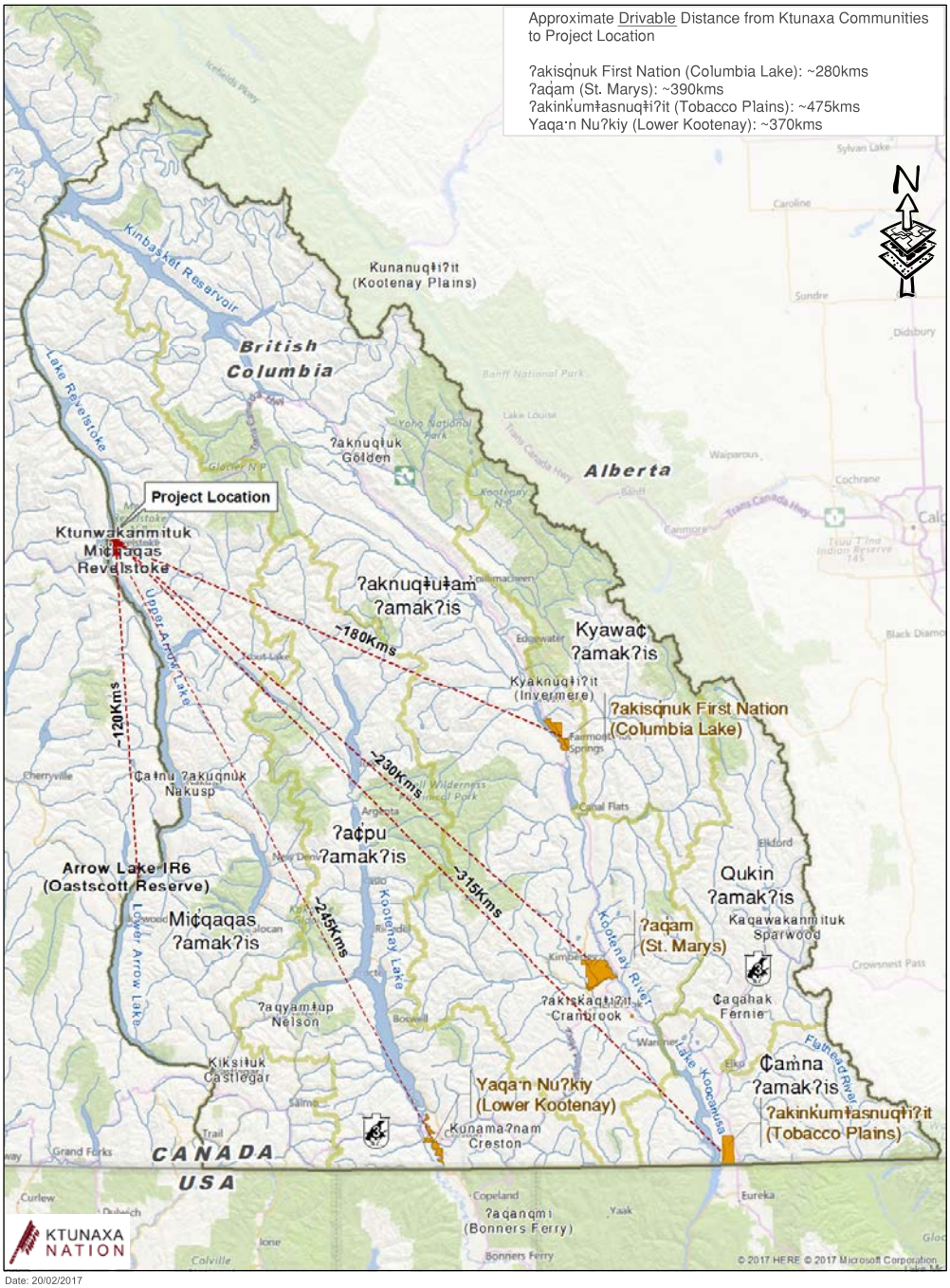
In terms of political affiliation, available evidence suggests that the Arrow Lakes reserve was considered a Ktunaxa community, at least administratively, by the federal government. Federal census documents indicate that the Arrow Lakes reserve was administered through the Kootenay Agency as Arrow Lakes 6, a continuation of numbering from Lower Kootenay 5. More importantly, other Ktunaxa leaders recognized the Arrow Lakes band as Ktunaxa. Election documents from 1932, witnessed by federal representatives, indicate that Chiefs Paul David of Tobacco Plains, Louis Abel of Columbia Lakes, Charles Isadore of Bonner's Ferry, and others from other Ktunaxa communities, included Frank Joseph / Kootenay as a chief representing the Arrow Lakes in a gathering of Ktunaxa chiefs held to select a new leader at Creston (Creston Review, June 3, 1932). Other information collected by Turney-High (1941), and maintained through Ktunaxa oral tradition, supports an understanding that the Ktunaxa community on the Arrow Lakes, including the Arrow Lake band, was part of the larger Ktunaxa Nation prior to, and following, 1846.

Available evidence indicates that Ktunaxa families living on the Arrow Lakes had often close relationships, including marriages, that included neighbouring groups, but were politically and culturally distinct from Lakes Colville (sometimes also called Sinixt), or other peoples who also travelled through and sometimes lived in the area. Based on archival sources and Ktunaxa oral history, while the community at Oatscott was culturally complex and almost certainly multilingual, it had a core of long standing Ktunaxa families who resided in the area of Oatscott, Burton, Nakusp and Caribou City, and who's seasonal round extending north along the Columbia River to at least Revelstoke, and south to at least the American border. Ktunaxa families on the Mid Columbia included the families of Frank and Louie Joseph (or 'Kootenay') as well as the Capilo, Caribou, and Goodman families, as well as others. These families had especially close connections to upper Ktunaxa communities in the area of ʔakisq'nuk and Columbia Lakes, ʔaq'am (St. Mary's), and lower Ktunaxa communities at yaqan nuʔkiy. A small number of other First Nation families living in the Arrow Lakes and along the MCR in the early 20th century were more likely affiliated with the Okanagan, Secwepmc (Shuswap), or Colville (Kettle Falls or Sinixt) [8].

Important Ktunaxa seasonal and permanent settlements were maintained in the area, including areas near Revelstoke and along the Upper and Mid Columbia River, well into the 1940s. Ktunaxa citizens continue to live in the Revelstoke area. Ktunaxa families, including the Capilo and Joseph/Goodman families, resided seasonally in the Burton area until at least the 1940s, and despite impacts, Ktunaxa cultural and rights practice on the Arrow Lakes and Mid Columbia region, including subsistence, habitation, transportation and cultural use, have been maintained by multiple Ktunaxa families, including the grandchildren and descendants of Frank Joseph / Kootenay and others residing at yaqan nuʔkiy, ʔaq'am, ʔakisq'nuk and elsewhere. Ktunaxa citizens continue to reside and practice their rights as best they can, including at Revelstoke, despite widespread impacts from hydroelectric operation, forestry, privatization of lands, urbanization and other activities (see Section C3).

[8] The 1914 statement of Alexander Christie to the Royal Commission on Indian Affairs makes clear that he considered his family to be Sinixt or Lakes, and that they were separate from the families at Oatscott and had separate leadership.

Figure C1-1 Ktunaxa Nation Communities in BC and Proximity (kms) to the Project



Date: 20/02/2017

Ktunaxa Nation Communities Proximity (Kms) to Project Location

Ktunaxa ?amak?is within BC
Ktunaxa Traditional Districts
Ktunaxa Reserves

0 25 50 100
Kilometers

Mapping: JGaldamez, Ktunaxa Lands & Resources :: UTM Zone 11 - NAD83 :: Data Source: KNC, BC Baseline

C1.2 Ktunaxa ʔamakʔis and Ecology

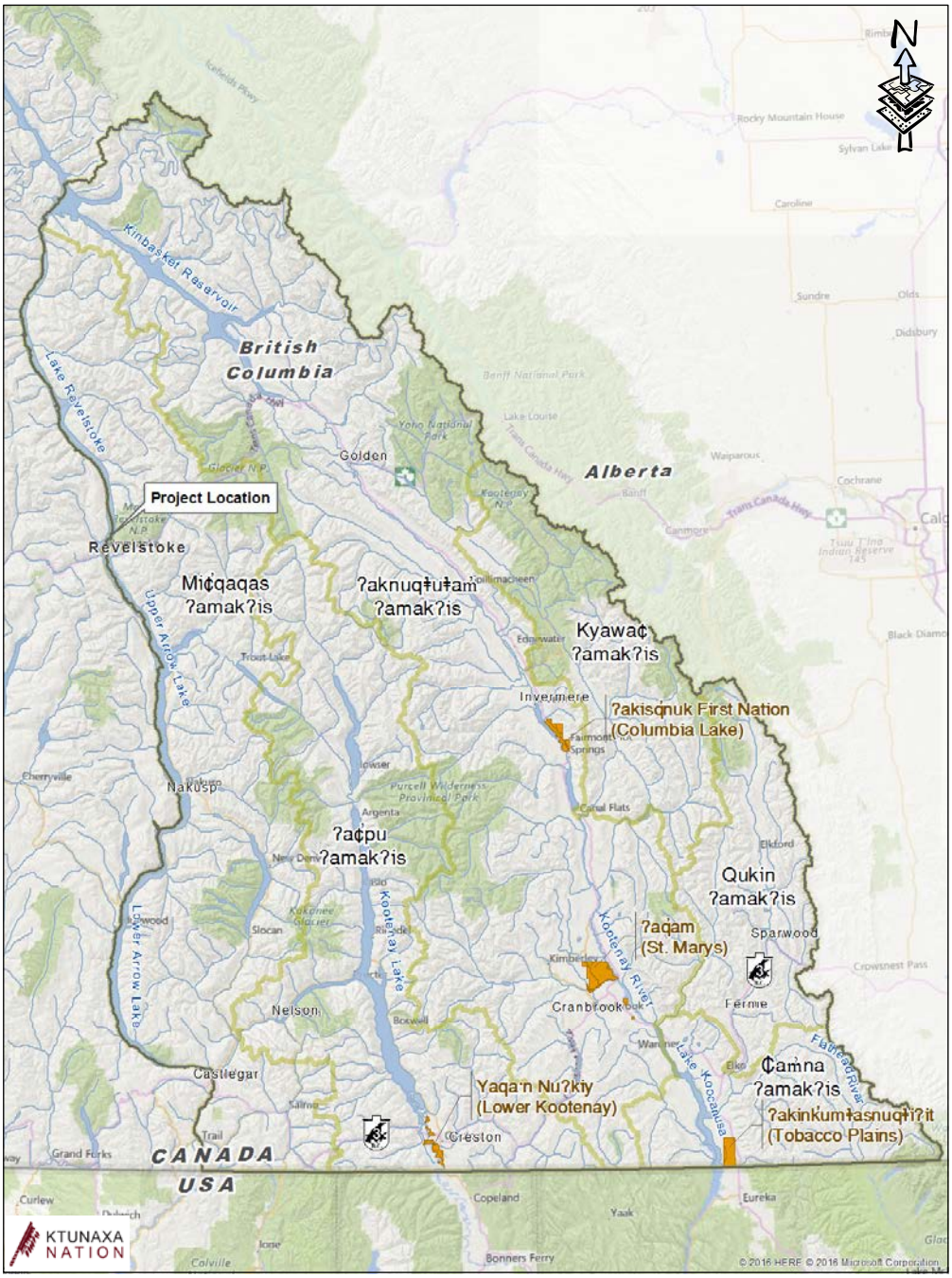
Ktunaxa ʔamakʔis extends well east of the Rocky Mountains and south into present day Montana, Idaho, and Washington states. Two Ktunaxa communities in the United States are affiliated with the KNC through a protocol agreement, however they have their own governance structure distinct from Ktunaxa in southeast British Columbia; these communities are ʔaq̓anqmi (Kootenai Tribe of Idaho near Bonners Ferry, Idaho) and k̓upawiɬq̓nuk (Ksanka Band, Confederated Salish and Kootenay Tribes of the Flathead Indian Reservation, near Elmo, Montana).

Ktunaxa sovereignty predates the 1846 establishment of the international boundary between Canada (then British North America) and the United States, and Ktunaxa rights extend across both provincial (Alberta/BC) and international borders. The core of Ktunaxa ʔamakʔis, within which Ktunaxa peoples, Ktunaxa culture, and Ktunaxa governance have persisted since time immemorial, is dominated by the valleys of the Upper Columbia and Kootenay River systems, and by the slopes and peaks of the Columbia Mountains and adjacent ranges to the east including the Rocky Mountains (Ktunaxa Nation Council Society, 2005). Within the borders claimed by Canada and British Columbia, Ktunaxa ʔamakʔis covers approximately 70,000 km^2 (27,000 square miles) of mountains, valleys, rivers and lakes in the Kootenay region. The region's landscape is alive with Ktunaxa culture and history.

Within Ktunaxa law and oral tradition, Ktunaxa ʔamakʔis is composed of traditional land districts. These are historically associated not only with key actors in the Ktunaxa creation story, but also with specific key resources and with particular Ktunaxa individuals or lineages that held particular authority and responsibility for resource stewardship in those areas. Traditional land districts play an important historic and contemporary role in Ktunaxa land governance and resource management. The Arrow Lakes and Mid Columbia River fall within the Ktunaxa traditional land district of Miɬqaqas ʔamakʔis, or land of the Chickadee[9]. Today, this area is known to Ktunaxa peoples not only for the richness of its fish and game but also for the presence of hydroelectric dams, and associated obstruction of salmon migration along the Columbia River, and the flooding and erosion of the valley bottoms which has inundated important cultural and harvesting locations, and impaired the ability of Ktunaxa citizens to maintain and pass on knowledge related to Miɬqaqas ʔamakʔis. Figure C1-2 shows the Project within the boundaries of Miɬqaqas ʔamakʔis , as currently understood and administered by the KLR Sector of KNC.

[9] Miɬqaqas ʔamakʔis is translated as Land of the Chickadee, or Chickadee's Land. It is also sometimes used as a synonym for the Arrow Lakes and Upper and Mid Columbia River Valley, because the valley and its surrounding mountains make up the majority of the lands associated with Chickadee.

Figure C1-2 Ktunaxa Nation Area of Intent and Traditional Districts



Date: 16/12/2016

Ktunaxa Districts within British Columbia Ktunaxa ?amak?is

Ktunaxa ?amak?is within BC
Ktunaxa Traditional Districts
Ktunaxa Reserves

0 25 50 100
Kilometers

Mapping: JGaldamez, Ktunaxa Lands & Resources :: UTM Zone 11 - NAD83 :: Data Source: KNC, BC Baseline

The diverse land forms, waters, animals, and plants that share Ktunaxa ʔamakʔis are under pressure from many sources of development and change. Valley bottoms, traditionally maintained through fire cycles as open forests and grasslands, are now threatened in many places by changes on the landscape from mining, fire suppression, housing, energy transmission, hydro-electric reservoirs, agriculture, and transportation systems. Higher altitude valleys and slopes provide critical habitat for culturally important species such as elk, deer, sheep, and grizzly bear. These ecosystems are impacted in many areas by forestry, mining, recreational development, and associated road networks.

The region's rivers and streams provide culturally important sources of fish and plants, many of which are now rare, endangered, or hard to find, including sturgeon, salmon, kokanee and various trout species. Both the Columbia and Kootenay River systems have been heavily modified by hydroelectric and other developments, including mining and forestry. Industrial development and other environmental changes have resulted in the complete disappearance from Ktunaxa ʔamakʔis of two cultural keystone species[10]: bison and anadromous salmon. Other cultural keystone species, including grizzly bear, caribou and sturgeon, and furbearers such as river otter, beaver, and mink, are in decline or at risk[11].

C1.3 Ktunaxa Understanding of the Project

This section summarizes and restates the technical understanding of the Project provided by BC Hydro within the broader context of Ktunaxa experience, culture, and history in the Arrow Lakes Reservoir and Upper and Mid Columbia River. A detailed technical description of the proposed Project, based on documentation provided by BC Hydro, and including activities associated with construction and operation can be found in Section A3.

KNC understands the Project to involve the addition of a 6th hydroelectric power generating unit to the existing generating station at the Revelstoke Dam that currently blocks Miɬʔqaqas ʔa·kinmituk (Columbia River), five kilometres upstream from the City of Revelstoke. Based on the project description for Revelstoke Generating Station Unit 6 that was provided by BC Hydro to the Environmental Assessment Office (BC Hydro 2016), KNC understands the Project to include:

- the addition of a 500 MW turbine and related equipment at the Revelstoke Generating Station, and associated construction works;
- a new water license increasing the dam's water allocation to 93,000 cubic feet per second (cfs) from its current 90,000 cfs volume;
- upgrades to off-site project components, including a capacitor station 200 kilometres downstream from Revelstoke Dam to increase the capacity of BC Hydro's transmission system.

The proposed increases in water allocation and flow capacity of the Revelstoke Dam associated with the Project would further impact a river system that has already been severely impacted by the existing dam

[10] Cultural keystone species are those that have a fundamental role in diet, as materials, or in medicine. These species often also feature strongly in cultural practices and narratives. For more on this see Garibaldi, A. and N. Turner. 2004. Cultural keystone species: implications for ecological conservation and restoration. Ecology and Society 9(3): 1. [online] URL: http://www.ecologyandsociety.org/vol9/iss3/art1/

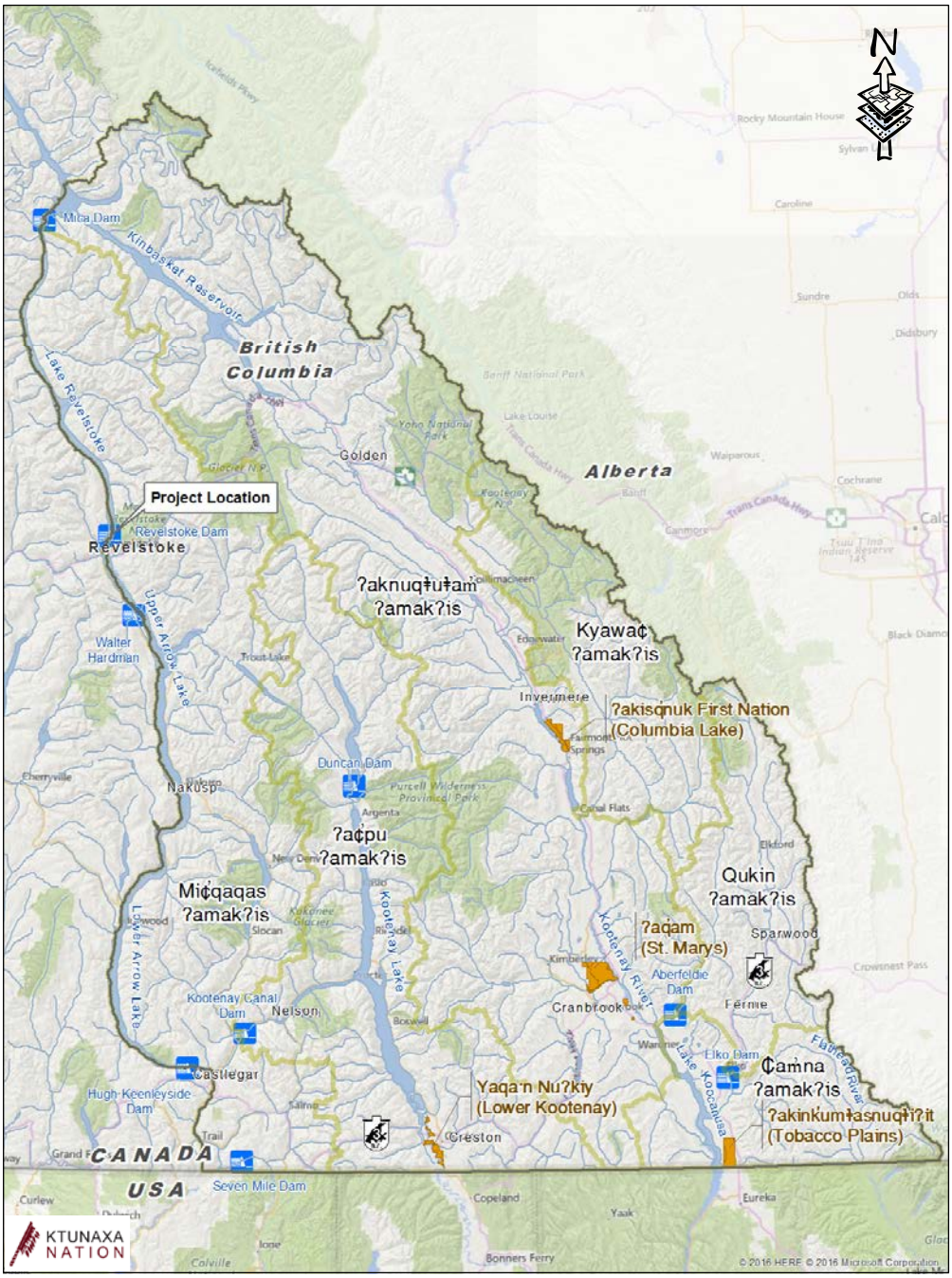
[11] BC Ministry of Environment cites "cumulative effects of human development" as the greatest threat to grizzly bears in BC today (BC MOE, 2012)

and operation of the first five generators. The sixth and final water turbine, which is expected to operate for between 70 and 100 years without any plans for decommission (BC Hydro 2016), would allow the dam to run at a higher capacity. BC Hydro has identified Project impacts that include: changes in reservoir levels, discharge rate, and river levels in the Columbia River between the Dam and Shelter Bay. The Ktunaxa Nation Council has serious concerns regarding these changes and increasing impacts associated with operation of the sixth turbine without adequately addressing the impact of existing BC Hydro development. By altering water levels, shoreline configurations, and river flow speed and sedimentation in the Upper and Mid Columbia River, the Ktunaxa anticipate increased shoreline erosion, impacts to now rare downstream flood plain, wetland and riparian habitats, and to the viability of downstream areas for fish. These impacts will further change the physical characteristics of the river and the adjoining habitat, altering the ecology of plants and animals in Ktunaxa ʔamakʔis.

From a historical perspective, impacts to water levels on the Columbia River, and resulting impacts on access, wildlife, and other values, have been experienced by Ktunaxa communities since the initial construction of the four-turbine Revelstoke Dam in 1984, and earlier construction of other dams upstream and downstream. Impacts intensified with a fifth turbine put into operation in 2010. For Ktunaxa citizens, impacts associated with the Revelstoke Dam are experienced within the context of other hydroelectric impoundment dams in Ktunaxa ʔamakʔis and on the Columbia River system, including the Mica Dam[12] upstream, and the Keenleyside Dam downstream, as well as others shown in Figure C1-3. For the Ktunaxa, the history of BC Hydro's dam operations in the area has been largely a story of exclusion. There has been little evidence of meaningful Ktunaxa involvement in, or benefit from the existing Revelstoke Dam, or from the history of generating stations and dams in Ktunaxa ʔamakʔis. While non-indigenous corporations, communities, municipalities and provincial governments have been enriched or improved through tax sharing, royalties, employment benefits, and by existing operations and the use of resources and assets from Ktunaxa ʔamakʔis, the Ktunaxa Nation and its citizens have suffered the heaviest impacts as a result of loss of use, disruption of rights, and disturbances of cultural areas. The dam's operation excludes the Ktunaxa Nation and its citizens from both use and stewardship of the Columbia River and from the economic benefits afforded by the dam, which flow to the Crown and others, but only rarely and indirectly to the Ktunaxa Nation.

[12] The Mica Dam was completed on the Columbia River in 1973 as one of four dams constructed under the terms of the 1964 Columbia River Treaty. All four (Mica Dam, Duncan Dam, Keenleyside Dam and Libby Dam) are situated in Ktunaxa ʔamakʔis.

Figure C1-3 Existing and Hydro-electric Dams within Ktunaxa ʔamakʔis



Date: 16/12/2016

BC Hydro Dams with Ktunaxa ʔamakʔis

Ktunaxa ʔamakʔis within BC
Ktunaxa Reserves
Ktunaxa Traditional Districts
BC Hydro Dam

0 25 50 100
Kilometers

Mapping: JGaldamez, Ktunaxa Lands & Resources :: UTM Zone 11 - NAD83 :: Data Source: KNC, BC Baseline

C1.4 Miɬ̓qaqas ʔamakʔis Ktunaxa ʔa·qałq̓anuxwatiɬ and Oral Historical Context

Miɬ̓qaqas ʔamakʔis (Chickadee's Land, including the Columbia River), as recalled and recounted by Ktunaxa elders and knowledge holders, provides the context for particular place-based ʔa·qałq̓anuxwatiɬ (Ktunaxa Legends) and other forms of Ktunaxa knowledge. Many of the Ktunaxa's founding stories tell of events, from the epic to the humorous, involving creative powers that have an ongoing role in the Ktunaxa worldview. These stories are anchored in particular places or landmarks within Ktunaxa ʔamakʔis, making these lands alive with Ktunaxa knowledge and history. The Ktunaxa creation story relates the origins of the Ktunaxa people and describes the events and relationships that helped shape – and continue to shape – Ktunaxa ʔamakʔis. Miɬ̓qaqas ʔamakʔis is associated with particular events recounted through the Ktunaxa Creation Story, providing a foundation for Ktunaxa cultural attachment, place names, and connection to the Columbia River and adjacent areas. As told by elder Wilfred Jacobs[13], the creation story tells of the exploits of powerful animal beings that travelled the Kootenay and Columbia valleys, including Arrow Lakes, in a loop, before the rivers were separated, naming the Ktunaxa landscape and helping create it and the Ktunaxa people as they went. As the animal beings passed through the Arrow Lakes and along the Columbia River, Yawuʔnik̓, a powerful water creature, went north into Arrow Lakes from k̓iksiɬuk (Castlegar). As the other animal beings chased Yawuʔnik̓, they shot arrows into a crevice in a rock. Having hit the mark, Yawuʔnik̓ continued past ɬałnu ʔamakʔis (Nakusp) and Ktunwakanmituk Miɬ̓qaqas (Revelstoke), and then along the Columbia River and Kootenay River, before his eventual capture in Columbia Lake. The path of Yawuʔnik̓ established the major river and lake systems and marked the boundaries of Ktunaxa ʔamakʔis that are still used by Ktunaxa citizens today. Other ʔa·qałq̓anuxwatiɬ tell that the Arrow Lakes form the bow of Yawuki·kam, and were gifted to Ktunaxa peoples by Yawuki·kam along with particular rights and privileges secured from other powerful beings. These stories provide the basis for the original French and English names (Arc-Plate or Flatbow) for lower Ktunaxa peoples. Portions of these same stories were told to Franz Boas in the early 20th century and were included in Boas' and Chamberlain's 1918 publication of Kootenay Tales (Boas and Chamberlain 1918).

Other place-based ʔa·qałq̓anuxwatiɬ are more historical in nature. As discussed further in section C3, multiple elders from different families at yaqan nuʔkiy and ʔaq'am talked of a Ktunaxa community on the Arrow Lakes that fought with Kettle Falls, or Colville-based peoples on the Arrow Lakes for decades in the late 18th and early 19th centuries prior to a great battle over access to hot springs on the shores of upper Arrow Lake that were sacred to and protected by the Ktunaxa Xaʔɬɬ̓in society (these are now called Halcyon Hot Springs) just prior to the arrival of the first priests in the Kootenay Lake area. The Ktunaxa on Arrow Lakes were supported militarily by other Lower and Upper Ktunaxa chiefs and by an alliance with Salish speaking neighbours to the west and north. This battle resulted in the removal of Colville-speaking peoples south of the Arrow Lakes, and towards the Inchelium and Kettle Falls areas. It also resulted in the establishment of marriages and alliances with other communities to the north and west. While the exact timing, duration, and extent of this Lakes Colville exclusion is unclear, both Ktunaxa and available written Colville oral histories, and archival records, support an understanding of frequent hostilities between the Ktunaxa and Lakes Colville (or Sinixt) for several decades in the early 19th century, and the eventual movement of Lakes Colville people south of the Arrow Lakes in the 1830's and 1840's. Following the 1860's, relationships between Ktunaxa and Colville-speaking communities on the Arrow

[13] http://www.ktunaxa.org/who-we-are/creation-story/

Lakes appear to have improved and at least one Lakes Colville family (the Christians) lived north of the USA border in the area of what is now Castlegar until the early 20th century.

C1.5 Ethnographic and Historic Background

The Ktunaxa are a distinct indigenous cultural and linguistic group (also referred to in various ethnographic and historic material as Kootanaes, Kootenay, Kutenai, Kutonaqa, Ki'tona'qa, Lakes, Flatbow and other names)[14] historically and currently occupying the Upper Columbia and Kootenay River valleys, and the Selkirk, Monashee, Purcell and Rocky Mountains (including the eastern slopes in present day Alberta). Smith (1984) provides a useful synthesis of Ktunaxa territorial descriptions from prior ethnographers and notes that, "The most notable topographic features of their territory…were the upper Kootenai and upper Columbia valleys, the flanking mountains,[15] and within the valleys of the upper Kootenai and Columbia Rivers" (Smith 1984: 56).

The Ktunaxa are described in the ethnographic literature as including two primary divisions: Upper Ktunaxa (including communities at Tobacco Plains and Columbia Lakes in BC and Elmo in Montana), and Lower Ktunaxa (including communities at Creston, BC and Bonner's Ferry, Idaho). Other historic Ktunaxa communities were located throughout Ktunaxa ʔamakʔis including near present-day Libby and Jennings in Montana, and Michel Prairie (near Sparwood), Burton, Whiteswan Lake, Castlegar, the west arm of Kootenay Lake, and other locations in BC and Alberta. The community at ʔaq'am, BC is generally described as including both Upper Ktunaxa and Lower Ktunaxa. Recognizing that there are differences, including subsistence differences, between communities, and between Upper Ktunaxa and Lower Ktunaxa, existing sources agree that the Ktunaxa, as a whole, hold a common and distinct identity and language, as well as cultural and spiritual traditions, that distinguish them from neighbouring groups, and that have persisted, despite challenge and change, from well prior to 1846 to the present day.

Prior to and following 1846, Ktunaxa groups used, occupied, and firmly controlled an extensive territory, including areas east of the Rocky Mountains and extending west up to, and including portions of, the Columbia River (Turney-High 1941). The Ktunaxa maintained, and continue to maintain, a vibrant subsistence and trade economy throughout Ktunaxa ʔamakʔis. A structured but dynamic annual round included harvesting game, fishing, harvesting cultivated and wild plants, collecting and using mineral[16] and other resources, and trade and other interactions with neighbours. This way of life sustained the Ktunaxa through the arrival of European explorers, traders, priests, miners, and settlers in the 19th century and for most of the 20th century, despite impacts from colonial policies. As far as possible, Ktunaxa citizens continue to maintain and practice their way of life within Ktunaxa ʔamakʔis.

Trade, social intercourse and war relationships existed between Ktunaxa and their neighbours including the Blackfoot (Piikani) and Stoney (Nakoda) peoples east of the Rockies, and Shuswap and other interior Salish (e.g., Sinixit, Okanagan, Kalispel and Colville) peoples to the west. The Columbia River and Arrow Lakes area served as an important area for trade and interaction, including battles, between Ktunaxa and

[14] See Brunton (1998: 236) and Smith (1984: 36-48) for discussion of Ktunaxa and sub-group naming conventions.

[16] The Ktunaxa were proficient prospectors and miners who employed the same methodology as later Europeans, i.e., testing "placer" and "float" occurrences (sic), then following them to the bedrock outcrops where adzes were driven along the richest veins. In addition to silica and tourmaline tool stock, the Ktunaxa also mined iron oxide for paint and soft argillite for making pipes (Choquette 1993).

more western groups until at least the mid-19th century. While primarily passed down orally, Ktunaxa history was also recorded by at least some Ktunaxa leaders using winter counts[17], including one documented by Schaeffer (c. 1937) at Tobacco Plains that recorded events through most of the 19th century, including prior to and following the arrival of Father de Smet in Ktunaxa ʔamakʔis in the early 1840s.

Based on oral histories maintained by current Ktunaxa elders, interviews and histories collected in the late 19th and early in the 20th century by several ethnographers (Chamberlain 1892; Curtis 1911; Boas 1918; Teit 1930; Turney-High 1941; Schaeffer 1935, 1966), as well as archival sources including Canadian census records, missionary accounts, fur trade accounts, records of the former Oatscott reserve, and newspaper records, it is possible to identify at least large portions of the Mid Columbia River, including the Arrow Lakes, as being of critical cultural importance to Ktunaxa families, and continuously occupied by Ktunaxa speaking people since prior to 1846. Detailed oral historic sources, supported by archival records, indicate that an important Ktunaxa village existed north of the Illecillewaet River in the area of present day Revelstoke, that the larger area of Miɬqaqas ʔamakʔis in its entirety, was likely used, occupied, and effectively controlled by Ktunaxa speaking people prior to, and extending beyond, the effective assertion of British, Canadian or American sovereignty in the region. Available information (archival and ethnographic), as well as oral histories and archaeology, support an understanding that the Mid Columbia River and Arrow Lakes were culturally and linguistically complex, but that areas including near present day Halcyon, Beaton Arm, Nakusp and Burton, have been continuously used and occupied by Ktunaxa peoples, including Upper and Lower Ktunaxa peoples, since prior to 1846.

C1.5.1 Ktunaxa Seasonal Round and Associated Rights and Title

Within the Arrow Lakes and Mid Columbia River, the Lower Ktunaxa, including the Arrow Lakes community, traditionally relied upon an annual round that relied on fishing, hunting, trapping and gathering plant foods and medicines. Available ethnographic and oral historical information indicates that the [Lakes] Ktunaxa of the Arrow Lakes region relied heavily on an annual round that emphasized fishing for sturgeon as well as salmon, kokanee, and other species, as well as harvesting of waterfowl and fur, and hunting for caribou, sheep, deer, elk and goat, as well as other species in the Columbia valley and adjacent valleys. There were close political and kinship ties with other permanent Ktunaxa communities located west of the Rocky Mountains, particularly after the arrival of the European fur trade, European diseases, and the expansion of the Blackfoot Confederacy in the late 18th and early 19th centuries (Schaefer 1935, Turney-High 1941). Ktunaxa communities also hunted bison along the sheltered eastern slopes of the Rockies in the winter season, or farther afield on the plains in summer and Lower Ktunaxa families occasionally travelled with relatives in the bison hunt (Schaeffer 1935). Salmon remained a critical resource for Lower and Upper Ktunaxa communities along the Columbia drainage until the construction of the Grand Coulee Dam in Washington State in the 1930s made it impossible for salmon to return to the Upper and Mid Columbia River. Ktunaxa families in the Arrow Lakes area travelled regularly to the area of Fort Shephard and Fort Colville in the 19th century. Long distance travel by Lower Ktunaxa peoples was primarily by canoe along the Columbia and Kootenay Rivers, but important trails connected what is now the Beaton Arm of Upper Arrow Lake to the northern end of Kootenay Lake via the Trout

[17] A winter count is a pictorial representation of important events, usually involving a single symbol or event per year, recorded on hides, and later paper, and used as a mnemonic device for remembering and recounting historic events.

Lake area. Other important trails connected the Burton and Nakusp areas to Kootenay Lake via Slocan Lake and the Kaslo (qaɬsu) river valley.

As discussed further below, Ktunaxa oral histories and ongoing land use indicates that Ktunaxa citizens have relied on and, to the extent possible, continue to rely on, the and Upper and Mid Columbia River, including the area surrounding Revelstoke, and north at least as far as the Big Bend and Kinbasket Reservoir area, for a range of practices including the harvesting of fish, plant, wildlife, and mineral resources, trails and transportation routes associated with the seasonal round and oral histories, and associated camps, cultural areas, and practices. Ktunaxa citizens, especially those living in the Revelstoke area, at yaqan nuʔkiy near Creston, and ʔaq'am near Cranbrook see a direct connection between the historic Ktunaxa community and annual round on the Arrow Lakes, ongoing family relationships and cultural practices on the Arrow Lakes and Mid Columbia River, and economic benefit from the development and trade of resources, such as minerals, but also including other resources such as electricity generated from use and storage of water:

> *We have to remember the history, and that we were miners as well … on the road to Moyie, - somewhere out there, are mineshafts that are thousands of years old, or hundreds of years old. Anyways they predate European contact. We were miners. As an aboriginal right, we have a right to mine minerals from the land and to trade it. We traded it. Our stone traveled across the land and to different tribes and different nations and we traded it for value. Whatever that value was, we traded it... And because of our history … and because we were excluded from participation … I think it's only right that we get a fair share now (S01 June 28 2012).*

Based on available information, and considering ongoing Ktunaxa practice within living memory, there is strong evidence that the Ktunaxa Nation has maintained continuous practice of rights, including harvesting, management, and exclusive indigenous control, in portions of the Mid Columbia River valley, and alongside neighbouring nations, since prior to 1846. Based on existing information, the nature of Ktunaxa practice is consistent with a wide suite of aboriginal rights, at a minimum:

- Aboriginal title over portions of the Columbia River and its valley within Miɬqaqas ʔamakʔis, including drainages flowing from the east.[18]
- Agricultural rights (including cultivation and grazing rights);
- Fishing and water rights, including rights to water and riparian access and use;
- Cultural rights, including rights of access, naming, habitation, occupation, and practice;
- Rights to harvest and trade fish, animal, tree, and plant resources;
- Rights to harvest, mine, and trade sub-surface mineral resources;
- Rights to governance, stewardship, and decision-making within Miɬqaqas ʔamakʔis;[19]
- Rights to build and occupy living structures; and

[18] Based on available information, Ktunaxa use and occupancy in these areas has been regular and continuous, and acting in alliance with neighbours, included the ability to exclude other groups, notably Colville Lakes groups prior to 1846, and American prospectors in the 1860's.

[19] Examples include the stewardship of water, landforms, plants, minerals and wildlife, management of resources, and many other aspects, including those identified in the 2007 United Nations Declaration on the Rights of Indigenous People.

- Rights to travel throughout the area.

C1.6 Ktunaxa Population

Table C5-1 profiles some of the demographic characteristics of the Ktunaxa Citizen First Nations. Key statistics based on Indigenous and Northern Affairs Canada (INAC) registered population[20] as of 2016 were as follows:

- ʔakinkum̓ɬasnuqɬiʔit (Tobacco Plains Band): 206 (113 or 55% off reserve)
- ʔaq̓am (St. Mary's Band): 391 (173 or 44% off reserve)
- yaqan nuʔkiy (Lower Kootenay Band): 238 (117 or 49% off reserve)
- ʔakisq̓nuk (Columbia Lake Band): 273 (118 or 43% off reserve)

In 2011, City of Revelstoke Aboriginal people made up 5.5 per cent (395 individuals) of Revelstoke's population of about 7,139. This proportion is slightly higher than the 5.4 per cent reported for the BC Aboriginal population in the province (Statistics Canada 2011a). More than 45 per cent of the 395 Aboriginal people in Revelstoke identified as Métis and 145 (or 36.7 per cent) identified as First Nations[21] (Statistics Canada 2011b).

As with most Indigenous Peoples in Canada, Ktunaxa economic well-being currently lags below that of other Canadians. The 2009 Ktunaxa Census estimated that the average Ktunaxa individual income was $24,380, with a median income of $17,987.[22] Just over 50 per cent of respondents made below $20,000 in 2009. In 2009, the average individual income of Revelstoke residents was $37,104 (CBRDI 2013), much higher than the average reported for Ktunaxa the same year.[23] Average and median incomes for the Ktunaxa at present appear to equate to the income level reported for British Columbians about 15 to 20 years ago. According to BC Stats (2009a), the Ktunaxa have higher participation rates in the wage economy than the BC Aboriginal average. However, the 2009 Ktunaxa Census estimates an unemployment rate of 49 per cent among working age (18 to 65) people (Phillips 2010).

Many Ktunaxa citizens live off reserve (on and off-reserve numbers are almost equal), possibly due to factors including a lack of on-reserve economic opportunities, persistent social issues, and inadequate quantity and quality of housing, schooling, and health care. Overall, community well-being indices in Ktunaxa Nation on reserve communities are substantially lower than those of the region's non-Aboriginal communities (KNC 2010; BC Stats 2011, see table C4-1).[24]

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[20] Federal registered population numbers only include Ktunaxa citizens who are considered Indians under the federal Indian Act.
[21] Any comparison of Aboriginal data across Census years must adjust for incompletely enumerated reserves and settlements. Some Indian reserves and settlements did not participate in certain Census years as enumeration either was not permitted or it was interrupted before completion (Statistics Canada, 2006 Census, www12.statcan.ca/census-recensement/2006/ref/info/aboriginal-autochtones-eng.cfm)
22 According to BC Stats (2010), the median BC individual income in 2001 was $22,095, more than $4,000 higher than the median Ktunaxa citizen income in 2010.
[23] This comparison does not include average income growth among the non-Aboriginal population in the interim between 2006 and 2009. According to BC Stats (2010), the average income of a BC wage earner grew by over 10 per cent between 2006 and 2009.
[24] BC Stats (2011) states that comparisons between the 2001 and 2006 Censuses should be done with caution. There were very large increases in the number of persons identifying as Aboriginal peoples between the Censuses, an increase well above what would be expected from a natural increase. The explanation of why the growth is so high is that the willingness of Aboriginal people to identify has been increasing over time, particularly among those over 35 years of age and the Métis. Any comparisons made

C1.7 Ktunaxa Governance

> *ʔaknumuɬtitit is our word for the law given to the Ktunaxa by the Creator. It is a powerful word and speaks to why we were put on this land. We were born into this land and someday we will return through death. The Creator put us here for a reason and that purpose is to take care of the land and its resources.*
>
> *The law of the land, ʔaknumuɬtitit, is the law for survival. The law protects the values inherent in the land. The land gives us the resources to survive, and in return, we uphold our covenant with the Creator to protect and not overuse the land.*
>
> *This Ktunaxa law is grounded in the fact that all things are connected and must be kept in balance. It is also the foundation of our spirituality – that of being humble in our limited understanding and of being respectful of our role within nature and with other creatures, as well as being respectful and acknowledging the Creator and our ancestors. (Ktunaxa Nation 2010)*

The Ktunaxa Nation and its governance systems predate the arrival of European settlement and associated colonial government. As neither treaty, *terra nullius,* nor war applies, ancestral Ktunaxa laws and rights remain in place.

The Ktunaxa Nation has a clear vision for its future that includes ambitious goals for community health, language and culture, the stewardship of lands and resources, economic sustainability, and self-government:

> *As a Nation we are striving to achieve strong, healthy citizens and communities, speaking our languages and celebrating who we are and our history in our ancestral homelands, working together, managing our lands and resources, as a self-sufficient, self-governing Nation. (Ktunaxa Nation AGA 2000)*

The Ktunaxa Nation Council, the governing body of the Ktunaxa Nation, is comprised of the elected council of each of the four communities in Canada. The Ktunaxa Nation Council has established the Ktunaxa Nation Executive Council to carry out day-to-day decision-making on behalf of KNC. It includes the Chief of each of the four communities in Canada and the Chair of each of the Sector Councils as set out in the organizational structure of KNC. It organizes its programs according to five pillars of nation rebuilding:

- Traditional Knowledge and Language Sector;
- Economic Investment Sector;
- Education and Employment Sector;
- Social Sector; and
- Lands and Resources Sector.

The Core Support Services, which consists of strategic planning, financial management, human resources, information technology, communications, buildings and infrastructure, events coordination,

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between Censuses of the characteristics of Aboriginal people, such as their unemployment rates or educational attainment, should therefore be made with caution, as changes may be due primarily to the difference in who identified between the two periods.

and administrative support, are part of the common operational and functional requirements of the sectors.

The Ktunaxa Lands and Resources Council (KLR) is a standing committee of the Ktunaxa Nation Executive Council, with the authority and mandate to make lands and resource decisions on behalf of the Ktunaxa Nation within Ktunaxa ʔamakʔis off reserve. One member from each community's elected Chief and Council sits on the KLRC.

The KLR is the operational entity responsible for managing the lands and resources within the Ktunaxa ʔamakʔis. They provide support to, and take direction from, the KLRC. The KLR is responsible for land stewardship, research and planning (including land use planning, traditional use studies, policy development, and research), cultural resources, negotiations with third parties on lands and research projects, and information management.

As discussed in Section C1.1 KNC exercises governance, sets policy, and conducts planning in order to benefit their citizens and uphold their stewardship responsibility to the land and resources in Ktunaxa ʔamakʔis. These three functions are essential to the Nation's autonomy and to its ability to protect the title rights and interests of its citizens, and as such are fundamental Aboriginal title and rights. Ktunaxa policies, standards and accepted practices (collectively referred to as policies) are intended to guide and assist the Ktunaxa in exercising stewardship and management responsibilities for lands and resources in the Ktunaxa ʔamakʔis. Policies are an important tool for self-governance and for communicating to, and collaborating with, other levels of government and other parties in order to support consistency, transparency, and coordination in achieving policy goals.

C1.7.1 Ktunaxa Land Use Stewardship and Policy

The vision statement for the KLR provides an indication of the core values and goals that guide KNC lands governance:

> *As a Nation we are striving to achieve strong, healthy citizens and communities, speaking our language(s) and celebrating who we are and our history in our ancestral homelands, working together managing our lands and resources within a self-sufficient, self-governing Nation - from the Land and Resources Sector Policy Framework.* (Ktunaxa Nation Council, 2011)

Another important policy document, Qat'muk – Stand Our Ground, in the 2012 KNC Annual Report for the Ktunaxa Nation (KNC 2012), states:

> *We…envision ourselves working together as one Nation to responsibly care for the lands and resources within our Territory. Our stewardship of the lands and resources will be based on our sacred covenant with the Creator and our traditional values of:*
>
> - *Ensuring land, air and water will be clean and healthy.*
> - *Ensuring access to, and protection of, traditional foods and medicines.*
> - *Balancing the economic use of land with cultural and spiritual values.*
> - *Ensuring that long-term sustainability and ecological integrity take precedence.*

- *Following natural law; taking only what you need.*

We envision a healthy environment in which all Ktunaxa people can move freely throughout the Territory. We will exercise our rights to derive benefits from the lands and resources without compromising the future for our grandchildren and their grandchildren. Not only will our past heritage be preserved but we will be developing new connections with the land and each other.

We envision ourselves playing a central role in all decisions pertaining to lands and resources in our Territory. We will manage the lands and resources through healthy working relationships among ourselves and with others based on understanding, respect and equality. (KNC 2012)

The Ktunaxa Lands and Resources Sector Policy Framework (KNC 2011) sets out authoritative policy statements of KNC, KLRC, and KLR. The Ktunaxa principle of ʔa·kxaṁis ḳapi qapsin can be translated to mean a responsibility for stewardship of all living things. Ktunaxa stewardship principles (Yaqaŧ Hankatitiŧki na ʔamak) are described in Section C7.

C1.7.2 Status of Treaty Negotiations

The Ktunaxa Nation is currently engaged in the BC Treaty process with Canada and BC on a government-to-government basis. This process is currently in stage four of the six-stage treaty-making process, and involved parties are negotiating an Agreement in Principle (AIP), which, if approved, may form the basis for a Final Agreement.[25]

C1.7.3 Government-to-Government Relationship

The Ktunaxa Nation engages in government-to-government relationships consistent with the 2007 United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP). In October 2010, the Province of BC and Ktunaxa Nation Council signed a Strategic Engagement Agreement (SEA) that provides for government-to-government discussions on natural resource decisions within Ktunaxa ʔamakʔis. The SEA was renewed in 2013 and will expire in 2016. From the SEA information website, Kathryn Teneese, Director and Chief Negotiator at Ktunaxa Nation Council, states:

Ktunaxa remain unwavering in our role as stewards of this territory. As the Ktunaxa Nation and the Province continue to move towards shared decision-making in relation to land and resources within our territory, we look forward to building upon the successes of the past three years while continuing to develop our government-to-government relationship with the Province. The renewed of the Strategic Engagement Agreement is another positive step forward in this relationship. (December 12, 2013)[26]

C1.7.4 Ktunaxa to Industry Relationships

KNC maintains strong relationships with other industry partners, negotiating and implementing protocols, consultation agreements, resource revenue sharing agreements, and others (Ktunaxa Nation 2015a).

[25] For more information, see: http://www.ktunaxa.org/treaty/negotiations_what.html
[26] http://www.newsroom.gov.bc.ca/2013/12/renewed-agreement-strengthens-relationship-with-ktunaxa-nation.html

C1.8 Methods

The Ktunaxa Nation views their title rights and interests as extending far beyond the protection of traditional hunting, fishing, trapping, and gathering practices. For the purpose of this section, the assessment of the Project on Ktunaxa rights and interests is organized into sectors that align with the five pillars described in Section C.1.6. Two overarching issues (water and cumulative effects) are discussed separately because they cross all five sectors. The resulting sections are:

- Water (C2);
- Traditional Knowledge and Language Sector (C3);
- Economic Investment Sector (C4);
- Education and Employment Sector (C5);
- Social Sector (C6);
- Lands and Resources Sector (C7); and
- Cumulative Effects (C8).

Baseline data collection and assessment methods for each of these sections are described below.

C1.8.1 Baseline Data Collection

C1.8.1.1 Determination of Valued Components

Consistent with standard assessment practice, a valued component (VC)[27] is an important aspect of the environment that a project has the potential to effect and that is considered within an environmental assessment (Hegmann et al. 1999). The identification of VCs provides a way to focus on what is most important regarding a particular project. The VCs for this assessment were determined through:

- An initial Valued Component scoping meeting with KNC representatives and BC Hydro held in Revelstoke in July, 2014;
- Firelight literature and gap analysis;
- CORE Committee Meetings – (joint technical meetings with BC Hydro, First Nations and other technical representatives);
    - March 5 and 6 2015 - BC Hydro presented draft AIR and VC documents;
    - September 14, 15 and 16, 2016 BC Hydro presented hydrological model, archaeology and terrestrial VCs presented;
    - October 4 and 5, 2016 archaeology, aquatic and terrestrial VCs reviewed;
- BC Hydro and First Nations Section C writing meeting in Revelstoke, September 10, 2015;

[27] Valued ecosystem component is another term frequently used, but it focuses on biophysical resources. This report uses the more general term valued component (VC) in relation to Ktunaxa knowledge and use values, as VCs may include tangible or biophysical resources (particular places or species), as well as more social- or knowledge-based VCs such as governance, place names, or community health.

- Meeting with Bill Green and Vi Birdstone May 2015 regarding key concerns related to Revelstoke 5 and additional study gaps;
- KNC Review of BC Hydro Valued Components document April 2015;
- Conference calls with KNC project leads and specific discipline leads over the summer and fall of 2016;
- KNC kick-off and scoping meeting for Section C with KNC discipline leads January 2016 in Cranbrook;
- KNC-BC Hydro meeting regarding baselines for socio-ec and cumulative effects March 9 and 10 2016;
- A mapping training session for Aboriginal Interest and Use Study interviews in March 2015;
- A 2-day workshop on Section C drafting and cultural baseline November 21 and 22, 2016 in Cranbrook;
- A series of interviews with 10 community knowledge holders in the spring and summer of 2015;
- Field studies August 15-17, 2016 with Wayne Louie, Joanne Fisher and Robert Williams; and
- The review of other materials, including KNC internal governance, policy and planning objectives for the Columbia River, including the Arrow Lakes area.

VCs were reviewed and confirmed by KNC staff in January 2016. Because of the interdependence of the five sectors, VCs are often applicable to more than one sector and in some cases apply to all five sectors. For the purposes of this assessment, VCs have been allocated primarily to one sector, and are cross-referenced under other sectors. Because water cuts across all sectors, it is addressed separately. Cumulative effects are also addressed in a separate section.

Table C1-1 shows each VC listed under the primary sector to which it is relevant, and cross-referenced to other relevant sectors.

Table C1-1 Valued Components by Sector for the Revelstoke Generating Station Unit 6 Assessment

Sector/VC	Indicators or Measures	TK / Lang.	Educ. and Employ.	Econ. Invest.	Social	Lands & Res.
Water (Cross Sector)	Assessment included at the Sector level	✔	✔	✔	✔	✔
Traditional Knowledge and Language	Ktunaxa language and culture (intangible cultural resources)	✔	✔		✔	
	Cultural areas and properties (tangible cultural resources) including all site specific and non-site specific use and occupancy values.	✔		✔		✔
	Future Ktunaxa relationship with and knowledge of the land	✔			✔	✔
Economic Investment	Business development		✔	✔		
	Ktunaxa rights-based economy		✔	✔		
Education and Employment	Education and training		✔	✔	✔	
	Employment		✔	✔	✔	
Social	Housing, transportation and social services		✔	✔	✔	
	Ecological approach to human health, and confidence in wild foods	✔	✔	✔	✔	
Lands and Resources	Biodiversity, including rare and culturally important ecosystems, wildlife, plants, fish	✔	✔	✔	✔	✔
	Sediment and shoreline erosion	✔			✔	✔
	Archaeology	✔				✔
Cumulative Effects (Cross Sector)	Assessment included at the Sector level	✔	✔	✔	✔	✔

C1.8.1.2 Data Sources

C1.8.1.2.1 Common Data Sources for all VCs

Consistent with the Project's proposed Application Information Requirements (BC EAO 2016),[28] BC Hydro and KNC undertook a collaborative approach to supporting the development of a KNC-directed study to support the Application, including the development of strategies to avoid or mitigate impacts, and maximize benefits, to Ktunaxa title rights and interests. Sources of information relied upon through baseline data collection and assessment include:

- Archival, ethnographic, and oral historical material held by, or made available by KNC;
- Internal KNC data and documentation relevant to the Project, including internal planning and policy documents and data collected in past KNC studies;

[28] Environmental Assessment Office, 2016. Revelstoke Generating Station Unit 6 Project. Approved Application Information Requirements. BC Environmental Assessment Office, May 2016.

- Primary interviews with KNC staff, Ktunaxa elders, and Ktunaxa knowledge holders regarding Ktunaxa knowledge, use and occupancy in the Upper and Mid Columbia River Valley and Arrow Lakes, conducted in 2015 and 2016; and,
- Additional primary Interviews conducted in 2015 and 2016 with KNC staff, Ktunaxa elders, and Ktunaxa knowledge holders regarding the Project and Ktunaxa knowledge, use, and occupancy, specifically of relevance to the Revelstoke 6 Project.

These information sources provided baseline data and analysis used to assess the potential effects of the Project. The available baseline information is limited by level of participation, methodology, schedule, and funding. Baseline information should be considered open to verification, update, and elaboration through ongoing consultation and engagement between BC Hydro and KNC during the Application review period and beyond.

C1.8.1.2.2 VC-specific Data Sources

Water

This section relies on the Project description, draft baseline information provided by BC Hydro, information from KNC staff and Ktunaxa knowledge holders as well as secondary sources. Key information sources include:

- Draft hydrological model results including TELEMAC modeling provided by BC Hydro
- Field tour with Ktunaxa knowledge holders in August 2016
- Recorded interviews with Ktunaxa knowledge holders in 2015 and 2016
- Fish and Fish Habitat Baseline (section B.XX)

Ktunaxa Knowledge and Language

This section relies on information provided by BC Hydro, information from KNC staff and Ktunaxa knowledge holders as well as archival review of primary and secondary sources. In 2015 and 2016, the Ktunaxa Nation undertook a Ktunaxa Knowledge, Use and Occupancy Study to document Ktunaxa practice of rights and interests in the area of Mi¢qaqas ʔamakʔis (Land of the Chickadee), focusing on the upper Arrow Lake to Mica Dam, including areas within and adjacent to the Revelstoke Dam and the proposed Revelstoke Unit 6 Project. This work built on Ktunaxa information collected by Vi Birdstone and others through the Revelstoke 5 and Mica 5 and 6 processes, as well as other studies. A total of 15 Project-specific interviews were conducted with Ktunaxa knowledge holders, including broader oral history interviews, and mapping interviews focussed specifically on the Revelstoke area and areas downstream to approximately the area of Burton, BC. Information was considered within the context of ethno-historic and archival research, as well as relevant information from past Ktunaxa studies. The majority of interviews took place between March and August 2016. All interviews included documentation of prior informed consent (see Appendix C1.8.1-1). Interviews followed a standard interview guide designed to meet the needs of the study and to provide a consistent but flexible framework for soliciting and recording responses (see Appendix C1.8.1-2). Not all Ktunaxa knowledge holders familiar with Mi¢qaqas ʔamakʔis were able to participate. Absence of data does not mean absence of use or interest. Dr. Craig Candler of Firelight and Robert Williams of KNC led or facilitated the interviews, with Andrew

Thompson (Firelight) and Natasha Bourgoyne (KNC) assisting and providing GIS and mapping support. All data are maintained by KNC Lands and Resources Sector.

All interviews were recorded through digital audio recording, digital video recording of the map surface, and interview notes captured on interview forms or in notebooks. Questions were designed to gain an understanding of the participant's background and relationship to the Project area, and of patterns of avoidance and use, including hunting, trapping, fishing and related practices, and how the participant's use has changed over time. Location-specific data were mapped using points, lines, or polygons. Where possible, temporal information regarding the season and the year were recorded. Interviews averaged approximately two hours, with the longest lasting approximately four hours. For Project-specific interviews, areas in the vicinity of the Project LSA were emphasized, but interviews addressed areas throughout the regional study area (RSA; see figure C1-3, for definitions of these areas see C12). All interviews were conducted in English, though Ktunaxa terms and names were frequently used.

Interview and mapping protocols were based on standard techniques (Tobias 2009). Map data were captured and managed using Google Earth based direct-to-digital mapping on-screen, with mapping of site-specific values at a scale of 1:50,000 or better (eye height of 10km or less). Appendix C1.8.1-3 contains additional details on the mapping process. Interview data were collected so that disaggregation of individual participant data is possible, and first hand and second hand information is distinguishable.

Language and culture (intangible cultural resources)

Consistent with Article 2 of the UNESCO Convention for the Safeguarding of Intangible Cultural Heritage[29], the valued component of Ktunaxa Language and Culture (intangible cultural resources) is understood to include non-site specific values including place names, oral histories, cultural landscapes[30], intergenerational transmission of knowledge, and sense of place, including confidence in the ability to safely practice skills and values that are based on Ktunaxa knowledge and cultural practice, but which may be spatially indistinct or difficult to record using maps. Preferred species and resource-based non-site-specific values are considered under Ktunaxa Lands and Resources (Section C7).

[29] Article 2 (1): "intangible cultural heritage" means the practices, representations, expressions, knowledge, skills – as well as the instruments, objects, artefacts and cultural spaces associated therewith – that communities, groups and, in some cases, individuals recognize as part of their cultural heritage. This intangible cultural heritage, transmitted from generation to generation, is constantly recreated by communities and groups in response to their environment, their interaction with nature and their history, and provides them with a sense of identity and continuity, thus promoting respect for cultural diversity and human creativity…
Article 2 (2): The "intangible cultural heritage", as defined in paragraph 1 above, is manifested inter alia in the following domains:
(a) oral traditions and expressions, including language as a vehicle of the intangible cultural heritage;
(b) performing arts;
(c) social practices, rituals and festive events;
(d) knowledge and practices concerning nature and the universe;
(e) traditional craftsmanship.
(UNESCO, http://www.unesco.org/culture/ich/index.php?lg=en&pg=00022#art2 accessed May 16, 2013).

[30] Parks Canada defines an aboriginal cultural landscape as: "a place valued by an Aboriginal group (or groups) because of their long and complex relationship with that land. It expresses their unity with the natural and spiritual environment. It embodies their traditional knowledge of spirits, places, land uses, and ecology. Material remains of the association may be prominent, but will often be minimal or absent." (Parks Canada, http://www.pc.gc.ca/eng/docs/r/pca-acl/index.aspx, accessed July 16, 2012)

Cultural areas and properties (tangible cultural resources)

For the purpose of this report, Cultural areas and properties (tangible cultural resources) include site-specific values that may be mapped and are reported as specific and spatially distinct (though the locations may be considered confidential). Site-specific values, such as cabins, or kill sites, reflect specific instances of use that anchor the wider practice of rights and livelihood within a particular landscape. A particular elk kill site may be mapped with a precise point, but that value is correctly interpreted as an anchor, or focal point, for a wide spectrum of other related livelihood practices and values in the area. These can include wider hunting areas covered in efforts to find the elk, practice of navigation and tracking in order to access it, religious or ceremonial practices that may be associated with the hunt, food processing and preparation techniques to use it, and the range of social relationships and knowledge transmission (teaching) activities that are required for a successful hunt to occur. In other words, every mapped site-specific value implies a much wider range of activities, and a wider geographic area, upon which the meaningful practice of that use relies. The actual area covered by recorded site-specific use values should be understood as a tiny portion of the area actually required for the meaningful practice of Ktunaxa livelihood.

Documentation of site-specific data included five classes of site-specific values:

- subsistence values (including harvesting and kill sites, plant food collection areas, and trapping areas);
- habitation values (including temporary or occasional, and permanent or regularly used camps and cabins);
- cultural/spiritual values (including place names, burials, gathering places, ceremonial areas, and medicinal plant collection areas);
- transportation values (including trails, water routes, and navigation sites such as landmarks, or passes); and
- environmental feature values (including specific highly valued fish or wildlife habitat, mineral licks, or other specific environmental features).

Economic Investment, Education and Employment, and Social Sectors

To add to information collected through primary sources and determine baseline and trend data for social and economic indicators for each valued component, the Firelight Group accessed secondary information from:

- Data and analysis by KNC of the 2009 Ktunaxa Census (2010) as well as the census update in 2015;
- Data provided by SNC Lavalin and BC Hydro regarding the Project;
- BC Government and Statistics Canada information; and
- Other published or Internet data sources.

Quantifiable social and economic indicators are challenging to select for any project, as it is difficult to gauge the direct, indirect and induced effects of a specific project on broad social and economic conditions, which tend to be affected by a wide range of other factors. As a further complication, in many instances baseline data are not easily accessible. Where quantitative baseline data was not available, qualitative methods have been used to identify gaps in the relationship between Ktunaxa (citizens/potential workers, businesses, KNC departments) and BC Hydro that may be constraining the ability of Ktunaxa to take full advantage of economic activities occurring on their lands. In some cases, KNC has identified opportunities for improvement rather than impacts, putting the emphasis on maximizing benefits while avoiding impacts.

Lands and Resources Sector

No ecological fieldwork specific to Ktunaxa rights was conducted by KNC in the RSA or LSA. The assessment of land and resources valued components for this section relies upon Section B of this application, including:

- Hydrology and fluvial geomorphology (Section 4.1.1);
- Air and noise (Section 4.1.2);
- Soil (Section 4.1.3);
- Fish and fish habitat (Section 4.2);
- Ecological communities (Section 4.3);
- Plants (Section 4.4);
- Herptiles (Section 4.5);
- Birds (Section 4.6); and
- Mammals (Section 4.7)

Endpoints for assessment in this section are different from those for related valued components in Section B, and, as such, characterization of project effects and confidence rating may also be different. Additional information for this section was collected through interviews with key Ktunaxa staff members, and through review of the following information sources:

- Draft Ktunaxa land use planning documents;
- Technical reports (as cited in text);
- Communications with Ktunaxa knowledge holders and other specialists (identified as personal communications, or pers. comm.);
- Recorded interviews with Ktunaxa knowledge holders in 2015 and 2016;
- Revelstoke Generating Station Unit 6 Project Environmental Assessment; and
- Field visits to sites in the Project LSA and RSA with Ktunaxa knowledge holders.

C1.8.1.3 Temporal and Spatial Boundaries

The temporal boundaries for baseline data collection include past, present, and planned future Ktunaxa Nation rights and interests. For the purpose of this study, a past value refers to an account of Ktunaxa knowledge and use prior to living memory; a present value refers to an account of Ktunaxa knowledge and use within living memory of Ktunaxa participants; and a planned future value refers to anticipated or intended Ktunaxa knowledge or use patterns.

Spatial boundaries for baseline collection included a Local Study Area (LSA) defined by a 5 km buffer[31] around the Project disturbance boundary and 5 km around downstream areas within the Mid Columbia River to approximately the area of Arrowhead. As described in the Part B baseline sections, relatively intense Project-related disturbance can be expected within the LSA as a result of construction impacts and Project attributable changes in peak and moderate flows, as well as erosion, through the operations period. A larger regional RSA defined by downstream areas of Miɬqaqas ʔamakʔis within 5 km of receiving waters and to approximately the area of Burton, BC, where direct or indirect effects of the Project—including cumulative effects, changes in operation of other hydro-electric facilities (particularly Keenleyside Dam near Castlegar), and Project attributable changes in the ability of Ktunaxa Nation citizens to practice cultural rights may occur, especially where these are dependent on water-based transportation or downstream riparian integrity and abundance of culturally important migratory animal or fish populations including aquatic or semi-aquatic furbearers, mountain caribou, kokanee, sturgeon, and anadromous salmon, as well as culturally-specific criteria for confidence in the quality of water. For the purpose of this study, available information is considered within the boundaries of Miɬqaqas ʔamakʔis (Chickadee's Land) as shown in Figure C1-3 as this provides a Ktunaxa relevant management unit within which the movement or distribution of sensitive and culturally important animals, including ungulates (e.g., elk, deer, moose and caribou), aquatic furbearers (e.g. river otter, beaver, muskrat, mink), carnivores (e.g., grizzly bear, wolverine, fisher), and fish (e.g., white sturgeon, kokanee, salmon, trout) may be impacted by the Project.

The Project lifespan is understood to include a brief construction phase followed by a very long period of operations. The Ktunaxa Nation also considers potential for a closure and reclamation stage that would remove Revelstoke infrastructure from the Columbia River. Activities associated with these stages are described in A3 (Project Description):

- Construction activities would be minimal given the existing infrastructure, take approximately three years and are anticipated to result in approximately 20 person years of employment (approximately 39,000 person hours).
- Operations are assumed to last approximately 50 years (2020 to 2060).
- Closure and reclamation activities are poorly described by BC Hydro, but are assumed to take place after the useful life span of the Project is complete. Reclamation and closure would require removal of Revelstoke infrastructure, re-establishment of unregulated seasonal flows, and

[31] Five kilometres (just over three miles) is an approximation of the distance easily travelled in a day trip from a point (such as a cabin, camp or other location) by foot through bush, as when hunting, and returning to the point of origin (Candler et al. 2010: 29). It is used as a reasonable approximation of the area of regularly relied upon resource use surrounding a given transportation or habitation value.

restoration of ecosystem processes. It is anticipated that monitoring and maintenance would be required for an extended period following closure in order to support and demonstrate restoration success.

Potential effects of the Project on Ktunaxa interests and use are in addition to the effects of existing BC Hydro operations in the Mid Columbia River. They are expected to begin during construction and to accumulate over time during operations, largely as a result of changes in the flow regime of the Columbia River, including higher peaking, especially in winter. During reclamation and closure there would be a reduction in effects and a re-establishment of unregulated or less regulated flow patterns, but longer-term effects on Ktunaxa interests and use are anticipated until and beyond the successful completion of reservoir and downstream reclamation. Due to permanent changes to the landscape and the "taking up" of lands over multiple human generations (generally defined as between 20 and 25 years), with the resulting potential interruption of traditional use and knowledge transmission regarding the area, many of the effects on Ktunaxa interests and rights are considered permanent.

C1.8.2 Assessment Methods

To facilitate the consideration and integration of findings, the methods used in residual effects characterization are generally consistent with standard methods recommended under CEAA practitioner guidance and related documents. Like many social and ecological values, Ktunaxa traditional use values exist within an ongoing process of interdependent environmental, cultural, economic and social change that is rooted in the past and extends into the future.

Knowledge and use values, like ecosystem values, are not static. The assessment of impacts provides a prediction of likely future change resulting from the Project given available information. Ktunaxa knowledge and use involves complex and dynamic cultural and ecological systems where what appear to be minor changes in a single component may have larger and unexpected consequences for the whole.

C1.8.3 Residual Effects Characterization

Residual effects are those effects that remain following the full implementation of mitigation measures. In this assessment, generally consistent with the methods used in other assessments within Section B of this application, and with Canadian Environmental Assessment Agency guidance documents (Hegmann et al. 1999), residual effects are characterized based on criteria outlined below:

- **Direction** of an impact may be positive, neutral or negative with respect to the baseline (e.g., a change resulting in increased traditional use would be classed as positive, whereas a change resulting in decreased traditional use would be considered negative);
- **Magnitude** describes the intensity, or severity of an effect. It is the amount of change in a measurable or perceivable parameter or variable relative to the baseline condition, guideline value, context, or other defined standard. In the case of effects on Ktunaxa knowledge and use, magnitude was determined based on a qualitative and quantitative (where possible) evaluation of VCs potentially affected (as discussed in the baseline). Factors considered include:
  - Vulnerability of value or sensitivity to change (high/low);
  - Cultural importance (high/low);
  - Rarity of similar values within the LSA/RSA (high/low);

- Intensity of likely community concern (high/low); and
- Degree of likely change in use practice (high/low).

- Where change is predicted to be discernible but low in all factors, magnitude is considered to be low. Where change is predicted to be discernible and only one factor is high, magnitude is considered to be moderate. Where change is predicted to be discernible and more than one factor is high, the magnitude is considered high.
- **Geographic extent** is the spatial area affected by a specific project. It is generally based on the local and regional study areas developed. Effects within the LSA only (within 5 km of footprint) are considered to be local, effects extending into the RSA are considered to be regional (even if they diminish in magnitude), and effects that extend outside the RSA are considered to be beyond regional.
- **Duration** refers to the length of time over which an environmental impact occurs. It considers the various stages of a project, including construction, operation, reclamation and closure, during which the effects may occur, as well as the length of time for the environmental component to recover from the disturbance.
- **Reversibility** indicates the potential for recovery of pre-project patterns or conditions of use and knowledge. An effect is defined as not reversible if the VC cannot be restored to pre-impact condition within the long term as defined under duration. Because traditional knowledge and use is dynamic, a value is considered restored if pre-existing cultural transmission and use patterns are restored. Reversibility is achieved where transmission and use are restored to the point of moving toward a condition that is essentially indistinguishable from pre-existing cultural transmission and use patterns. For this to occur, both the physical/economic and cultural/spiritual relationships between people and land need to return to pre-existing patterns. Due to the importance of intergenerational transmission to the survival of cultural knowledge and cultural landscapes, where an area will be removed from Aboriginal use for one generation (generally between 20 and 25 years) or more, impacts to the transmission of knowledge regarding that area are considered permanent (irreversible).[32]
- **Frequency** describes how often the effect occurs within a given time period and is classified as low (occurring less than once a year), medium (occurring on a monthly basis) or high (ongoing, or more than once per month) in occurrence. Seasonal effects (intermittent, but effect may last for weeks or months) are considered to be of medium frequency. Continuous effects are considered to be of high frequency.
- **Probability** describes the likelihood of the effect occurring and is classified as low (possible, but unlikely to occur) or high (certain, or likely, to occur).

[32] This approach is consistent with that taken in other environmental assessments, and with the well-documented importance of particular places and landscapes to the continuity of aboriginal knowledge transmission (Basso (1996), Berkes (1999), Palmer (2005).

C1.8.4 Sensitive Receptors

Consistent with good EA practice (Vanclay 2003), this assessment is designed to be conservative and is based on the most sensitive receptors or most vulnerable users. In the case of the Project, and in relation to the characterization of residual effects on Ktunaxa title rights and interests, this is understood to be those Ktunaxa citizens or families most closely associated with Mi¢qaqas ʔamakis (Land of the Chickadee) and the LSA.

C1.8.5 Significance Threshold

In regard to Ktunaxa Nation title, rights and interests in relation to the Project, a significant effect is considered to be an effect (positive or adverse) that is attributable to the Project or the Project in combination with other changes (including effects of other projects or human activities), and that is likely to result in:

- Strong concern or interest by Ktunaxa Nation citizens; and,
- Clearly discernible (measurable or perceivable) changes to the preferred exercise of a culturally important practice, land use or right.[33]

Significant effects are generally related to a change in the availability or quality of, or access to, resources (tangible or intangible) important to Ktunaxa knowledge, use or rights practice. Significance evaluation assumes the most sensitive user or receptor (Ktunaxa family or sub-group), is based on post-mitigation residual effect, and may differ when considered at various spatial or social scales (for example, individual, family or community).

C1.8.6 Confidence in Predictions

Confidence in predictions provides the level of certainty that the effects of the Project will occur at the level predicted (Hegmann et al. 1999). For the purpose of this report, confidence in predictions is assigned based on the following three categories:

- **Low** — Based on professional judgment with limited available secondary or primary information;
- **Medium** — Based on professional judgment and primary information that is limited due to extent of primary research or level of community representativeness among research participants; and
- **High** — Based on professional judgment, strong primary information (including mapping at 1:50,000 or better) conducted with a reliable sample or operational-level studies involving field visits with knowledge holders, strong project information, and secondary literature review.

C1.9 Summary of Anticipated Project Effects

Anticipated Project effects for all components flow from the anticipated effects of the Project on the flow of the Columbia River, especially downstream of the Project, and their combination with already existing and serious impacts on the Mid Columbia River from existing BC Hydro projects. Project effects on water, and associated Ktunaxa valued components, are summarized below. BC Hydro's baseline understanding of

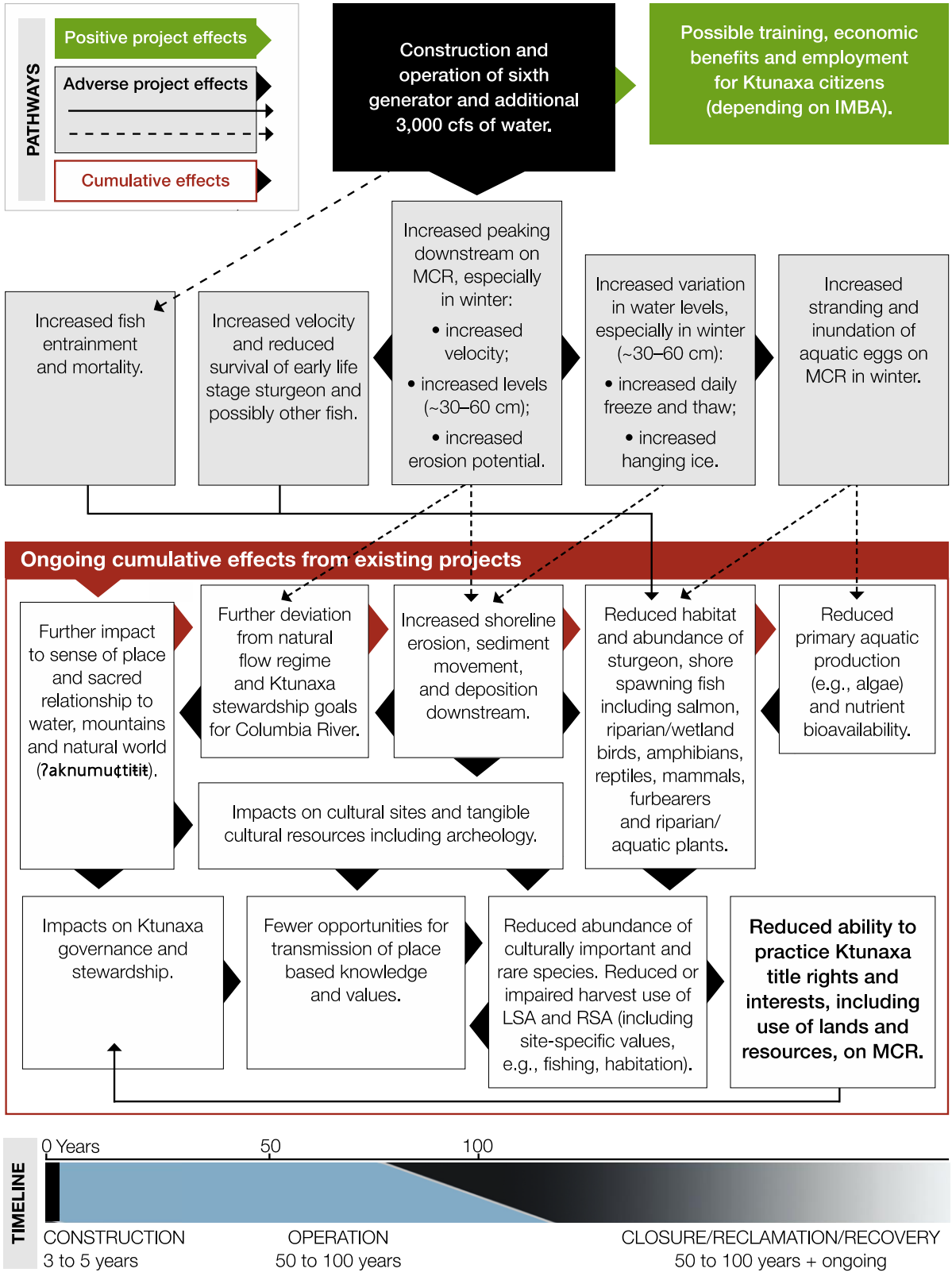
[33] This definition is similar to qualitative thresholds used in other environmental assessments, and is consistent with good practice described in the Canadian Environmental Assessment Agency's *Cumulative Impact Assessment Practitioner's Guide* (Hegmann et al. 1999).

the anticipated hydrologic and erosional effects of the Project are largely based on multiple levels of modeling described more fully in section B4 (Hydrology and Fluvial Geomorphology). While KNC has technical concerns regarding foundational assumptions in the models, including elevation of important riparian areas, as well as the potential for compounded errors between multiple levels of modeling, this work provides the best available overall indication of anticipated effects. In spite of model limitations and the cumulative effect of Arrow Lake Reservoir levels on the indicators, review of Section B baselines indicate that Project effects (in addition to existing effects) on water are anticipated to include:

> *For the steady flow analyses under the Rev 6 peak discharge condition in the ALR El. 425.0 m compared to Rev 5 peak discharges:*
>
> 1. *the water depth in the MCR is between 0.35 and 0.60m greater;*
> 2. *the water velocity in the reach is typically about 0.15 m/s to 0.30 m/s greater; and*
> 3. *the shear stresses are typically between 1N/m2 greater. (Executive Summary, TELEMAC Model Development and Hydraulic Assessment Report, BC Hydro).*

Increases in daily peaking and ramping are anticipated to occur especially in winter when the ALR is generally low and BC Hydro will be most likely to call on the capacity of the 6th generating unit. At an ALR level of 425.0m (the lowest modeled) the Project is anticipated, at peak levels, to result in a 10.8% increase of the maximum wetted area from base case (Section B4.1.1.12.3, p. 65). This wetted area would only exist briefly during the highest need for power, and then would drop, with the cycle repeated on a daily basis when power is needed. Increased peaking flows would expose the incrementally wetted area to frequent freeze-thaw cycles, further increasing erosion, and increasing risk of nest and egg stranding in shore-spawning habitat, including currently vacant salmon habitat. Erosional effects will impact both aquatic and riparian habitat, as well as subsurface archaeological and cultural resources, and would impair potential for restoration and stabilization of ecosystems currently affected by existing operations. Based on Ktunaxa experience with similar projects and impacts, and site visits to the areas affected, the Ktunaxa Nation Council anticipates that without substantial mitigation and accommodation of Ktunaxa rights and interests, Project effects on the Mid Columbia River will include reduced opportunities for harvesting and practice of related Ktunaxa use values, impacts on Ktunaxa stewardship, intangible cultural resources including sense of place, and transmission of knowledge and language, and will result in an intensification of existing impediments to the practice of Ktunaxa title and rights in the Mid Columbia River and extending downstream into the Arrow Lakes. There is some potential for Project benefits in the form of jobs, training and economic opportunities, but these depend largely on the negotiation of an Impact Management and Benefit Agreement (IMBA) or similar document. Without efforts to mitigate Project effects and maximize potential benefits for Ktunaxa communities and citizens, the Project is anticipated to continue existing impact equity trends and continue or worsen disparities between Aboriginal and non-Aboriginal communities in the region. Figure C1-4 provides a summary of anticipated effect pathways described more fully in later sections.

Figure C1-4 Anticipated Project and Cumulative Impact Pathways



C2 KTUNAXA TITLE AND RIGHTS: NAPITUK (WATER)

C2.1 Introduction

Ktunaxa language, oral history and worldview recognize the lands and waters of Ktunaxa ʔamakʔis as alive, evolving, and the home of powerful forces who's travels, battles, and lives have left, and continue to leave marks and remains across a Ktunaxa cultural land-and-water scape. These include cultural laws, rights and responsibilities that are currently held by Ktunaxa citizens and that will be passed on to future Ktunaxa generations. The community of yaqan nuʔkiy notes on their website that the waterways, "formed the existence and link to all the communities of the Ktunaxa Nation confirmed by the Ktunaxa creation story" (Lower Kootenay Band 2016). From a Ktunaxa perspective, a fundamental underlying concept – explicitly and implicitly encoded in Ktunaxa language and Ktunaxa law – is that water itself is a living thing and must be respected as such. While the Ktunaxa Nation Council, together with its member communities, assert title to lands and waters within Ktunaxa ʔamakʔis, the Ktunaxa relationship to water goes far beyond it being relied upon for the practice of rights or title. Napituk is understood to be a sacred foundation for all living things, and ʔaknumuɬtitit (Ktunaxa law) requires the Ktunaxa Nation and Ktunaxa citizens to protect, take care of, and steward the natural quality and flow of water within Ktunaxa ʔamakʔis for the benefit of all living things and for future Ktunaxa generations.

Napituk is fundamental to the Ktunaxa creation story, and as an essential part of ʔa·kxaṁis q̓api qapsin (all living things), it is considered sacred under Ktunaxa law. In the words of one knowledge holder:

> *Well the water is life. You take care of it; it'll take care of you. Leave it as it is. We cannot improve it. We didn't put it there ourselves, it was put there for us, to look after, not to try and improve it because we didn't, we don't know how to because we're not the ones that created it so we don't know anything about it. (Williams, Leo video in Water and the Circle of Life. Ktunaxa Kinbasket Treaty Council, 2004)*

Napituk (general term for water) or wu'u (water for drinking) is respected and treated as sacred and central to life within Ktunaxa tradition and worldview. A quick search for "water" in the Ktunaxa Language portal at www.firstvoices.com results in 46 different Ktunaxa terms for water, and the ways water is used. Examples of these terms include: ¢aqananmituk (water flowing), ʔisnuxuʔnuk (swiftly flowing water), ʔa·kikq̓anak (still water), ¢umuk (water to bubble up out of the ground), k̓utmik (hot water), k̓isqatuk (cold water), haɬinkikqa (transport across water) among many others (First Voices 2016). It is suggested that there may be as many as 80 terms for water depending on the context that it is used for (Ray Warden, pers. comm., November 22, 2016).

Specific to the Project, another Ktunaxa knowledge holder visiting the Mid Columbia River highlighted water as one of the most important things to focus on:

> *I'll say something about the water. You look at this land and you look at the fluctuation of the dam, of what it's doing…What about our fish? What about our fish habitat? Our soils? I'm just thinking of the*

> *spawning areas …And it's sad because when it [the dam] effects the fish, what eats the fish? It's not just humans that eat fish, it's not just [us], where's the bears? And somebody was talking about the impacts? We were just up there [near Burton] and it's august and the eagles are coming. The eagles, what's gonna happen if we do put in more [generators], put more in, it's going to effect our fish and our birds, the wildlife, and the plants. And nobody's even fixing it, they're just ruining it and we've always been told not to ruin anything. I try to keep an open mind. If you're going to do something, do what you gotta do, but make sure you fix it, make sure it's always comes back better than the way you left it. That's what we were taught in school. So what makes it okay to do this to our land? (A04, August 18, 2016)*

Within the Ktunaxa worldview, the movement of water underground is one aspect of the active presence of lands and waters in Ktunaxa lives. Natural fluvial, geological and terrain features of Mi¢ʔqaqas ʔamakʔis provide a connection to ongoing creation, and are often associated with special meaning and cultural importance within the context of Ktunaxa knowledge and especially Ktunaxa creation stories. Ktunaxa knowledge holders recognize the importance of ground water for maintaining ecosystems and include this within Ktunaxa stewardship responsibilities related to water.

As discussed in section C1, the Ktunaxa Nation is the ultimate steward of land and water within Ktunaxa ʔamakʔis. With regard to water, this requires maintaining and restoring natural flow within water systems, as well as maintaining (and where necessary, restoring) water quality conditions and hydrological function, riparian ecosystems, and habitat for fish and other water dependent species. In particular as identified through the KNC Baldy Ridge Environmental Assessment Process, Ktunaxa water stewardship goals include:

- rigorously protecting ecologically and hydrologically effective riparian zones;
- protecting groundwater from quantitative and qualitative perspectives;
- protecting aquatic and riparian ecosystem functions and processes to support diverse native plant and animal communities;
- protecting the hydrological functioning of uplands, wetlands and floodplains;
- opposing the disposal of any wastes in water in general, and specifically prohibiting any waste discharges that impair its ecological functions, cultural value or value for human, plant and animal use;
- prohibiting other water uses that disturb natural stream processes and functioning;
- encouraging active watershed stewardship by Ktunaxa citizens, non-Ktunaxa neighbours and basin residents (including industrial water withdrawal); and
- protecting, maintaining and restoring all fish communities including culturally significant, regionally important or rare, threatened and endangered fish species.

C2.1.1 Water as a Valued Component and Ktunaxa Threshold of Significant Effects

Because of its fundamental importance and centrality to the Project, and for the purpose of this section C assessment, the natural flow and quality of water is taken as a Ktunaxa valued component that spans all of the Nation Council pillars and governing sectors. Water as a valued component is tied to the health of biodiversity, riparian and wetland habitats, fish and aquatic systems, but these are addressed as a part of the Ktunaxa lands and resources assessment. Based on the critical and sacred importance of water itself

– and deviations from natural or unregulated flow – to Ktunaxa citizens, Ktunaxa Nation representatives made multiple requests through the pre-application period for BC Hydro to include water, including hydrologic function and quality, as a full Valued Component in the Section B assessments[1]. This was first requested in Valued Component meetings in 2014 and then repeatedly requested at meetings throughout the BC Hydro Core process. These requests culminated in a formal written submission and request to BC Hydro and the CORE process to fully include water as a valued component, including cumulative effects assessment for impacts to water, and all associated valued components, in fall 2016 (KNC technical memorandum dated Oct. 1, 2016[2]). Despite baseline information and modeling showing clear Project effects on water, BC Hydro chose not to accommodate this request and instead included water and hydrologic function only as intermediary components that are not assessed in their own right in Section B. Because BC Hydro chose not to include water as a valued component, this section relies on baseline and modeling completed by BC Hydro and considers this information from the Ktunaxa perspective, based on Ktunaxa understandings of acceptable thresholds of change in the Revelstoke area and on the Mid Columbia River.

In establishing Ktunaxa thresholds for significant effects on water, we begin with the understanding that, at a minimum, all current and future Ktunaxa citizens have the right to access water in sufficient quantity and quality, in preferred locations, to maintain the continuity of Ktunaxa practice, including sacred relationships to water, throughout Ktunaxa lands and across generations. Along with use rights, Ktunaxa have a right to maintain governance and stewardship obligations related to water according to the Ktunaxa law, ʔaknumuɬtitit (see C1.7). From a Ktunaxa perspective, once connectivity or function within water systems is impaired (either physically, chemically or biologically), impacts within the water system accumulate for ʔa·kxaṁis q̓api qapsin (all living things). Over time, the accumulation may lead to critical impacts on Ktunaxa stewardship responsibilities (ʔaknumuɬtitit) and compromise the transmission of knowledge and practices reliant on or related to water for future Ktunaxa generations (see Section C3 and C8).

The Ktunaxa Nation understands the maintenance of ʔa·kxaṁis q̓api qapsin to mean maintaining the health, quantity, and variability of all living things within Ktunaxa lands and waters at levels equivalent[3] to pre-1900 conditions. Maintaining ʔa·kxaṁis q̓api qapsin requires the protection or re-establishment of ground and surface water flows, hydrologic function, and water quality, such that individual animals[4], populations, species, communities and habitats, including ecosystem structure and processes are maintained or restored. While the Ktunaxa Nation recognizes that lands and waters are alive, and therefore evolving, they believe that no human actions should change the presence, range, movement,

[1] Numerous other past environmental assessments in the BC and federal process include water flow (e.g. hydrologic function) and water quality as important valued components receiving full characterization and assessment against thresholds of acceptable change.

[2] Presented at CORE meetings, October 4 and 5th in Revelstoke, BC.

[3] Equivalence may be maintained in the presence of impact or human action through acceptable offsetting including protection or restoration of equivalent habitat, or managing water, fire, or other influences in order to mimic pre-disturbance ecological processes.

[4] Protection of individual animals, fish, plants, is of particular importance where species or resources are rare, endangered, or hard to find within Ktunaxa territories, and especially where populations are not sufficient to sustain a rights-based threshold of Ktunaxa harvest by current or future Ktunaxa citizens.

or distribution of water, plants, animals or other resources, in ways that threaten the future practice of Ktunaxa culture and way of life, including Ktunaxa title and rights.

Based on this Ktunaxa perspective, and for the purpose of this assessment, the Ktunaxa threshold for significant project effects on water is understood to be:

> measurable or perceivable effects attributable to the Project, or to the Project in combination with past, present, or foreseeable future impacts from other projects or the environment (e.g. climate change), that either support or detract from Ktunaxa water planning goals to re-establish a pre-disturbance or equivalent flow regime on the Columbia River sufficient to maintain the integrity of ʔa·kxaṁis q̓api qapsin, and to sustain the future practice of Ktunaxa language, title, rights and culture by present and future Ktunaxa citizens on the Arrow Lakes and the Mid Columbia river.

Because of the importance of past industrial impacts on the flow of the Columbia River, any residual adverse Project effect on water that would further deviate from the pre-industrial presence, range, movement, and seasonal distribution of water on the Columbia River, would likely be significant, especially where they may be contrary to Ktunaxa stewardship goals or threaten the ability of future generations to practice aspects of Ktunaxa culture and way of life, including title and rights, knowledge and language, economy, employment, or social well-being.

C2.1.2 Water and Interconnections with Other Ktunaxa Valued Components

As noted above, water is of such critical importance to Ktunaxa citizens that it is treated as an overarching value which impacts all other aspects of the Ktunaxa assessment, including valued components associated with traditional knowledge and language, economic, social, employment and lands and resources. The importance of water for each of the five sectors of Ktunaxa governance is addressed briefly below. Potential impacts from the proposed Project on surface water hydrology are included as an impact pathway within each of the sector assessments in this Section.

Traditional Language and Knowledge Sector

Water is fundamental to the Ktunaxa creation story, and is understood by Ktunaxa knowledge holders to be the basis for all living things within Ktunaxa ʔamakʔis. Rivers, streams, lakes, wetlands and riparian areas provide essential habitat for fish, and for many of the animals and plants that Ktunaxa harvesters rely on. Responsible stewardship of water is a critical component of Ktunaxa responsibility to living things. Ktunaxa water transportation routes, trails, harvesting areas, and cultural use areas are often oriented along streams, rivers and lakes within Ktunaxa ʔamakʔis and access to clean water is essential to the ability of Ktunaxa citizens to spend time on the land, especially when travelling or hunting for extended periods in remote areas. Travel by boat is fundamental to Ktunaxa access during ice-free conditions. Travel along ice covered streams and waterways by foot, vehicle, or snow machine is fundamental to winter access, especially for ice fishing, winter hunting, and trapping of winter fur. Water bodies, including the Arrow Lakes and Columbia River, are traditional and current travel corridors and cultural water-and-landscapes that are fundamental to the transmission of place-specific knowledge between Ktunaxa generations in Mi¢q̓aqas ʔamakʔis. Changes in the hydrology of the upper and Mid Columbia River and Arrow Lakes caused by past hydroelectric dam construction and ongoing dam operation, including the Revelstoke Dam, have inundated many critical cultural areas and resources

within Mi¢ˀqaqas ʔamakʔis and created substantial barriers and impediments to ongoing Ktunaxa transmission of knowledge and language in the area. Change in the natural flow regime and fluctuations in dam-controlled water levels south and north of the Revelstoke Dam are impacting Ktunaxa's use and access to important cultural areas related to Ktunaxa oral history and relationship with the Arrow Lakes and Mid Columbia River. See C3 for more information.

Economic Investment Sector

Water, including quality and quantity, as well as the fish, wildlife, and plant resources it sustains, are fundamental economic assets and renewable resources relied upon by Ktunaxa communities. Where water quality or quantity are degraded or impacted, or where water use is monopolized to the exclusion of Ktunaxa values, it can become a fundamental economic constraint for Ktunaxa citizens, especially where water limits ecological health, or the ability to develop economic resources. The potential for some alternative Ktunaxa economic futures, such as sturgeon fishing based tourism and guiding, depend heavily on confidence in the quality and quantity of flow, including management of timing, on the Arrow Lakes, Upper and Mid Columbia River and its tributaries. Water and its use for electrical generation by BC Hydro currently excludes meaningful economic participation by the Ktunaxa Nation and fails to recognize Ktunaxa title, alongside its neighbors, on the Mid Columbia River. Simultaneously, control of the resource by BC Hydro eliminates the ability of the Ktunaxa Nation to realize and benefit from the natural economic potential of its lands and water. See C4 for more information.

Social Sector and Training and Employment Sector

Clean water is a fundamental determinant of human health. It is essential to Ktunaxa confidence in wild foods, and to the place of wild foods, and especially fish, at family dinner tables. Regulation of water levels impacts the ability of Ktunaxa citizens to rely on the Arrow Lakes and Mid Columbia River while providing little or no social, training, or employment benefit and thereby further exacerbating job and training equity issues between Ktunaxa and non-Ktunaxa communities. Ktunaxa citizens perceive increased health risk in industrially regulated reservoirs, including risks from increased mercury, and specific cultural risks associated with the flooding of Ktunaxa burial sites (see subsection C 5 and 6 for more information).

Lands and Resources Sector

The waters of Ktunaxa ʔamakʔis are crucial to ʔa·kxaṁis ḳapi qapsin (all living things). Any Project effects on water are anticipated to have linkages to the lands and resources of Ktunaxa ʔamakʔis especially fish and fish habitat (including sturgeon and salmon), aquatic plants, as well as wetland and riparian plants and habitat, and species such as ungulates, migratory birds and furbearers that rely upon them. Increased erosion, and changes in ice production and freeze-thaw cycling, are anticipated to result in impacts to aquatic and riparian habitat due to Project increases in water level and velocity, especially in winter. It is understood that historical developments in the Columbia River system have contributed to a severely impacted baseline for values within the lands and resources sector of Ktunaxa governance. Prior to the development of dams, Ktunaxa relied heavily on water or lake dependent resources in the Mid Columbia and Arrow Lakes region. These included reliance on fish (e.g., ocean-going salmon, kokanee, trout, sturgeon and burbot); ungulates including caribou; and a variety of plants and berries. See C7 for a more detailed description of Ktunaxa rights and interests related to water, lands and resources.

C2.2 Baseline

The Ktunaxa baseline understanding for water in relation to the Project considers current conditions in relation to conditions prior to BC Hydro regulation. Baseline information from BC Hydro provided in section B is considered from a Ktunaxa perspective.

C2.2.1 Spatial Boundaries

See section B4.1.1 (Hydrology and Fluvial geomorphology) for a discussion of spatial boundaries for water. For the purpose of Section C2, we use study area boundaries similar to those considered in other Ktunaxa sections. The local study area (LSA) comprises the Mid Columbia River (MCR), where direct downstream Project effects are anticipated to be measurable or perceivable. The Regional Study Area (RSA) is intended to include areas where indirect effects may occur and to provide regional context for the assessment of project-related effects.

Spatial Extent	Definition
Local Study Area (LSA)	Mid-Columbia River (MCR) which is the Columbia River downstream of Revelstoke Dam and Generating Station to Arrowhead (at the head of the Upper Arrow Lake) as well as portions of upper Arrow Lake extending to the 'narrows' downstream of Burton, BC.
Regional Study Area (RSA)	Columbia River and Arrow Lakes within Miɬʔqaqas ʔamakʔis.

C2.2.2 Temporal Boundaries:

The assessment includes construction and operations associated with the Revelstoke 6 generating station, as well as an anticipated, but undefined closure and restoration period. The Ktunaxa Nation does not anticipate any infrastructure that impacts Ktunaxa ʔamakʔis to be permanent and maintains that BC Hydro must plan, anticipate, and budget for its eventual safe closure and decommissioning, removal and restoration.

Similar to other human-made structures such as roads and bridges, dams have finite lifespans and require maintenance. Although the lifespan of dams range according to the adequacy of the maintenance regime, there is extensive evidence of large dam deterioration due to seismic activity, chemical expansion, siltation and water erosion over time (World Commission on Dams, 2000). While Section B does not anticipate a closure period, Ktunaxa knowledge holders were very clear in their expectation that even if the project is able to continue to function for up to or more than 100 years, it will remain BC Hydro's responsibility to ultimately remove its infrastructure, restore the Columbia River to an unregulated flow regime, and make best efforts to achieve clear Ktunaxa objectives for management of the region including return of healthy anadromous salmon movement, and healthy populations of sturgeon. The

Ktunaxa role as stewards of the land continues in perpetuity and requires consideration of the water rights of future generations (as described by Ktunaxa knowledge holders, field visit, 2016). As such, the Ktunaxa Nation expects that once the Revelstoke Dam ages, the Project will be decommissioned.

For the purpose of assessing Ktunaxa title, rights and interests related to water, we have assumed that construction will occur over a three to five-year period, operation will last up to 100 years, and will be followed by a long term decommissioning and restoration period.

C2.2.3 Summary of Information Sources for Baseline

Baseline information sources for this assessment include:

- Project Description;
- Draft hydrological model results including TELEMAC modeling provided by BC Hydro;
- Field tour with Ktunaxa knowledge holders in August 2016;
- Recorded interviews with Ktunaxa knowledge holders in 2015 and 2016;
- Fish and Fish Habitat Baseline (section B.4.2);
- Water Use Plan study CLBMON-3 Kinbasket and Revelstoke Reservoirs Ecological Productivity Monitoring (Bray 2011); and
- Published and unpublished literature as cited below in references.

C2.2.4 Pre-Development Baseline

Prior to regulation, the area that is now the Revelstoke Reservoir (RR)[5] was dominated by a fast flowing Columbia River draining a wide area of mountainous terrain and characterized by low winter flows and an intense spring freshet, as snow melt seasonally flushed the system with nutrients and moved sediment and debris on a seasonal basis. The river was home to rich anadromous salmon runs and the Arrow Lakes sustained a large population of white sturgeon. Along the river were upland forests and floodplains, including important ungulate range utilized by healthy populations of deer and mountain caribou, as well as wetlands, gravel bars, and a riverine system which extended down to upper Arrow Lake (Utzig & Schmidt, 2011). See Sub-section C7 Lands and Resources for a detailed description of ecosystems and landforms that existed prior to the construction of the dam. Also see sub-section C3 Traditional Knowledge and Language for a detailed description of the rich Ktunaxa cultural practices in the area prior to development.

C2.2.5 Current Conditions

As discussed in section 4.1.1.2, the headwaters of the Columbia River begin at Columbia Lake, then flow northwest before emptying into Kinbasket Reservoir where the river is currently impounded behind the Mica Dam. The Columbia River then flows south into the Revelstoke Reservoir where the river is

[5] The acronym RR is used interchangeably throughout all sections of this Section C document to refer to Revelstoke Reservoir or Revelstoke Reach.

currently impounded again, and large areas inundated, by the Revelstoke Dam. Below the Revelstoke Dam, the Columbia River then flows into the Arrow Lakes Reservoir which is again impounded and inundated by the Hugh Keenleyside Dam. South of the Keenleyside Dam, the Columbia River enters the United States. Because of the complex interactions between reservoirs, incremental effects corresponding with the addition of a sixth unit on the Revelstoke Dam will occur within the context of, and in addition to, complex interactions and fluctuations occurring downstream on the Arrow Lake Reservoir as a result of Keenleyside Dam regulation. Anadromous salmon have been blocked from passage beyond the Grand Coulee dam since its construction between 1933 and 1942. Regulation by BC Hydro has resulted in flooding of much of the Columbia River valley, and changes to the seasonal hydrograph below the Revelstoke Dam that see much higher peaking flows in winter and much lower flows during the spring freshet.

Based on impact trends since the early 20th century, and considering the pre-development context, current impacts on water in the Revelstoke Reach and the Mid Columbia River are understood by Ktunaxa knowledge holders to have already passed a threshold of significant effects to cultural rights, title, and interests, as a result of current and past hydro-electric activities. Shorelines areas lack the kind of biodiversity experienced by Ktunaxa knowledge holders in less impacted systems, keystone species (e.g. salmon, caribou, and sturgeon) are rare or missing from the ecosystem, river channels are unpredictable, and banks are unstable and heavily eroded, making access and transportation difficult. As such, anthropogenic changes to water quality, levels and flows are of critical concern and any incremental adverse and residual Project-related effects would also be considered significant. Multiple Ktunaxa participants in the Revelstoke 6 Use and Interests Study interviews (2015 and 2016) raised water quality and flow or quantity impacts, including impacts to fish and aquatic life, as important concerns that influence Ktunaxa use of the Mid Columbia. For at least some Ktunaxa citizens, confidence in water flows and water quality remain a barrier to ongoing Ktunaxa use of lands and resources[6].

As noted in section B, the elevation of Arrow Reservoir inundation has a profound effect on the remaining riverine ecosystems of the Mid Columbia River. Often in the summer the area can be back flooded up to the confluence with the Illecillewaet River. In some years the river can be back-flooded right up to the base of the dam. The impacts of the Project will occur within the context of, and in combination with, wider impacts from other BC Hydro facilities. Project impacts will be most visible and intense when the Arrow Reservoir level is low, especially in late summer, fall and winter, but even when the Arrow Reservoir is high, increased water levels and velocities will influence shoreline and bed erosion and formation, as well as hanging ice production in wetted areas along the MCR.

C2.3 Anticipated Project Effects on Water

As noted in C1, BC Hydro's baseline understanding of the anticipated hydrologic and erosional effects of the Project are largely a result of multiple levels of modeling. These are described more fully in section B4.1.1 (Hydrology and Fluvial Geomorphology). While KNC has technical concerns regarding foundational assumptions in the models, including elevation of important riparian areas, inclusion of ice

[6] See TKL Section C3 for more on the historical loss of cultural rights and interests in the RSA

dynamics and increased freeze-thaw cycling (FTC), as well as the potential for compounded errors between multiple levels of modeling, this work provides a useful overall indication of anticipated effects. In spite of model limitations and the cumulative effect of Arrow Lake Reservoir levels on the indicators, review of Section B baselines indicate that Project effects (in addition to existing effects) on water quantity and timing of flow are clear and anticipated to include:

> For the steady flow analyses under the Rev 6 peak discharge condition in the ALR El. 425.0 m compared to Rev 5 peak discharges:

1. the water depth in the MCR is between 0.35 and 0.60 m greater;
2. the water velocity in the reach is typically about 0.15 m/s to 0.30 m/s greater; and
3. the shear stresses are typically between 1 N/m^2 and 5 N/ m^2 greater. (Northwest Hydraulic Consultants 2015 p.iii).

Increases in daily peaking and ramping are anticipated to occur especially in winter when the ALR is generally low and BC Hydro will be most likely to call on the capacity of the sixth generator. At an ALR level of 425.0m (the lowest modeled) the Project is anticipated to result in a 10.8% increase of the maximum wetted area from base case, at peak levels (Section B4.1.1.12.3, p. 65). This wetted area would only exist briefly during the highest need for power, and then would drop, with the cycle repeated on a daily basis. Increased peaking flows would expose the incremental wetted area to frequent freeze-thaw cycles, would increase erosion, likely reduce aquatic and terrestrial productivity (impacted area unlikely to contribute to either) and would increase hanging ice production and would impact aquatic and riparian nest and egg habitat, as well as primary production, as a result of stranding. While likely less frequent and of lower magnitude, increased variation and erosional impacts are also anticipated as a result of Project related fluctuations on Revelstoke Reservoir.

Flow velocity downstream of the dam is also anticipated to increase as a result of the Project. As noted in section B4.1.1:

> *Under the Project case peak discharge condition, the reach-averaged velocity in Reach 2 is typically about 0.15 m/s to 0.17 m/s greater than the velocity under the Base case maximum discharge condition at different ALR elevations. Reach 4 and Reach 3 average velocities increased by 9.5 to 15 percent from the Base case to the Project case under the high ALR stage condition.*

Impacts of increased discharge will result in higher fish entrainment mortality above the dam, and increase risk of early life stage fish mortality, including for white sturgeon, below. Sediment movement and increased erosion would be increased as a result of increased shear stress and weakened shear strength of shoreline soils resulted from repeated FTC in combination with higher water levels and velocities. In most of the MCR this will mean increased rate and speed of movement of sediments. In some portions of the MCR it will mean movement of larger sediment particles. Increased scouring and lateral erosion will have impacts on a range of Ktunaxa values including riparian, wetland and aquatic habitats, archaeology, and both tangible and intangible cultural values associated with practice of Ktunaxa title and rights.

A key barrier to consideration of water as a valued component in this section the absence of information on how water – as ice – will interact with Project effect to result in increased erosion and impacts to other important Ktunaxa valued components including archaeology, cultural use, fish, bird and animal habitat,

and impacts to riparian ecosystems. While BC Hydro has modelled anticipate fluvial erosion (see B.4.1: hydrology and fluvial geomorphology), it is unclear how, or if, modelling anticipates the importance of ice and freeze-thaw cycling. Some section B materials (B4.6 Birds and B4.5 Herptiles) recognize the ecological importance of ice for breeding success and survival, but they do not mention increased ice production or freeze-thaw cycling as an impact pathway.

As raised by the KNC and others to BC Hydro through the pre-application period, ice regularly occurs in the MCR in winter and has major implications for the assessment and the health of lands and waters. The rate of erosion along the banks of the MCR was a major concern identified by Ktunaxa knowledge holders in 2016 and Ktunaxa experience indicates that reservoir peaking, especially in winter, has a major effect on ice production and shoreline erosion. Based on BC Hydro's baselines, the Project will result in an up to .6m increase in hydropeaking on the MCR, especially in winter. If frozen soils are flooded by warm water, any insulating snow cover will be removed, soils will thaw quickly and become saturated. If water levels then drop, the soils will be stranded and freeze quickly. The water in them will turn to ice, expand and destabilizes the soil. When the frozen soils are flooded again by warm water (as during hydropeaking), they will again thaw, and in their destabilized state, erode much more easily with the increased water velocity, water levels and shear stress. Soils that do not erode will be saturated again and the cycle will repeat.

Work by the US Army Corps of engineers (Gatto 1995[7]) indicates that increases in FTC and other ice related impacts can result in exponential increases in erosion along reservoir banks and shorelines, especially in Spring or when previously frozen soils melt. Gatto provides a broad overview of literature that indicates the importance of frost, freezing and effects of FTC on erosion through reducing soil shear strength. He cites work in other reservoirs subject to seasonal freezing where up to 90% of soil erosion is attributable to frost and freezing rather than the simple movement of fluid water alone:

> Soil freeze-thaw cycles (FTC) usually change soil structure, water content and bulk density, and degree of grain interlocking, thereby reducing soil strength, at least temporarily... Reid (1984,1985) reports that thaw failures resulting from a loss of soil strength when frozen soils thawed constituted up to nearly 90% of the total sediment lost from banks along Orwell Reservoir in Minnesota. (Gatto 1995: 4)

While the erosional features up and downstream of Revelstoke are unique, Gatto's review is directly applicable to modelling of erosion rates on the MCR:

> To be of any value in northern climes, methods to predict annual bank erosion must adequately account for the seasonal variations in soil strength due to soil freezing and thawing processes. (Gatto 1995: 15).

Where natural or pre-Project seasonal variation may see a destabilizing freeze-thaw cycle occurring a few times a year within the incremental inundation zone, Project hydro-peaking in winter would see dozens of additional *daily* freeze-thaw cycles within the incremental inundation zone – likely resulting in destabilization of banks and causing erosion in ways not accounted for by considering higher flow levels, velocity, and fluvial shear stress alone. As Gatto's executive summary indicates:

[7] Available at: http://www.dtic.mil/dtic/tr/fulltext/u2/a301818.pdf

> previously frozen soil temporarily has an excess of soil water and a disrupted soil structure, which significantly reduces internal friction and cohesion and reduces the soil's shear strength, in this weakened state, thawed bank soils are usually more easily eroded by raindrop impacts, overland flows, river and lake ice forces, currents and waves, and are highly susceptible to mass failures... frost-induced reductions in soil strength and soil particle displacements must be included in bank migration and bank erosion models to be applied in regions with seasonal soil frost. (Gatto 1995: executive summary).

Without confirmation of reliable information and modelling that includes increased FTC and ice production in combination with fluvial processes in section B – and consideration of resulting assessment implications for other VCs - this section C assessment must take a precautionary approach and assume a much higher rate of bank erosion and migration than is anticipated in BC Hydro's section B material. While likely less frequent and of lower magnitude, increased variation and resulting erosional impacts are also anticipated as a result of Project related fluctuations on Revelstoke Reservoir.

C2.4 Related Proposed Mitigations

Project impacts associated with water, including increased depth and variation, erosional potential, ice production, freeze-thaw cycling, and velocity in the MCR, and to a lesser degree, and less frequently, but over a larger area, within the Revelstoke Reservoir, are anticipated to be unavoidable and not mitigable, should the Project proceed. Some partial mitigation may be achieved through habitat offsetting and other measures described in Section C11.

Table C2.1 Characterization of Residual Project Effects after mitigation on Ktunaxa Rights and Interest related to Napituk

Valued Component	Magnitude	Direction	Geographic Extent	Duration	Frequency	Reversibility	Probability	Context / Confidence
Napituk (water)	low to high, depending on location and ALR level	Negative	LSA (MCR), extending to RR	Permanent (>25 years)	High and seasonal (daily during high demand)	Flow is reversible but erosion effects will be permanent	High	Already past threshold of significant effect

Assuming full and successful implementation of all mitigations and measures recommended in section C.11, the magnitude of the effect of the Project on water is considered to range from low to high based on the location, dependence on ALR levels, the context of existing effect, and importance of water to the culture, title, rights and interests of the Ktunaxa Nation.

The Direction of the Project effect is negative, as the Project will intensify and prolong already existing adverse impacts ongoing within the Columbia basin. The Project would move timing, flow, velocity, inundation level and other factors further away from riverine conditions and seasonal hydrograph that existed prior to regulation.

The Geographic extent of effects will be primarily local as impacts will be experienced primarily within the LSA, though lower magnitude and less frequent effects within the Revelstoke Reservoir (the RSA) will also occur.

The Duration of the Project effect on Ktunaxa title and rights related to water is considered permanent as it will extend longer than one generation (i.e.,25 years). Based on BC Hydro documentation, actual effects would be anticipated to last at least four generations (more than 100 years).

The frequency of Project effects on water will depend on power demand, but are assumed to be daily during seasonal high demand periods, especially in winter, and will occur throughout the operational life of the project.

Adverse effects on water flow would be reversible, but erosional effects would be permanent and potentially severe. The probability of the Project effect on water is high based on project modeling and predictions confirmed in Section B, however our predictions of high magnitude erosional effects as a result of FTC acting in combination with fluvial erosion are based on precautionary assumptions and are made with only moderate confidence. Additional work should be required during the application review period to confirm.

The context for the project effects is a severely impacted Columbia basin region where impacts on the natural flow of the Columbia River have already far exceeded the Ktunaxa threshold for significant effects. Ongoing cultural losses related to elimination of salmon, and harvestable populations of sturgeon and caribou, as well as overall impacts to biodiversity, ecological function, important cultural and spiritual sites, and other impacts (see other sector assessments in Section C) have already seriously impacted Ktunaxa title and rights. The Project would worsen the situation for future Ktunaxa generations.

C2.5 Determination of Significance of Residual Project Effects on Water

Based on available information, including Ktunaxa knowledge and experience with similar projects, residual effects on the Ktunaxa valued component of water are anticipated to be likely and:

- measurable or perceivable (i.e., up to .6 m increase in MCR level, as well as increased velocity, increased FTC, and increased erosion);
- attributable to the Project, and to the Project in combination with past, present, and foreseeable future impacts from other BC Hydro projects and the environment (e.g. climate change);
- harmful to Ktunaxa water planning goals including re-establishment of pre-disturbance or equivalent flow regimes on the Columbia River sufficient to maintain the integrity of ʔa·kxaṁis q̓api qapsin (e.g., ocean migrating salmon, white sturgeon, mountain caribou);

Given the anticipated adverse contribution of the Project to existing impacts to Ktunaxa title, rights and interests related to water, assuming full implementation of mitigations provided in section C11, and in the absence of actions that may provide reliable and full mitigation of relevant effects, the Project is considered likely to result in significant effects on the Ktunaxa valued component of water.

Very substantial compensatory or accommodative measures that deliver long-term benefit to the Ktunaxa Nation may, depending on Ktunaxa agreement, be considered to balance out the anticipated adverse residual Project impacts and result in a reversal of historic trends. In order to be effective:

- ecological effects of the Project on land, water and all living things would need to be mitigated to the extent possible, and the mitigations proven culturally and ecologically effective based on Ktunaxa monitoring;
- additional measures would need to result in a substantial net positive effect on ongoing and future practice of Ktunaxa language, title, rights and culture by present and future Ktunaxa citizens on the Arrow Lakes and the Mid Columbia river;
- This balancing of effects would be dependent on negotiation of an IMBA or similar binding document agreeable to Ktunaxa leadership.

C3 KTUNAXA TITLE AND RIGHTS: TRADITIONAL KNOWLEDGE AND LANGUAGE

The Traditional Knowledge and Language (TKL) Sector is one of the four pillars of Ktunaxa governance and plays a key role in achieving the vision of the Ktunaxa Nation Council:

> *…to achieve strong, healthy Citizens and communities speaking our languages and celebrating who we are and our history in our ancestral homelands, working together managing our lands and resources within a self-sufficient, self-governing Nation. (Ktunaxa Nation AGA 2000).*

As noted in C3.1 and C3.2, Ktunaxa cultural heritage includes both intangible cultural properties, such as values, practices, knowledge, and language itself, and tangible cultural properties, such as places, resources or things. Anticipated effects of the Revelstoke Generating Station Unit 6 Turbine Expansion Project (the Project) on intangible and tangible cultural heritage are discussed below. Recommended mitigations and actions designed to reduce adverse effects and maximize Project benefits for intangible and tangible cultural heritage related to the Ktunaxa TKL Sector are also provided.

C3.1 Intangible Cultural Heritage: Ktunaxa Knowledge and Language Baseline

> *…having been created in interdependence with the land, its living things, and the spirit world, the Ktunaxa possess and are entitled to enjoy our inherent and pre-existing sovereignty over our land and our lives thereon…* (from the Qat'muk Declaration, Ktunaxa Nation Council 2010)

Intangible cultural heritage[1] includes language, knowledge, sacred values, sense of place, intergenerational transmission of knowledge and practices, and other values of importance. The Ktunaxa language is widely recognized as a language isolate, meaning that it does not share a common parent language with other indigenous languages.[2] Language isolates are generally associated with geographies that are mountainous, or that otherwise impede communication, and with continuous occupation of areas over a very long period of time. Within the Ktunaxa language, Upper and Lower Kootenai are typically identified as distinct dialects, separated according to settlement and positioning in relation to the Kootenay River. In 1962, it was estimated that there were 300 to 500 speakers of Kutenai (both Upper and Lower), from Idaho, Montana, and British Columbia (Wallace 1962).[3] In 1990, American census figures for "speakers of American Indian Languages" indicated 102 speakers of the Kutenai language (Broadwell 1995). The 2014 *Report on the Status of B.C. First Nations Languages 2nd Edition* (First Peoples' Heritage, Language and Culture Council (FFHLCC) 2014) estimated that, as of 2014, there were only 25 fluent speakers of Ktunaxa remaining in BC (approximately 2.2 per cent of Ktunaxa citizens in

1 Also see Article 2 of the Convention for the Safeguarding of Intangible Cultural Heritage, UNESCO 2003, accessible at http://www.unesco.org/culture/ich/index.php?lg=en&pg=00006

2 The academic literature on the Ktunaxa language is extensive. Major contributors in the late 19th and early 20th centuries included Chamberlain, Boas and Sapir. More recent linguists publishing on the Ktunaxa language include Paul Garvin, Mary Haas, Larry Morgan and Matthew Dryer.

3 Kutenai is an alternate spelling for the Ktunaxa language, used predominantly in the US.

Canada). The previous 2010 report, FFHLCC classified the language as “critically endangered” and “nearly extinct” (FFHLCC 2010). The survival and revitalization of the Ktunaxa language, and the ongoing learning and use of Ktunaxa by younger generations, is a key priority by the Ktunaxa Nation and is fundamental to the transmission of Ktunaxa knowledge and way of life.

The Ktunaxa Nation understands that, as part of Creation, Ktunaxa citizens were given their language as a method of communicating with each other and with the other non-human beings of the world. It is believed by some that this ability to communicate with nature has deteriorated as the Ktunaxa language changes over time from the original language: “This is why it is very important to recapture the language in its true form as much as possible, so that the integrity of the traditional knowledge contained therein can be protected” (KNC 2005).

As suggested by the Ktunaxa Nation vision discussed in C1, the health and well-being of Ktunaxa individuals, families, and communities is linked to the vitality of Ktunaxa language and culture.

Outcomes associated with this Ktunaxa language vision include:

- Increased recognition and understanding of Ktunaxa traditions and language;
- Increased knowledge and use of Ktunaxa/Aboriginal languages;
- Increased awareness and knowledge of cultural ancestry;
- Strengthened identity as Ktunaxa, and identification with Ktunaxa culture; and
- Strengthened pride in cultural identity (KNC 2010a).

Specific aspirations or measures include the presence of the Ktunaxa language as a functional component of daily life, and that each Ktunaxa citizen have increased knowledge and use of the Ktunaxa language, including having a Ktunaxa name, knowledge of Ktunaxa community names, knowledge of the Ktunaxa Creation story and history, and knowledge of Ktunaxa place names (KNC 2010a).

The funding of language learning opportunities for Ktunaxa citizens, including language learners and experts, is critical to the preservation and revitalization of Ktunaxa language, as is the continued documentation, recording, archiving, and preservation of the living oral language. Continuing documentation of Ktunaxa is a responsibility made critical by the ongoing loss of knowledgeable Ktunaxa elders. In addition to language preservation, the renewal of the Ktunaxa language as a living language (i.e., a language used in everyday communication) within the community is a key objective. This is recognized as a broad challenge that can be accomplished only through a cooperative effort by entire communities (Ktunaxa Nation 2015b).

Within Ktunaxa traditional territory, the maintenance of place-based Ktunaxa language and associated knowledge, including place names, oral histories, land-based narratives, and the transmission of knowledge related to harvesting and practicing rights in the area, is challenged by the accumulation of industrial impacts on Ktunaxa lands and waters. These include both historical impacts and ongoing industrial impacts, including hydro-electric impacts on the Mid Columbia River and Arrow Lakes.

C3.2 Tangible Cultural Resources: Ktunaxa Land, Water and Resource Use Baseline

The Ktunaxa (also referred to in the ethnographic literature as the Kootenaes, Kootenay, Kutenai, Kutonaqa, and Ki'tona'qa) continue to occupy the upper Columbia and Kootenay River valleys, and the Columbia and Rocky Mountains. Ktunaxa communities are often identified as either Upper or Lower Ktunaxa are based on differences in dialect and location along the Kootenay and Columbia Rivers. The Upper Ktunaxa, living at the western edges of the Rocky Mountains and its plateaus, including communities at ʔaqam (St. Mary's, BC), Tobacco Plains, BC, Columbia Lakes, BC, and Elmo, Montana. The Lower Ktunaxa include current communities at Creston BC, and Bonner's Ferry, Idaho, and are more frequently identified as being fisherman, with salmon, sturgeon, and other freshwater resources constituting key components of traditional subsistence and harvesting activities. Despite differences between communities, and between Upper and Lower Ktunaxa, the Ktunaxa as whole share a common, distinct identity and language, as well as cultural and spiritual traditions.

Based on interviews, oral histories, and journals collected and written in the late 19th and early 20th centuries, ethnographers, explorers, and traders (Thompson 1807; Arrowsmith 1814; Ross 1825; Anderson 1867; DeSmet 1846; Chamberlain 1892; Curtis 1911; Boas and Chamberlain 1918; Teit 1928; Turney-High 1941; Schaeffer 1935, 1940) identify the Upper and Mid Columbia River area, including the Arrow Lakes, as being originally and continuously occupied by Ktunaxa speaking people alongside neighbouring groups. Each of these sources supports an understanding that portions of the Project area, and the entire area of Miɬqaqas ʔamakʔis, was used, occupied, and controlled by Ktunaxa speaking people from at least the early 1800s and extending beyond the assertion of British, Canadian or American sovereignty[4] in the region.

C3.2.1 Ktunaxa Use of the Upper and Mid Columbia River Valley and Adjacent Areas

Current and historic Ktunaxa use of the Columbia and Kootenay River Valleys, as well as oral historical and archival information pre-dating 1846, provides insight into the importance of the Project area to the Ktunaxa. Although the alienation of Ktunaxa rights through industrial development, land privatization, increased settlement, and government policy has been substantial, Ktunaxa elders and land users report ongoing use and stewardship of the LSA and surrounding area, including areas in the vicinity of Revelstoke and downstream along the MCR.

Ktunaxa oral histories suggest that Ktunaxa presence in the Upper and Mid Columbia River prior to 1846 included several decades of conflict with other indigenous groups for control and use of places and resources. Oral histories of the Arrow Lakes area include Ktunaxa Creation stories, battles over important spiritual and ceremonial sites, and descriptions of permanent villages and camps, as well as harvesting areas for fishing salmon, kokanee, trout, sturgeon, and burbot, as well as harvesting a rich supply of berries, and hunting abundant caribou:

> *...all the tributaries that come into the [Arrow] lake is where they [Ktunaxa] put their fish - what they call their fish corrals, okay? In the shallow areas. It's where they would put their fish corrals and put the fish weirs in the – in the corrals and that was just to drive the fish into those corrals*

[4] American assertions of sovereignty over much of BC, including the Project area, were not resolved until the Oregon Treaty was signed in 1846.

> *and there was no escape then. Once you're in the corral, right? The only way was to try to swim through the fish weirs, but they would get caught. So this – they would – I don't know how many fish weirs they would have had. I'm sure probably half a dozen or more, they would repeat this till there was enough fish to supply the whole village, and that's how they took care of, you know, fish harvest... we were put here by the Creator and the Creator gave us - gave us ways and means of sustaining ourselves. Surviving on the territory. And that's why it's called the Ktunaxa Territory. (Y04, April 20, 2016)*
>
> *I tell people, I said, "You know what? Ktunaxa had everything in here [on the Arrow Lakes]. We had everything. We had fish. What species you want?" "Well, what's on the menu tonight?" We could have had salmon, we could have had kokanee, we could have had trout, a couple different types of trout...burbot...we had everything. We had elk. We had moose. We had deer. I don't know about caribou… We had everything we needed to survive… You know, who knocked on whose door? Everybody knocked on our door. (Y05, April 16, 2016)*

In addition to Ktunaxa oral histories, early documented accounts of contact with Ktunaxa speaking peoples and prominent Ktunaxa leaders, in the Kootenay and Arrow Lakes regions, including Upper Kootenay, and Lower Kootenay or Flatbow, come from Peter Fidler (1792), David Thompson (1800, 1807), and Joseph Howes (1810). According to Ktunaxa oral histories, the first white traders appeared in the West Kootenays prior to David Thompson's arrival in the early 1800s, and were guided by a Lower Ktunaxa Chief named Uglyhead. At least one of these early Euro-canadian visitors is reported to have been guided by Uglyhead across the mountains from the East Kootenays to the west, and first met the Lower Ktunaxa at the north end of Kootenay Lake, near what is now Argenta. Oral histories regarding these first white traders indicate that at least one of them stayed with the Lower Ktunaxa for six winters. Other details from these early contact histories indicate that hot springs on both the Arrow Lakes (Halcyon) and Kootenay Lake (Ainsworth) were actively used by Ktunaxa people for healing, and that the route to the Arrow Lakes via Trout Lake was well-known and frequently travelled by Ktunaxa-speaking peoples.

Ktunaxa oral histories regarding white traders visiting the west Kootenays and staying for several winters are supported by the archival record. In 1800, David Thompson sent two of his men, LeBlanc and LaGasse (or LeGrâce), from Rocky Mountain House to explore, establish relations, and trade with Ktunaxa groups west of the mountains. They made summer trips to trade furs at Rocky Mountain House, but wintered with the Ktunaxa between 1800 and Thompson's arrival conducting survey work for the North West Company in 1807. Thompson's journals from this period describe Uglyhead as a Ktunaxa chief and a well-respected and prominent leader:

> *... I wished them to conduct me directly as far as the junction of McGillivray's River with the Kootenaes , but they said they had left their Families far on this Side that Place, that the Season was too far advanced, & that not one of them were men of consequence - that Ugly Head, their Chief was the most fit to apply to, as he was best known to the neighbouring Indians & most respected… (September 18, 1807)*

Ktunaxa knowledge holders indicate that at this time, and prior, the Ktunaxa had several regular village locations on the Arrow Lakes, including one high up on the north shore of ¢i¢qum wu'uis, or Waterdipper's Drinking Water[5], what is now known as the Illecillewaet River, near Revelstoke. The area provided a defensible location in case of conflict within neighbouring groups:

> *The reason why our ancestors were all through there is because, for protection...the reason why we're up here, all through here [elevated areas on the north side of the Illecillewaet River] is 'cause we could hear noises…the wind would pick it up, pick up noises. And that would for warn us that that was intruders coming, give us better observation and we could look them over. (Y14, 2016)*

The Illecillawaet River is also reported to have been the dividing line (or what one Ktunaxa elder referred to as the "meeting line") between the Ktunaxa and Okanagan affiliated groups to the west and north:

> *¢i¢qum's water, it goes way...up to Revelstoke...[there was] a pony trail across it… [¢i¢qum's water] goes straight into the mountains, into Rogers Pass...This [Illecillewaet River] is a big river that goes up into the mountains up into Roger Pass...There is a teaching area where the Illecillewaet meets the Columbia, for Ktunaxa rules related to water, related to ¢i¢qum wu'uis ¢i¢qum's water …that the water is there to share. And with a water that, ¢i¢qum's, the shape of the creek bed coming way up this way… in our recording of oral history, it's, it's a bloodline, it's a bloodline of … to give life to the – put it into simplest terms it's an eco-system. And that, we have to respect, we have to respect the water (Y14, 2016)*

Much of the archival record talks about the indigenous peoples of the Arrow Lakes simply as 'Lakes' Indians. As noted by Bouchard and Kennedy (1985, 2001), the ambiguous use of the term 'Lakes' as an ethnic descriptor sometimes leads to confusion over the identities of indigenous peoples using and occupying the Arrow Lakes area prior to and after 1846. The ambiguity of this term also sometimes leads ethnographers—including Bouchard and Kennedy—to understate the complexity of cultural and ethnic relations in this region, despite clear indications that the Arrow Lakes and Mid Columbia River was a meeting place for people of many different cultural and linguistic backgrounds. Ktunaxa histories indicate that, when the first Euro-Canadians began visiting the Ktunaxa of the Columbia River and Arrow Lakes area, Ktunaxa governance systems included strong political, cultural, and military alliances between Ktunaxa families living on Arrow Lakes and Flatbow (or Lower Ktunaxa), and Upper Ktunaxa communities to the south and east. While not conclusive, early cartographic mapping of the Arrow Lake also indicates that very early Euro-Canadian visitors first mapped the Arrow Lakes and surrounding areas, including Slocan Lake, based on Ktunaxa expertise regarding the area. Figure C3-1 shows a portion of Arrowsmith's 1814 map, drawn in England based on HBC documents and one of the very earliest accurate depictions of the Arrow Lakes, including Beaton Arm and Slocan Lake. It shows the Arrow Lakes labeled with a Ktunaxa word, Chath noo nick, or ¢a‡nunik, referring to the people of the Arrow Lakes, especially in the vicinity of present-day Nakusp.

5 Ktunaxa knowledge holders indicated that Waterdipper is a water bird who lives in shallow waters, and a powerful being associated with the ability to foretell the future.

Figure C3-1 Arrow Lakes and the MCR Shown on a Portion of Arrowsmith's 1814 Map, *New Discoveries in the Interior Parts of North America*



Based on available information, as early as 1825, the Arrow Lakes community had a tradition of Ktunaxa leadership, and strong cultural ties to Lower Ktunaxa communities on Kootenay Lake via Trout Lake, and Upper Ktunaxa communities further east. In his 1825 diaries, Alexander Ross, a fur trader passing along the Columbia, encountered a part-Ktunaxa chief leading the 'Sinatcheggs' on Arrow Lake who suggests that there was an influx of Ktunaxa-speaking peoples into the area in the early 1800's[6]:

6 Based on the importance of the Arrow Lakes to the Ktunaxa creation story, it's likely that Ktunaxa connections to the area extend back far beyond the turn of the 19th century.

> *"My father," said he, "was a Kootanais chief, but, in consequence of wars with the Blackfeet, who often visited his lands, he and a part of his people emigrated to this country about thirty years ago. I am now chief of that band, and head of all the Indians here. We number about two hundred, and call ourselves Sinatcheggs, the name of the country; and here we have lived ever since…This part is well stocked with beaver and other kind of furs…The lakes abound with sturgeon and other fish; so that we live well, and are at peace with all men."*

Ktunaxa families living on the MCR and Arrow Lakes travelled regularly between the Arrow Lakes and the north end of Kootenay Lake via the Beaton Arm, Trout Lake and the Lardeau Valley, and from the south end of Arrow Lake down the Columbia and up the Kootenay River. The route from the headwaters of the Columbia, around the Big Bend and along the Columbia River to Arrow Lakes was also regularly used, following the path traced in the Ktunaxa creation story. Ktunaxa knowledge holders report that an overland trail was also used, leaving the Arrow Lakes in the area of Burton or Nakusp, connecting to what is now Slocan Lake and joining Kootenay Lake in the area of Kaslo.

it is clear from 19th and 20th century census records that the indigenous community of the MCR and Arrow Lakes was multilingual and included a Ktunaxa-speaking core. Many archival sources refer to this culturally complex community as 'Lakes' Indians – a term sometimes interpreted as referring only to Colville speaking groups that resided further south along the Columbia River. In the Arrow Lakes area, both Ktunaxa and Salishan languages (including Shuswap and Okanagan-Colville) would have been heard, with the Chinook trade language, English and French becoming more common after the 1830's. Because Ktunaxa is a language isolate, it would have been rare for non-Ktunaxa people to learn Ktunaxa as a second language, but common for Ktunaxa speakers to learn other neighboring languages to facilitate communication and trade. As Silverstein (1996) points out, reiterated later by Palmer (2005: 34-35), indigenous communities in North America should not be assumed to have been typically monolingual.

Prior to the arrival of Catholic missionaries in the West Kootenays (c. 1845), Ktunaxa oral histories indicate that Ktunaxa communities on the MCR and Arrow Lakes were supported militarily by Lower and Upper Ktunaxa Chiefs, including Thomas Blind, Caterpillar (¢aqayit), Kapla (or Capilo) and Star Blanket during a period of extended hostilities with more southern Colville-speaking and Kettle Falls-allied groups (xapkɬinik). Hostilities are reported to have lasted close to fifty years and ended as a result of a final battle fought after the time of Chief Three Moons and just before the arrival of the first priests in the Kootenay Lake area (likely late 1700s to early 1840's). Based on a series of oral histories connected to ¢iɬqum wu'uis (the Illecillewaet River, near Revelstoke), based on a vision, Lower and Upper Ktunaxa Chiefs helped the Ktunaxa of the Columbia River establish an alliance with Salish-speaking groups to the north and west against the Colville and Kettle Falls people. The Colville and Kettle Falls people contested Ktunaxa control of a hot springs that was guarded by the Ktunaxa Xaʔłɬin warrior society. These hot springs were highly valued for their healing properties and later became known in English by a similar sounding Greek word: Halcyon.

> *…[¢iɬqum], he's the one who told the, our ancestors that there's…other Indians are coming, they're going to be your friends. And he was predicting...all the Flatbow's ancestors, Flatbow's connections, they came and helped to fiercely defend the hot springs until that ¢iɬqum, when he said there was going to be a unique Indians going to come and they'll be your friends…" (Y14, 2016)*

Shortly after this treaty and military alliance was forged, a major battle occurred between the Ktunaxa and the Colville-speaking Lakes or Kettle Falls people. The battle is reported to have taken place near the Xaʔłɬ̓in (Halcyon) hot springs. The Ktunaxa and their allies defeated the Colville group and many died in what one Ktunaxa elder referred to as the Ktunaxa version of "Little Big Horn"[7]:

> *…even to this day on a calm night, if you're up there…you can still hear the battle. You can still hear the one on one battles and you can still hear the arrows flying through the air. You can actually still hear it. It's the story coming to life. And in our language that's what it means, it means war cry...When I go up there I still hear that, I still hear, when there's a certain amount of wind, and if you really tune into mother nature, if you really tune into oral history you can still hear the damage whistling through the air, you can still hear and you can still hear the cry, you know, like one on one. You can still sometimes if you really – you can hear, when my ancestors, when we went into battle we used for our armour, we used the cotton wood. And the cottonwood, we would peel the bark off like this and sun-dry it. And when it's dried, it's so light and that was our armor… And you can actually hear that, you can actually hear club hitting the cotton wood. (Y14, 2016)*

The Colville or Kettle Falls group was forced south by the Ktunaxa and their allies to the Columbia River below the Arrow Lakes. Ktunaxa oral histories reference the arrival of the first white priest on the shores of Kootenay Lake following this battle, after which a lasting peace between the groups was established. This suggests that the battle likely occurred no earlier than 1838, and no later than 1846. Ktunaxa oral history indicates that the Ktunaxa and their allies pushed Colville people south of the Kootenay and Pend Oreille Rivers, and while most of the Colville moved south towards the Kettle Falls area, some Colville speaking people later joined Ktunaxa communities.

In addition to oral historical sources, several archival sources support an understanding of conflict between up river 'lakes' communities and Kettle Falls or Colville people in the first half of the 19th century. For example, in a March 1830 report from Dr. John McLoughlin, the Hudson Bay Company's Chief Factor for the Columbia district, to Governor Simpson, a deadly conflict between 'the lakes' and the Kettle Falls (later called Colvile or Colville) is given as rationale for fortification of the newly built Fort Colville. In discussing the allotment of company staff between posts, he notes that Fort Colville had, at that time, 28 men and:

> *[Forts] Colville and Thompson River have more men than was allotted in the scheme, and as to the first [Colville] it is to enable them to erect a new stockade round the buildings as last year a quarrel arose between the Kettle Fall Indians and those of the lakes in which several people were killed and from want of a fort our people were much exposed…(McLoughlin, March 20th, 1830, reprinted in McLoughlin 1948: 95*

Archival documents and cartographic depictions of the Upper and Mid Columbia River further emphasize that the Arrow Lakes area to at least the area of Revelstoke was closely associated with Ktunaxa people

[7] The Battle of the Little Bighorn, commonly referred to as "Custer's Last Stand," was an armed conflict that occurred between combined forces of the Lakota, Northern Cheyenne, and Arapaho tribes and a regiment of the U.S. army in what is now Montana during the Great Sioux War of 1876.

alongside their neighbours. Jesuit missionary Father Pierre DeSmet traveled and worked extensively with the Ktunaxa (who he called Skalzi), and in the Arrow Lakes area in the mid-nineteenth century. His familiarity with the region and the people living there is illustrated in his writings, including *A Vocabulary of the Skalzi or Kootenay language* (1863) as well as other indigenous language guides. A map created by DeSmet just prior to 1846 shows ethnic boundaries in red and clearly shows the Arrow Lakes as being inside the sphere of influence of the Ktunaxa and Flatbow (Lower Kootenay), with the Okanagan to the west and the Chaudiere or Colville to the south (Figure C3-2). Horatio Hale's map, made in 1842 as part of the United States Exploring Expedition, and based on information from HBC traders at Fort Colville, indicates a similar situation (Hale 1842). This is also consistent with information provided by Ktunaxa elders to Turney-High in the 1940's, discussed further below. Different boundaries provided by other authorities may reflect pre-1840 time periods, or may be the result of identifying Ktunaxa-allied communities of the Arrow Lakes as separate from the Ktunaxa or Kootenay as a whole.

C3-2 Portion of DeSmet's 1846 map, *La carte du territoire de l'Oregon* [Map of the Oregon Territory] (Jesuit Archives, Saint Louis, MO)



After 1846, archival documents and oral histories show Ktunaxa families in the Arrow Lakes maintaining a presence in the area, including exercise of Ktunaxa stewardship and cultural practice that continues to present day. A 1903 Indian Affairs Departmental Report from Indian Agent Galbraith concerning the Arrow Lakes Band in the Kootenay Agency includes description of the individuals living in the region as Shuswap and Kootenay, "who have lived and hunted for years along the Columbia River…follow hunting, trapping, and fishing…and during the summer they pick and dispose of [sell] the wild berries in the towns of Nakusp, Revelstoke, Trail, and Castlegar" (Canada, 1904).

Galbraith also indicated in his records that there were two distinct Arrow Lakes communities living without reserves–one based in the area of Burton and Caribou City, and a smaller one based at the confluence of the Kootenay and Columbia Rivers. Census records from 1881, 1891, 1901, as well as court trial records from 1909, clearly indicate that Ktunaxa families living at the Arrow Lakes at this time included the families of Frank Joseph (also known as Frank Kootenay), his brother Louie, their father (Joseph Kootenay) prior to 1901, and their families, all of whom were registered as part of the Oatscott Reserve (Kootenay IR 7) in 1903. Other Ktunaxa families living on the Arrow Lake in later years included members of the Goodman, Louie, and Capilo families.

In 1909, Frank Joseph / Kootenay was charged and tried for killing Antoine (Annie Joseph's brother) on the shores of Arrow Lake near Fauquier. Trial documents indicate that Frank Joseph / Kootenay was a "member of the Kootinai Tribe Reserve in East Kootinai. Louis Kootenay is brother. Married to Antoines sister. Franks wife dead but he has two girls and at Burton now" (BCA GR-0419/136/87). Marion Christie was called by the Crown as a witness and noted as Alec (or Alexander) Christie's older sister from Castlegar. Alec Christie's child had recently passed away, and Marion Christie had traveled to Burton City to mourn with him. She reportedly stayed in a tent at Cariboo City with her brother, nieces and nephews, as well as Frank Kootenay and his children. Frank relied on Alec Christie for help following the murder. Alec attempted to convince Frank to escape across the border to avoid a trial and jail time, and when Frank refused, the two left Cariboo City and instead went south to where Alex's brother, Baptiste Christie, was living near Thrums (present day Castlegar).

Alec Christie later became a prominent figure in the area in part because of his relationship with ethnographer James Teit. Teit conducted extensive research in the late 1800s and early 1900s with the coastal and interior indigenous peoples of what is now British Columbia; writing detailed field notes, journal entries, and correspondence. A significant portion of his work was concerned with defining and documenting traditional territories in the pre-contact period, and, later, with indigenous land rights post-Confederation. Teit's earlier work focussed on Salish speaking groups. In a letter Teit wrote to anthropologist Franz Boas in 1909, prior to his spending substantial time in the Arrow Lakes area, he understood the Arrow Lake band to be composed primarily of "Lakes" people, but that they likely spoke Ktunaxa and inter-married with Ktunaxa people:

> *…The Kootenay mouth people say emphatically that the Arrow Lake band are their own kin and speak the exact same language as themselves. They have intermarried from time to time with the Shuswap and in a less degree with the Kootenay. At the present time the Arrow Lake band is made up of some 24 who may be called Lakes, and one Shuswap (from Spallumcheen) and one Kootenay (from Kootenay Lake) both women married there making about 26 altogether. They were all mentioned by name to me and some of them are cousins and other relations to the Kootenay mouth band (the latter number eleven—10 Lakes and 1 Thompson)… (Teit, letter to Boas dated May 20, 1909)*[8]

[8] Teit's understanding in 1909 was later corrected through a visit in 1914. He uses the term 'Lakes' generally and appears to include Ktunaxa, Shuswap and Okanagan-Colville speakers under the term.

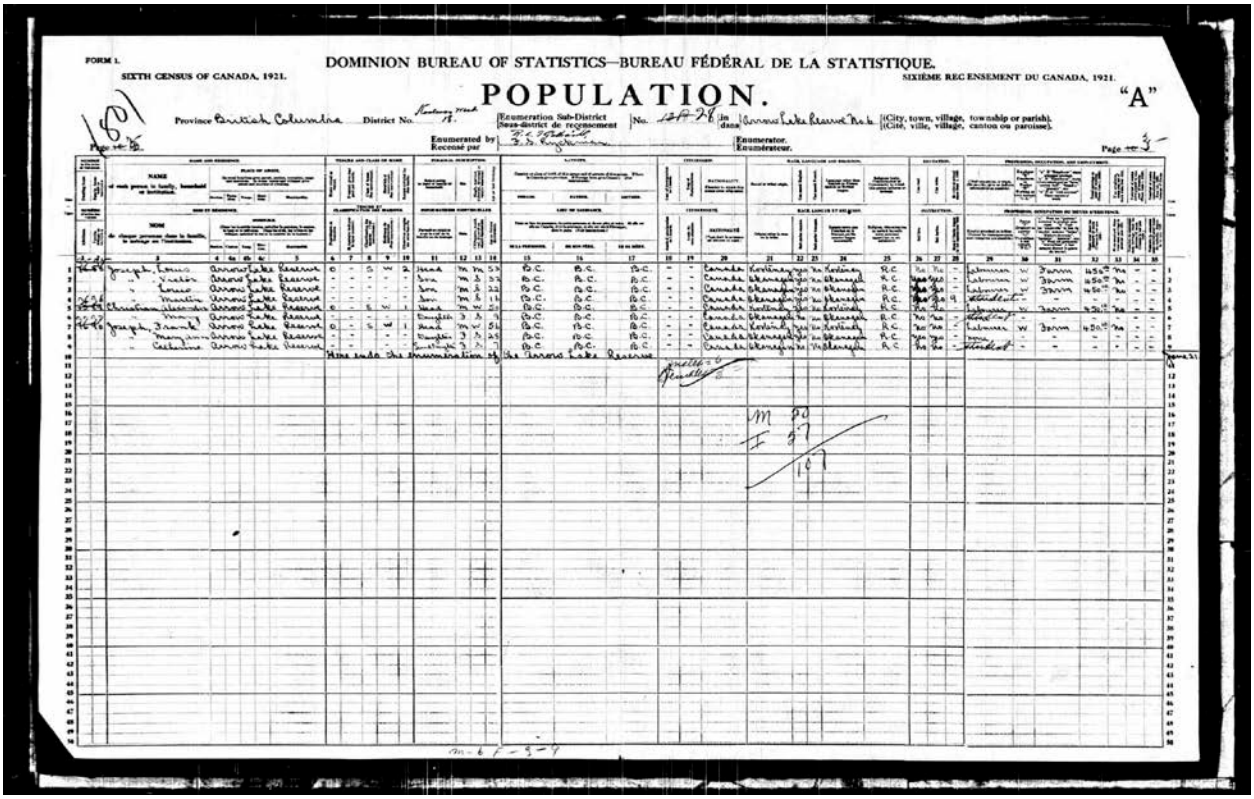
Teit's early writings about the Kootenay or Ktunaxa were based on information gathered from other indigenous groups, as he noted in his field notes that he "did not have the opportunity to interview reliable old men of the Wenatchi, Chelan, Methow, Lower Okanagon, Colville proper, Kootenay, Umatilla, and Snake although I saw some numbers of these tribes" (1910-1913). As he continued his efforts to document the complexity of tribal boundaries and dynamic tribal relationships, he began to work directly with the Ktunaxa, as well as other groups, including the Shuswap, to help convince both provincial and federal government representatives of needed changes to the Indian reserve system. In 1914, he had an extended visit with the Christie family near present-day Castlegar, documented in his unpublished field notes, correspondence with government officials, and photographs.

Through the 19th and 20th centuries, the family of Frank Joseph / Kootenay, Marian Goodman, and others, maintained Ktunaxa presence in the Arrow Lakes area. Ktunaxa elders and families continued to regularly visit and reside at the Arrow Lakes and maintained the continuity of cultural traditions. Multiple Ktunaxa elders have reported travelling to Burton annually in the early 1940's for large Ktunaxa cultural events and seasonal harvesting, including during spawning periods.

> *[In the lake at Burton reserve, they fished for] Salmon. Yeah. And [her husband's] mom used to dry it or smoke it, I don't know what she used to do, smoke it. And then when they come back to visit sometimes, gee, we'd have a lot of fish and she used to can salmon, her and her daughters, used to can salmon. And people used to can, she'd bring back maybe more than 10 cases of salmon, little ones, bigger ones and then big jars and then a lot of smoked salmon, oh, I loved that...[This practice stopped] After when he went to Mission School, residential school, they never moved back there. (S08, February 5, 2013)*

> *…when we talk about these camps [at Burton area], I'm sure that they done the ceremony the evening before, two, three evenings before, say, they decided they wanted to harvest the fish. They would have had to... do this - have the ceremony... So when the people were camping all the way up there, it wasn't - like I was saying, it wasn't all about fishing or let's go for a boat ride kind of thing. No. There was - there was a job that had to be done. (Y04, April 20, 2016)*

C3-2 Arrow Lake Reserve Census, 1921 (Library and Archives Canada 016-E002872034)



DOMINION BUREAU OF STATISTICS—BUREAU FÉDÉRAL DE LA STATISTIQUE.

SIXTH CENSUS OF CANADA, 1921. SIXIÈME RECENSEMENT DU CANADA, 1921.

POPULATION.

"A"

He [elder's father] talked about the Burton area and the dances that were held there…I know there were Ktunaxa there because that's why he was going there...He just said they were picking berries, fishing on the way, hunting...It was in 1930...And then in the [19]50's... He talked about a big hall at Burton where the dances were held...Depending on the year, it could have been a dance celebrating the fish. It could have been – if it was in the wintertime it – probably the black tail dances, the Winter Dance. But I think for this area we'd probably [be] focusing on a fish dance..." (S10, April 18, 2016)

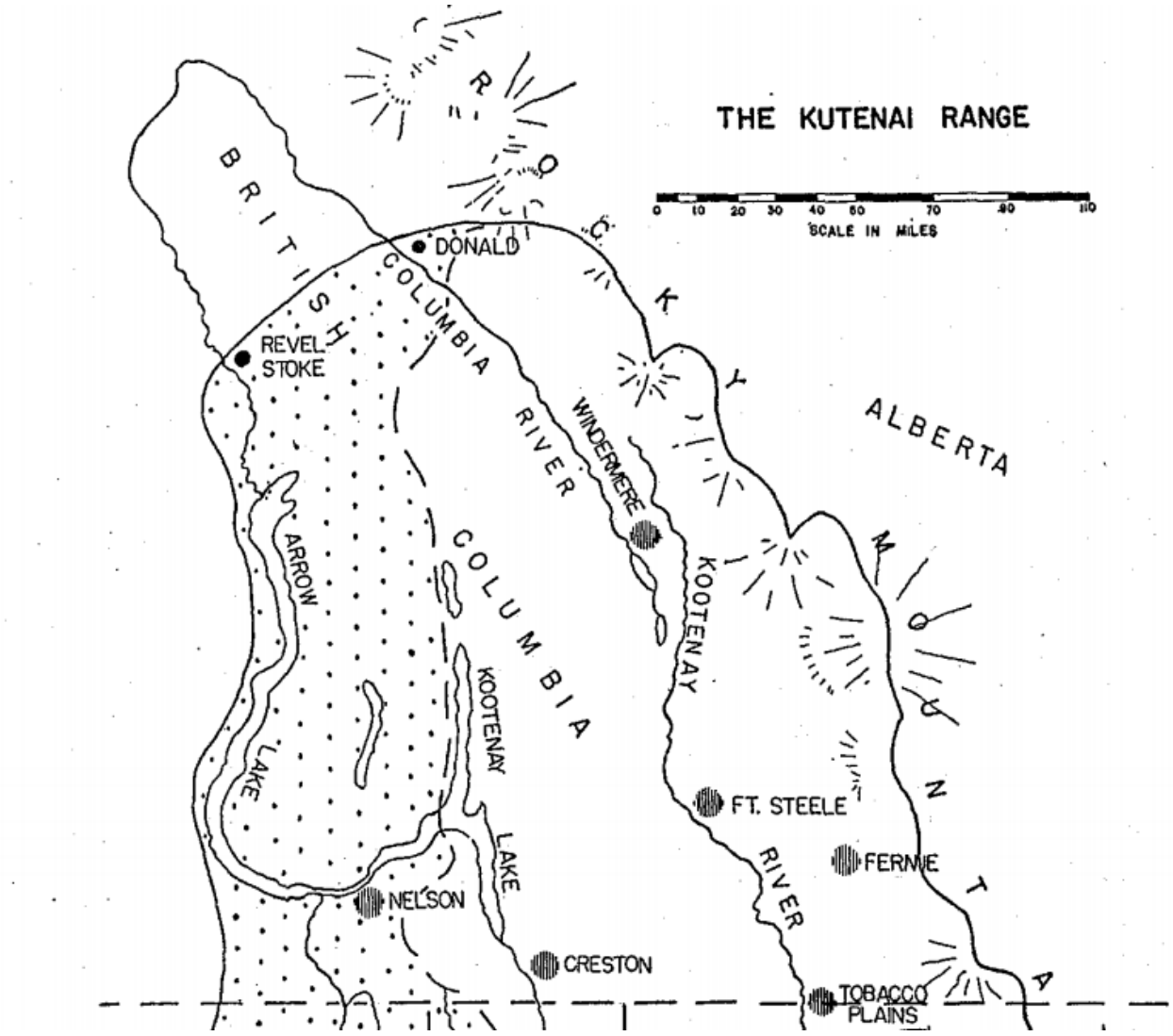
Other large Ktunaxa events, including Ktunaxa Annual General Assemblies have occurred at the Arrow Lakes in more recent years, and the area remains an area of active Ktunaxa stewardship within the land district of Mi¢qaqas ʔamakʔis.

Because Yawuki·kam is the one who gave us, in today's version, title, [to] that area…especially my grandmother would say there's going to come a day when there's going, there's going to be talk of who really owns it. And Yawuki·kam, no one really knows who, other First Nations wouldn't know who Yawuki·kam is but we know what he done for the Kootenays …he gave us two things. He gave us the lake and our unique bow…to us as a unique First Nation. (Y14, April 20, 2016)

Based on fieldwork in the 1930's, Turney-High (1940) questioned expert Ktunaxa knowledge holders regarding the western extent of Ktunaxa territory and found that, based on accounts from Bonner's Ferry,

Creston, Tobacco Plains and Flathead Lake, "...with but one exception they all claimed Arrow Lake and its shores." While access to Turney-High's field notes has not been possible, his published work mentions that Ktunaxa occupation of the Arrow Lakes was continued by the descendants of 'two Kutenai brothers…at a relatively recent date" (Turney-High 1940: 24). This is most likely a reference to Frank and Louie Joseph / Kootenay and their descendants, many of whom continue to maintain Ktunaxa cultural and stewardship responsibilities in the area.

C3-3 The Kutenai Range from Turney-High 1940



C3.2.2 Current Ktunaxa Use and Occupancy

> *I would say that according to my uncle, the whole area, that whole water area, all the way up [Arrow Lakes to Revelstoke and beyond] was - there was fishing activity happening. There were different camps set up... And the only reason why it's no longer there is because it - it was flooded... [When were Ktunaxa last using traditional weirs at this place?] As late as - as late as - I would say they were probably still using them in the '40s... Yes. I would say that they were still using fish weirs and still doing the - the corral things... [They would be catching] a lot of rainbow trout, a lot of rainbow trout, whitefish, squawfish, suckers...sturgeon...Sturgeon is what you might call a delicacy... (Y04, April 20, 2016)*

While impacts to Ktunaxa rights as a result of inundation and hydro-development have been widespread in the MCR, Ktunaxa elders and land users continue to actively use and occupy the valley and surrounding mountains for the practice of Aboriginal rights. Land use and occupancy interviews conducted between 2015 and 2016 (see methods in C1 above) reinforce the data from the KNC Diet Study and indicate that while Ktunaxa use of the MCR and Arrow Lakes is impaired by industrial impacts and historical barriers, the Columbia valley continues to be widely valued and used by Ktunaxa citizens.

Figure C3-2 shows the spatial distribution of site-specific knowledge and use values reported by Ktunaxa citizens through interviews based on five broad categories of use.[9] A total of 109 site-specific values have been mapped to date within the regional study area. The data show the range and wide geographic extent of Ktunaxa practice in the Arrow Lakes region and nearby areas based on the living knowledge and practice of today's Ktunaxa citizens.

Specific traditional use activities and other key values reported by KNC members within the RSA for Revelstoke 6 Extension Project include:

- 39 cultural/spiritual areas including teaching areas, ceremonial areas, gathering places, and other places of importance to Ktunaxa oral history and relationship with the upper Columbia River and Arrow Lakes. Burial sites, cultural or archaeological sites, and rock art sites were also reported.
- 25 subsistence values including kill sites for mule deer and moose, bear, grouse, and beaver, numerous recorded fishing sites for salmon, kokanee, and rainbow trout, including fish weirs used by Ktunaxa people until at least the 1940's. Additionally, Ktunaxa participants identified several areas used for gathering berries, food plants, and firewood. Preferred access is generally by water, especially where road access is difficult.
- 22 habitation values including the former Oatscott village site, as well as cabins and campsites occupied during seasonal harvesting, and campsites near Revelstoke, Nakusp, Burton, Castlegar, and elsewhere.
- 8 environmental features including key habitat areas for grizzly bear, elk, moose and mule deer, as well as important fish spawning areas.

[9] To account for margin of error and to protect confidential information, all Ktunaxa data were randomized and buffered. Points were randomized by 250 m, and then 1 km buffers were generated around all points, lines, and polygons.

- 15 transportation features including a network of canoe and portage routes, and trails that connect Kootenay Lake and the wider Ktunaxa territory with the Arrow Lakes area. Other mapped features include corridors used for hunting moose, grouse and other species.

Figure C3-4 **Reported Ktunaxa Site-Specific Values within the Revelstoke 6 Extension Project RSA by Activity Class**

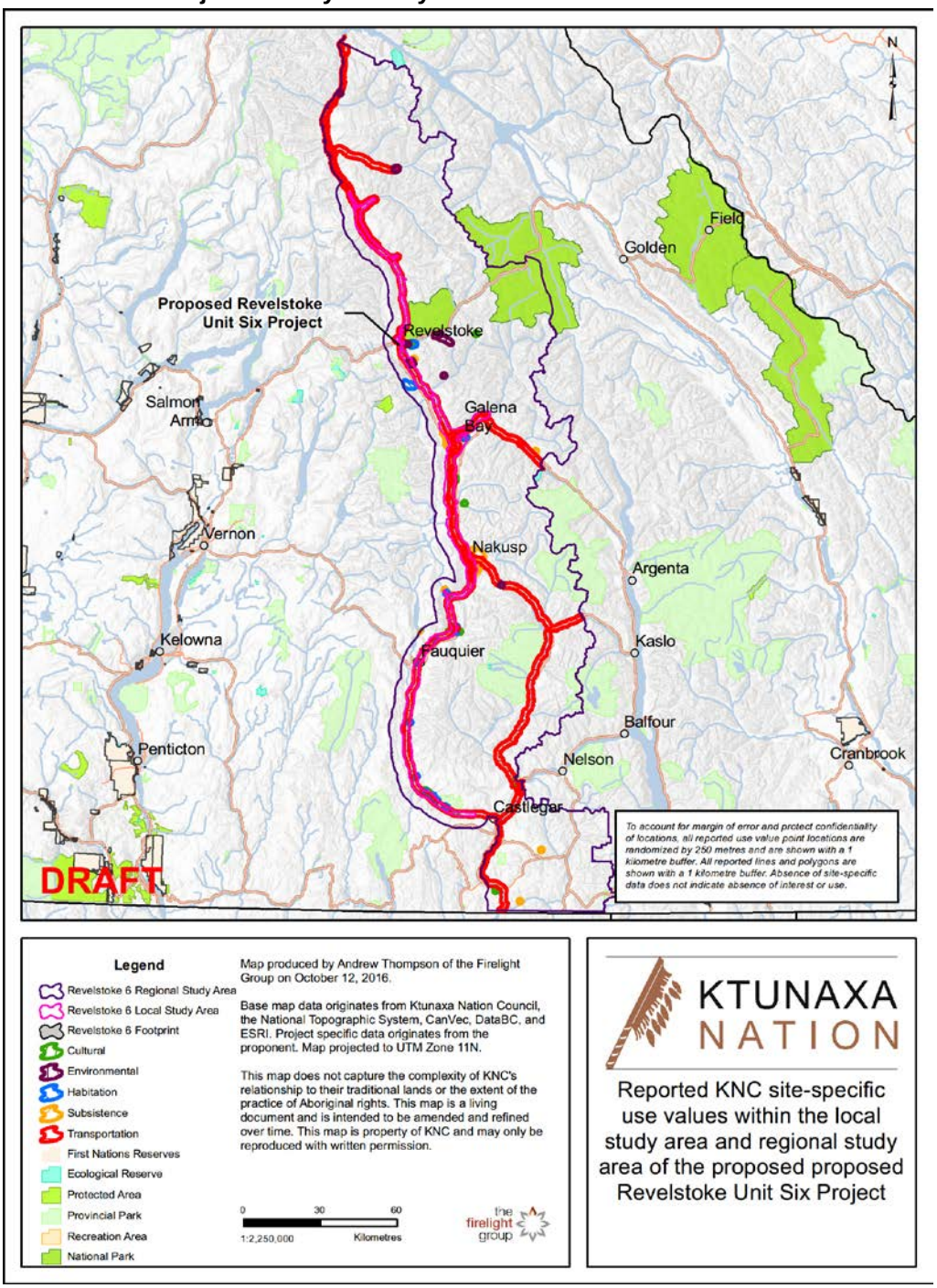
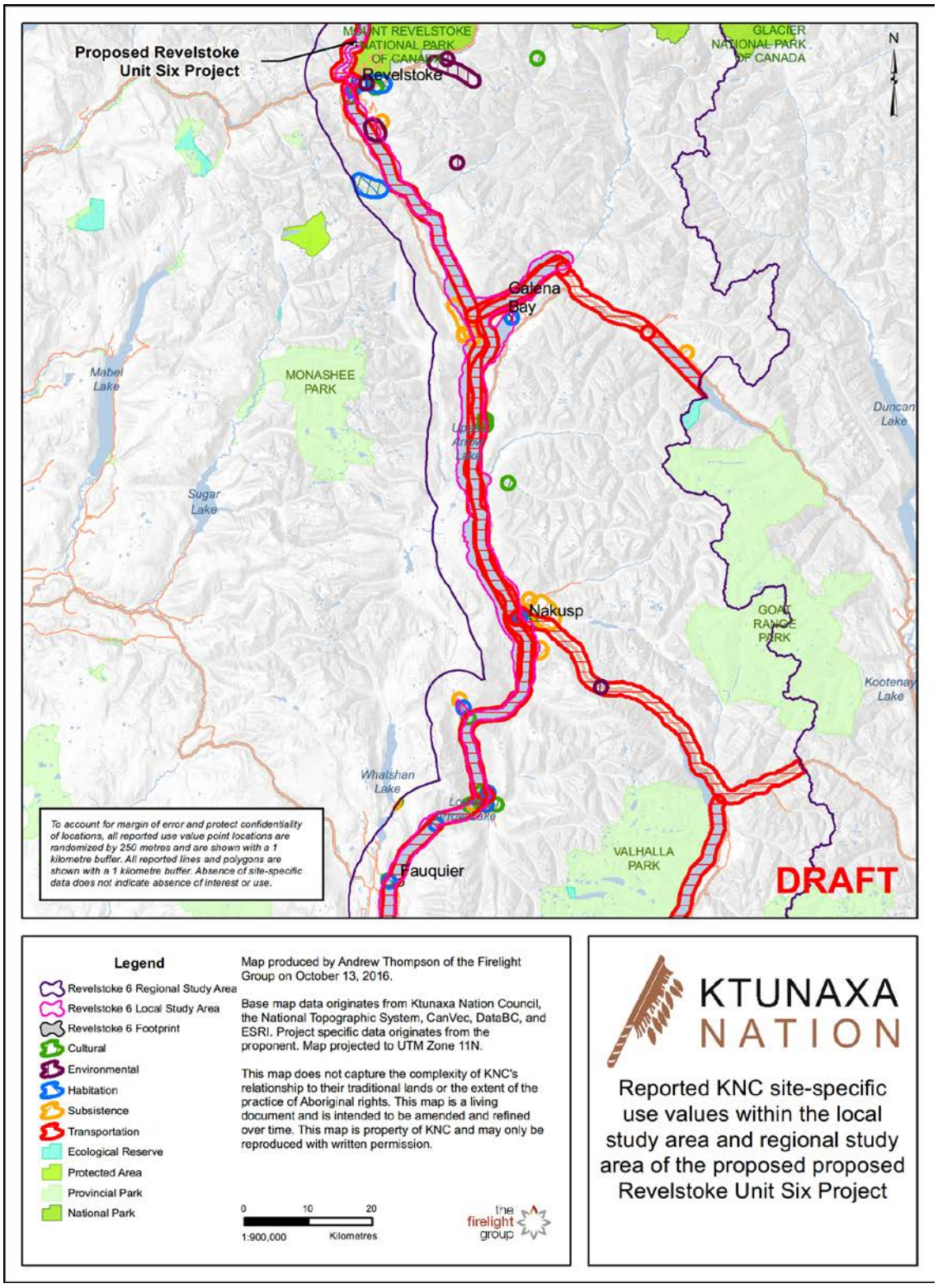


Figure C3-5 **Reported Ktunaxa Site-Specific Values within the Revelstoke 6 Extension Project RSA by Activity Class: Revelstoke to Burton**



All mapped values are based on Ktunaxa use and occupancy reported by Ktunaxa citizens through mapping interviews.

Within the LSA, 61 site-specific values were identified, including:

- 12 subsistence values including deer kill sites, beaver trapping, several fishing areas for trout, kokanee and salmon (historically), including near the Revelstoke area (Coyote Rock and in the area of the current Revelstoke facility), areas associated with fish weirs, as well as harvesting sites for several species of berries and edible plants.
- 22 cultural-spiritual use values including three ceremonial places or areas related to celebration of first fish or first harvest, burial sites and memorials in the southern portion of the LSA, archaeological sites, and teaching areas important to Ktunaxa culture, oral history and relationship with the Arrow Lakes and Columbia River, including a Ktunaxa village site on the north side of the Illecillewaet River.
- 17 habitation values including homes of Ktunaxa citizens in Revelstoke, the historic village site north of the Illecillewaet, a trapping cabin downstream, and temporary or permanent campsites associated with practice of hunting, trapping, and fishing rights in the Columbia River and Arrow Lakes area.
- Exceptional winter ungulate habitat and grazing in the upper Columbia River floodplain near Revelstoke.
- Several transportation routes including hunting corridors accessed by road and vehicle, water routes accessed by boat and ancestral routes used in the past to travel from Burton and the Arrow Lakes to Kootenay Lake and elsewhere.

In addition to the site-specific values mapped by Ktunaxa knowledge holders and based on Ktunaxa oral histories, non-site specific values reported include Ktunaxa tangible and intangible cultural properties and heritage sites in the vicinity of the Project including:

- Non-site specific values associated with particular species, including caribou, sturgeon and salmon, that are now not regularly harvested by Ktunaxa people in the area.
- Oral histories of Mi¸qaqas ʔamakʔis including the creation of the Arrow Lakes and naming by Na⁴muq¢in, the giant animal being known through the Ktunaxa creation story, Yawuki·kam stories related to the rights of Ktunaxa peoples in the area, and oral histories regarding alliances, battles, and ceremonial and cultural practices pre-dating 1846, especially in the area of Revelstoke, the Illecillewaet River and downstream along the Columbia River, Beaton Arm and Arrow Lakes.

Table C3-1 provides a summary of reported values within the Project LSA and RSA.

Table C3-1 Reported Ktunaxa Site-Specific Values within the Local Study Area and Regional Study Area

Activity class type	Number within Local Study Area	Number within Regional Study Area
Environmental features	5	8
Transportation	5	15
Habitation	17	22
Subsistence	12	25
Cultural / Spiritual	22	39
Total	**34**	**109**

C3.2.2.1 Existing impacts and Ktunaxa Experience with Past Hydropower Dam Effects

Several Ktunaxa participants identified important physical and cultural barriers to Ktunaxa use of the MCR and Arrow Lakes due to impacts related to Hydro developments and management of flow. Thus, while some Ktunaxa citizens continue to hunt and practice subsistence rights in the area, many land users indicated that their parents' generation used the MCR and Arrow Lakes to a greater extent than themselves. A primary reason for declining Ktunaxa use in the area is because of the impact of hydro dams on fish and other aspects of the environment:

> *Arrow Lakes is part of the Columbia River drainage system. Fishing was huge… And it's not there today, the salmon…the only time I ever got to eat salmon is when I would go to the Okanagan, to visit my relatives, you know. But the Fraser River supplied them. And the Columbia has supplied them, as well, before all those dams came into place. (Y05, April 16, 2016)*

Ktunaxa knowledge holders draw on a long history of experience with Hydro development on the Columbia, as well as elsewhere on Ktunaxa lands. Existing impairment of Ktunaxa use suggests that cumulative effects in portions of the MCR affected by the Project have already exceeded a threshold of significant and adverse effect on Ktunaxa use and that existing Hydro development is a major contributing factor. The duration of this impaired use is already in excess of one generation and is widespread in the Ktunaxa community; this means that a large body of cultural knowledge related to the area currently held by a small number of Ktunaxa knowledge holders, is at risk of being lost unless Ktunaxa language, knowledge, use and occupancy in the region can be supported and revitalized.

> *[Because of industrial development in the area, there's] fewer animals - they've really affected the caribou...Affected their movements, their path. Their routes. They're traditional, so the caribou out there in that range are gone…Caribou are affected, the elk are affected - all the big game are affected in the area...Like the region is still pretty rich in good things but there's a reason why the population trickled away. (Y13, April 21, 2016)*

> *It's underwater...I mean Burton, 150 or 200, of the 215 acres is under - 200 is underwater...Well we still have a cabin [in the area]...There's still a cabin on Mosquito Creek, which was great-grandma's [trapping] cabin...[Have you ever stayed in that cabin?] No. remnants is all that's left of cabin...Great-grandma was there in the 1920s/30s...my family used to farm out there too. (Y13, April 21, 2016)*

> *[Coyote Rock--cultural site near Revelstoke] It's flooded. It's under water now, but it's just in this area some place. And it was Coyote Rock. I don't know what he did wrong, but he got turned into a rock there...They always brought him back to life when he got killed or turned into rock or something. One*

of his friends would come by. And they'd step over him three times and he'd come back to life. Come back to life and then he'd continue his journey. (S10, April 18, 2016)

Well one of the things, besides flood, is the fish seemed to disappear. The normal fish that you would see, the rainbow trout, you know...with the people that was a delicacy...Because all of a sudden there was no more fish. Yeah. There was no more - what did they call that? - spawning happening. You know how they come up to spawn and whatnot. Yeah. And I think that he was talking about the salmon being gone. [Through ceremony, we] were trying to bring them back through dance. (Y04, April 20, 2016)

C3.2.3 Future Ktunaxa relationship with and knowledge of land and water

…there's an old story according to our legends, again it's prediction from ¢iɬqum saying that there's going, there's coming, he was predicting that the dams, there's going to be dams…and pretty soon…you have to share the food because there's coming of the times where the salmon is going to be no more salmon… it's not going to be as plentiful as once was. And that prediction, according to my grandparents and the story, the story that's been told, it talks about the dams that's, that was going to be building. (Y14, April 20, 2016)

As a valued component, future Ktunaxa relationship with and knowledge of land and water includes the ability of Ktunaxa citizens to maintain cultural relationships, including realizing plans for cultural and linguistic revitalization. Maintaining cultural relationships includes establishing future relationships with the MCR and Arrow Lakes in order to repair ecological and cultural impacts incurred over the past century, and to support the maintenance and reclamation of Ktunaxa relationships with, and knowledge of, Ktunaxa cultural landscape by future generations of Ktunaxa citizens.

Because it's for, to this day I still go that [Arrow Lakes] area for, to renew my relationship to the, to the site, to perform, the ancient old practice. And just to preserve the continuity of chain of practices, I still do that, yes...I still make my rounds to the, to the sites in, to commemorate my, or with my grandma's teachings, to honour our ancestors who fought hard, who gave up their lives for those sites. I still go there and I still perform ritual, practices...I do it every year. (Y14, April 20, 2016)

C3.2.3.1 Current Ktunaxa Harvesting in the Upper and Mid Columbia River

The results of the 2012-2013 Ktunaxa Diet Study indicate that, despite industrial impacts including hydro-electric dam construction and forestry, the Ktunaxa continue to use the Arrow Lakes and MCR, for the harvest of a range of traditional foods and for the practice of subsistence rights including hunting, fishing, and plant food collection. The Diet Study was conducted by KNC and the Firelight Group (Fediuk et. al. 2015) using diet surveys conducted with a random sample of on- and off-reserve Ktunaxa households. Ninety-two households participated and 98 individuals completed surveys. Just over half of the households randomly selected were in the Cranbrook area, with the remainder living in the Grasmere, Creston and Columbia Valley areas. Despite the study's focus on traditional food use in the East Kootenays, ten percent of respondents reported harvesting huckleberry in the Upper and Mid Columbia River area with some returning to harvest in the area every year (Fediuk et al. 2015). The study also shows Ktunaxa moose hunting and trout fishing in the area. These results are consistent with TUS interview data summarized in this section, which indicate that Ktunaxa from yaqan nuʔkiy (Lower Kootenay Band in Creston area) continue to use the area for berry picking, deer and moose hunting, and fishing.

> *[Berry picking in 2009] I wanted to stay in Nakusp and we got about 30 gallons and were picking for 10 gallons a day, we stayed, just a day, no, two days, three days, I forgot how many days we stayed there and we pretty near filled all our containers, we had to get some cardboard boxes, we were running out of containers, so we lined it up with wax paper and then we left them containers. Oh, the huckleberries were good there, I wanted to go there again. (S08, February 5, 2013)*
>
> *I always enjoy and Arrow Lakes just feels really comfortable to me...Because there's the family connection to the land...I'm still going to be going out there and doing another trip this summer. (Y13, April 21, 2016)*

Fediuk et al. (2015:50) report that there is a strong desire by Ktunaxa to increase traditional food consumption and would eat more traditional foods if they were available, but many identified the decline in fish and berry availability, and food safety concerns as key barriers. At least some Ktunaxa families believe fish caught in the Arrow Lakes should not be eaten because pre-dam Ktunaxa burial grounds are located beneath today's low water levels in the Arrow Lakes and MCR.

C3.3 Traditional Knowledge and Language: Project Effects, Mitigation and Significance

This section outlines the anticipated effects of the Project, recommended mitigations and actions, residual effects, and determination of significance for valued components associated with the Ktunaxa traditional knowledge and language sector.

Assessment of Project effects is based on methods outlined in Section C1. Major impact pathways from the Project relevant to Ktunaxa Traditional Knowledge and Language are shown in Figure C1-4; these are based on Ktunaxa knowledge, and on the Project absent additional Ktunaxa mitigations recommended below and in section C11.

Without additional mitigation effort, adverse Project impacts relevant to the Ktunaxa Traditional Knowledge and Language sector, including use and occupancy, would occur during construction and operations, and during reclamation and closure (beginning in approximately 2123). Impacts during construction and operation would be most severe and are assumed to last more than100 years. Impacts would result from adverse Project impacts to Ktunaxa lands and resources, including increased flow velocity, peaking, and erosion within the LSA.

The Project would have overall adverse effects on Ktunaxa knowledge and use in the LSA and RSA resulting from impacts on traditional use of lands and resources by Ktunaxa citizens as a result of increased erosion and disturbance of habitat and:

- Ongoing impairment of Ktunaxa sense of place and relationships to water, mountains, and the natural world within the LSA and downstream within the RSA for the life of the Project;
- Increased variation in water flows in the LSA resulting in an extension of Ktunaxa knowledge holders' ongoing concern regarding erosion and impact in the Project area;
- Resulting cultural erosion of existing practice of traditional use, knowledge, language, and values in the LSA and downstream within the RSA, and;
- Impairment of the ability of Ktunaxa citizens to maintain particular place-based Ktunaxa knowledge and values, including associated oral histories in the area of the LSA and downstream within the RSA.

C3.3.1 Intangible Cultural Resources: Language and Place-specific Ktunaxa Knowledge

The Ktunaxa language is critically endangered. Place-specific Ktunaxa knowledge of the Arrow Lakes and adjacent areas of the LSA is also endangered. Impacts on Ktunaxa language and place-specific knowledge in the LSA are largely due to industrial displacement of Ktunaxa practice; these impacts have occurred over multiple generations and have resulted in measurable and perceivable adverse changes in culturally important place-based knowledge and language that are of concern to Ktunaxa citizens. As such, impacts on Ktunaxa intangible cultural resources in the LSA and RSA are already well past a threshold of significant and adverse effect on intangible cultural resources. Additional negative pressure from the Project would increase the severity of existing significant adverse effects on intangible cultural resources. Measures taken by the Project to increase resources available to Ktunaxa Traditional Knowledge and Language would help offset these already significant impacts.

Without the mitigations outlined in C11, the Project is likely to result in:

- a continued absence of Ktunaxa language and place names in day-to-day operations;
- a continued trend of decline and erosion in the presence and visibility of the Ktunaxa language in the Arrow Lakes and MCR region;
- reduced opportunities for transmission of place-based Ktunaxa language and knowledge; and,
- further losses to already critically endangered Ktunaxa language and knowledge.

See subsections C2, C3, C4, C5, C6, and C7 for an illustration of the Project effects that the mitigations and measures in Table C11-1 are designed to address. Mitigations are designed to reduce the impact of potential negative effects and to increase the impact of potential positive effects. The mitigation measures identified below are intended to reduce, manage and, where feasible, compensate for residual Project effects to Ktunaxa Title, Rights and Interests. They reflect currently available knowledge and information, and may evolve as the Project EA progresses. See section C11 for Ktunaxa mitigations and measures relevant to the valued component of intangible cultural resources.

C3.3.2 Tangible Cultural Resources: Cultural Areas and Properties

The ability of Ktunaxa citizens to use and rely on cultural areas and properties in the LSA and RSA, including the availability of preferred species and resources at preferred traditional use locations, has been severely impaired by the Revelstoke dam and other BC Hydro infrastructure on the Columbia River. These changes have resulted in measurable and perceivable adverse impacts on culturally important locations and tangible resources that are of concern to Ktunaxa citizens. As such, impacts in the LSA and RSA on Ktunaxa cultural resources are considered already significant and adverse. Additional negative pressure from the Project would increase the severity and extent of existing significant adverse effects.

Without the mitigations outlined in C11, the Project is anticipated to remove or impair areas of high value habitat identified by Ktunaxa knowledge holders (particularly for sturgeon, anadromous salmon, migratory birds, and other riparian dependent species – see section C7) associated with site-specific and non-site specific, past, present, and planned future Ktunaxa cultural values, hunting and subsistence practice. The Project would result in small, but incremental adverse impacts to the ability of Ktunaxa citizens to access preferred subsistence resources, such as sturgeon, within the LSA and RSA. The Project would also further impact Ktunaxa cultural areas and properties including disturbing the sense of place associated with enjoyment of Arrow Lakes and MCR cultural landscapes, especially by water .

Ktunaxa recommended measures and mitigations relevant to the valued component of tangible cultural resources are detailed in section C11.

C3.3.3 Future Ktunaxa Relationship With and Knowledge of Land and Water

The ability of Ktunaxa citizens to maintain relationships with the lands and waters in the MCR and Arrow Lakes, including the fulfillment of stewardship obligations, is currently impaired by BC Hydro impacts in the LSA and RSA. Industrial changes related to the Revelstoke dam, combined with lack of recognition of Ktunaxa title and stewardship, has resulted in the erosion of Ktunaxa governance and measurable and perceivable adverse impacts on culturally important rights and practices that are of concern to Ktunaxa citizens. As such, impacts within the LSA and RSA on the valued component of future Ktunaxa relationships with, and knowledge of, land and water have already surpassed a threshold of significant and adverse effect. Additional negative pressure from the Project would increase the severity and extent of existing significant adverse effects.

The Project would increase the overall magnitude and frequency of flow impacts in the LSA and RSA, and a resulting decline in the Ktunaxa relationship with, and knowledge of, lands and waters in the area.

Ktunaxa measures and mitigations relevant to the valued component of Future Ktunaxa Relationship are detailed in section C11.

C3.4 Traditional Knowledge and Language Sector: Characterization of Residual Project Effects

Based on reported Ktunaxa knowledge, and existing information regarding the Project, and based on the context of existing baseline impacts to land, water and Ktunaxa use of the MCR, and assuming successful implementation of all mitigations identified in C11, the Project is considered likely to contribute further measurable or perceivable residual adverse effects on all three valued components related to the Ktunaxa KNC Traditional Knowledge and Language Sector. The Project would result in a small but important increase in the magnitude of impacts to Ktunaxa use and knowledge, including impacts to

tangible and intangible cultural resources in the LSA and extending downstream of the Project within the RSA.

Downstream effects are anticipated as a result of

- anticipated impacts on important sturgeon and anadromous salmon habitat and aquatic productivity;
- declines in Ktunaxa confidence in resources and reduced use and knowledge transmission likely to result from these impacts, including declines in fishing and cultural use.
- impairment of the practice of Ktunaxa rights in the area of the MCR.

While the recommended mitigations and measures would support Ktunaxa citizens in coping with impacts, Project effects on the TKL VCs will remain measurable, perceivable and generally adverse.

Table C3-3 characterizes anticipated residual Project effects relevant to the Traditional Knowledge and Language sector. Because of existing impacts, the sensitivity or vulnerability of Ktunaxa tangible and intangible cultural resources and future relationships with lands and waters is considered to be high. While the size of the Project effect is relatively small, the cultural importance of nearby water routes, ancestral village areas, subsistence resources, and cultural places in the LSA and RSA, including downstream values, is high. Therefore, the magnitude of effect is considered low to moderate. Effects would be frequent through construction and operations and some effects may extend downstream into the RSA. The duration of the effect on use and knowledge is expected to be greater than 20 years, and a condition similar to baseline is unlikely to be achieved after that time, thereby interrupting multiple generations of Ktunaxa use and knowledge. This effect is anticipated with a moderate degree of confidence because of uncertainties inherent in BC Hydro's baseline.

Table C3-3 TKL Sector Characterization of Residual Project Effects

Valued Components	Magnitude	Direction	Geographic Extent	Duration	Frequency	Reversibility	Likelihood	Context
Intangible Cultural Resources (including language)	Low to Moderate	negative	Primarily LSA	Permanent (> 1 generation)	Daily during winter	no	likely	vulnerable/ medium confidence
Tangible Cultural Resources (including use)	Low to Moderate	negative	Primarily LSA	Permanent (> 1 generation)	Daily during winter	no	likely	vulnerable/ medium confidence
Future Ktunaxa Relationships with Land (and Water)	Low to Moderate	negative	Primarily LSA and RSA	Permanent (> 1 generation)	Daily during winter	no	likely	vulnerable/ medium confidence

C3.5 Traditional Knowledge and Language Sector: Significance of Residual Effects

The Project is anticipated to result in changes in the environment that will result in measurable and perceivable adverse impacts on culturally important rights and practices that are of concern to Ktunaxa citizens, including impacts on transmission of place-specific language and knowledge, use of lands and resources including hunting, trapping, fishing, and riparian plant use, access to preferred species and resources including sturgeon, caribou, aquatic fur, migratory birds, and potential for future salmon harvesting.

Based on available information, residual effects of the Project are considered likely to intensify the magnitude of existing hydro-electric impacts and make recovery of white sturgeon, and anadramous salmon, as well as other culturally important species and habitats, more difficult along the MCR and potentially upstream within the Revelstoke Reservoir. The Project will result in reduced opportunities for Ktunaxa rights-based cultural practice, including reduced opportunities for transmission of place-based and species-based knowledge and practice to future generations. Project related increases in erosion will increase risk of damage to tangible Ktunaxa heritage sites and values, including burials, archaeological sites, and the overall cultural landscape of the MCR. Archaeological mitigation will not fully address Ktunaxa cultural and heritage impacts to particular sites or cultural landscapes. Ktunaxa access to cultural places and values along the shoreline of the MCR, and potentially the Revelstoke Reservoir, by boat during ice-free periods, and by foot or snow-machine in winter, will be impaired as a result of impacted shorelines, more difficult navigation, and unpredictable snow and ice conditions. Impaired access will have adverse effects on the ability of future Ktunaxa generations to reliably access shorelines for the practice of Ktunaxa rights.

Considering the already significantly impacted context within which Project impacts will take place, and absent resolution of concerns in a manner acceptable to the Ktunaxa Nation, the residual effects of the Project on Ktunaxa rights, title, and interests related to the TKL sector, including tangible and intangible cultural resources and relationships to lands and waters, are anticipated to be adverse, measurable and perceivable, and will effect vulnerable and culturally important rights and interests. As such, residual Project effects on all three TKL VCs are considered likely and significant. If the Project is built, Ktunaxa citizens will have fewer opportunities to hunt, fish, visit, and practice rights in areas near the Project and downstream in the MCR, and potentially upstream in the Revelsoke Reservoir. Impacts to cultural heritage values will continue to result in irreplaceable loss to endangered Ktunaxa knowledge and language. Ktunaxa place specific knowledge connected to nearby areas, and practices reliant on fish and fishing downstream of the Project, including the Arrow Lakes, are likely to be particularly affected. This significance evaluation is based on impacts to Ktunaxa land users and families most closely connected to the Arrow Lakes as the most sensitive Ktunaxa user or receptor, is based on post-mitigation residual effect, and is made with medium confidence. Greater confidence could be achieved with improved modelling and assessment of baseline effects in section B, and additional Ktunaxa-based research and documentation of Ktunaxa knowledge and values affected by the Project.

C4 KTUNAXA RIGHTS: ECONOMIC INVESTMENT SECTOR

This section summarizes current understandings of Ktunaxa rights, title, and interests (see section C1) related to the Ktunaxa Nation Council (KNC) Economic Investment Sector that have the potential to be affected by the Project, for better (benefits) or worse (adverse effects).

The KNC's overarching vision related to the economic sector is: "Strong, healthy citizens and communities, speaking our languages and celebrating who we are and our history in our ancestral homelands, working together, managing our lands and resources, within a self-sufficient, self-governing Nation." The mission is: "To cultivate a healthy, self-sufficient Ktunaxa economy; along with communities, partners and neighbours, we achieve sustainable growth and equitable development through equitable access to economic resources and opportunities, while respecting Ktunaxa land, culture and values" (Ktunaxa Nation Council Economic Investment Sector 2016). The objectives of the Economic Investment sector are to support business development that is grounded in Ktunaxa cultural values and encourages self-reliance. The Ktunaxa economic development mandate starts with a desire "to cultivate economic development through entrepreneurship and business opportunities in our communities."

The economic sector focuses on self-sufficiency, which means building and facilitating a strong economic base. Each Ktunaxa community has a development corporation, as does the nation. The bands are taking on different ventures and initiatives, building their own economic bases, facilitated by the Nation. To further the Nation's move toward self-sufficiency, a Ktunaxa Nation chamber of commerce is in the development stages. This chamber will be for Ktunaxa Nation businesses and for anyone who wants to be part of the economy of the Ktunaxa Nation. The sector is working to align Ktunaxa Nation and its businesses with businesses that want to partner with us.

For the purpose of this section, KNC has identified four measures or indicators related to economic investment:

- Ktunaxa rights-based economy[1] (including commercial rights and subsistence rights, addressed primarily in C3);[2]
- Ktunaxa preferred future economy;
- business development and procurement; and
- income.

Each of these is described below in more detail below.

[1] For the purposes of this report and subject to the limitations outlined in section C1, the Ktunaxa Rights Based Economy includes but is not limited to formal market (commercial) and informal non-market activities based on Ktunaxa Aboriginal rights to resources from their territory such as mining, fishing, harvesting, hunting, trapping, guiding, outfitting, agriculture, ranching, forestry, tourism and other economic activities.

[2] See section C1 for further discussion of Ktunaxa rights, title, and interests. The Ktunaxa Nation takes a broad view of their rights, including subsistence, commercial and governance rights. Commercial rights include rights to harvest, sell and trade resources including, but not limited to, fur, meat, fish, minerals and other products in ways consistent with Ktunaxa traditional law.

Specific goals related to the Economic Investment sector include:

- that Ktunaxa citizens should enjoy a standard of living comparable to that of the non-Aboriginal population living in the Ktunaxa ʔamakʔis;
- that there should be more jobs and an economic future with less outmigration and where the population in Ktunaxa ʔamakʔis is rebuilt; and
- that there should be increased Ktunaxa citizen participation in the employment and economic aspects of development within Ktunaxa ʔamakʔis, including increasing Ktunaxa engagement in direct and indirect business activities.

Before the establishment of the reserve system and *Indian Act*, and particularly before the impoundment of salmon by hydro dams on the Columbia, the Ktunaxa community of the MCR and Arrow Lakes had a vibrant economy based on resource use – including hunting, trapping, fishing, berry harvesting, and small scale mining – as well as commercial trade and wage labour at regional centres including Arrowhead, Nakusp, and Revelstoke, and work in barging and water based transportation along the MCR and through the Arrow Lakes region (see Section C3 for more detail). Ktunaxa citizens enjoyed an economy based on the rich resources of the region and traded with other Ktunaxa, other Indigenous Peoples and with non-Indigenous communities. The establishment of the reserve systems and the damming of the Columbia, combined with Canadian colonial policies regarding indigenous peoples, impacted the Ktunaxa traditional economy and resulting in a legacy of Ktunaxa economic exclusion in the region.

The establishment of the reserve system, among other systemic factors, created an unequal playing field between the non-Aboriginal and Aboriginal populations in the region (see Chapter C10 for more detail on cumulative effects). Although much Ktunaxa-defined progress has been made throughout the Nation, contemporary economy-building continues to occur within the context of colonization, social exclusion and political and economic marginalization (Pelkonin 2016). This has historically translated into unequal access for Ktunaxa citizens to economic development and procurement in their territory. This includes limited success of efforts to date to achieve higher Ktunaxa procurement with BC Hydro.

Though employment and procurement impacts and mitigations are important considerations, they are not the end goal. The primary Ktunaxa economic goal is: *increasing the standard of living among Ktunaxa citizens to a level comparable to that of their non-Aboriginal neighbours.* The aim of the Ktunaxa Economic Investment sector is, to the extent possible, and through a variety of mechanisms across the different indicators listed above as well as those in the other sectors, to focus the Project benefits on this broader goal.

C4.1 Economic Investment Baseline

C4.1.1 Baseline - Income and Economic Well-being

As with most Indigenous Peoples in Canada, Ktunaxa economic well-being lags behind that of non-Aboriginal Canadians. The 2009 Ktunaxa Census data indicates that the average Ktunaxa income was $24,380, with a median income of $17,987. BC median personal income in 2009 was reported at $27,970 (Statistics Canada 2013). Just over 50 per cent of Ktunaxa census respondents made below $20,000 in 2009. Average and median incomes for the Ktunaxa at present appear to equate to those of about 15 to 20 years ago for average British Columbians, and Ktunaxa citizens are over-represented in low income and poverty.

Low incomes are detrimental to health and wellness. Almost half (44 per cent) of Ktunaxa households included in the KNC Diet Study are food insecure (Fediuk et al. 2015). Forty per cent of Ktunaxa households reporting wages as their main income were food insecure, indicating that many jobs may be low paying or unstable (Fediuk et al. 2015).

Table C4-1 illustrates that community well-being indices for the on-reserve Ktunaxa populations are substantially lower than those of populations in the region and province but slightly above the BC Aboriginal indices. This index measures employment, housing education and income, which do not include the range of what matters for well-being to Aboriginal communities (Reading and Wien 2009). However, in those mainstream economic measures the index indicates a notable gap between Ktunaxa and the regional population.

Table C4-1 Community Well-being Indices for the Ktunaxa Nations

Ktunaxa Member First Nation	Community well-being index 20011
Akink'um?asnuq?i?it (Tobacco Plains Band)	64
?aqam (St. Mary's Band)	67
Yaqan nu?kiy (Lower Kootenay Band)	68
?akisq'nuk (Columbia Lake Band)	68
Revelstoke	81
British Columbia	74
BC Aboriginal	62

Source: AANDC community wellbeing index: https://www.aadnc-aandc.gc.ca/eng/1378411773537/1378411859280# and http://open.canada.ca/data/en/dataset/e5992e3e-709c-48f9-95fa-e39e57dd33b7

C4.1.2 Baseline - Ktunaxa Rights Based and Preferred Future Economy

The desired Ktunaxa Rights Based and preferred future economies are based on a balance between economic growth on the one hand and the protection of the land and Ktunaxa rights and livelihood on the other.

C4.1.2.1 Ktunaxa Rights Based Economy

The rights-based economy is important for both cultural (see Section C3) and economic reasons. As discussed above and in section C3, a vibrant Ktunaxa economy predates contact and industrial impacts from hydro-electric development on the Columbia, and included reliance on land and water for subsistence and for commercial trade including fish (e.g. salmon), beaver, otter, and other species. Both formal and informal economies continue to be important, including activities ranging from subsistence harvesting to guiding and agriculture. These economic activities are heavily relied on for economic and food security (Pelkonen 2016) and are important within the current Ktunaxa economy. While impoundment of the Columbia River has impaired or eliminated several key facets of former Ktunaxa economies (e.g., salmon and sturgeon fisheries, prime trapping areas), and contributed substantially to the development of non-Aboriginal communities and Crown coffers, meaningful Ktunaxa economic benefits from water use on the Columbia have been minimal or non-existent.

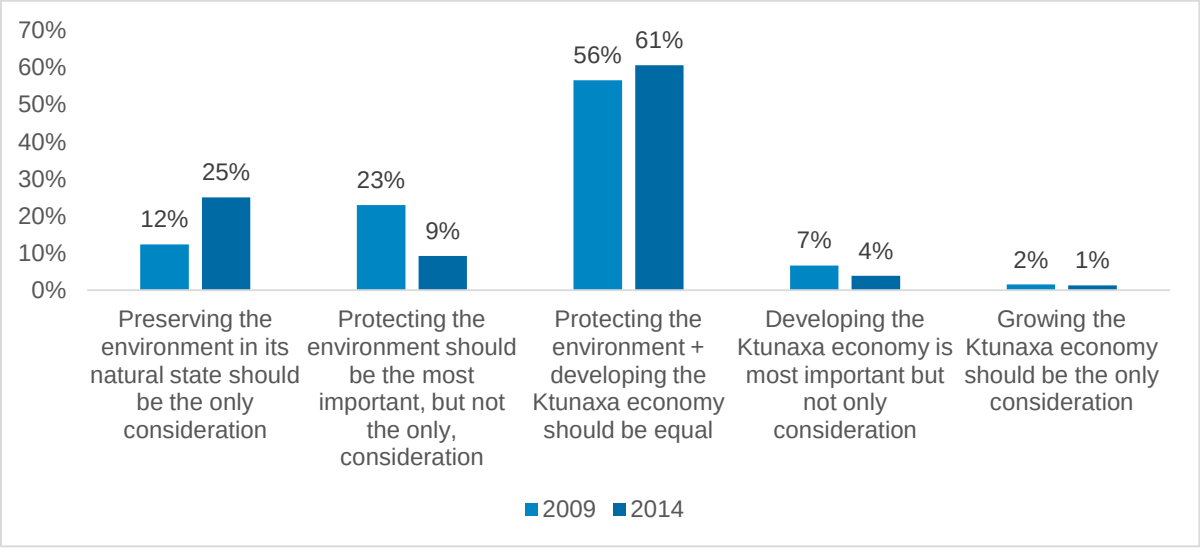
C4.1.2.2 Ktunaxa Preferred Future Economy

The proposed Project needs to be evaluated not only against its impact on current economic activity but also on the impact it will have on KNC's planned future economic activity. The Ktunaxa Nation includes

diverse perspectives. Stewardship values are widely held, but are balanced by a desire for growth and development within the nation.

The 2009 and 2014 Ktunaxa Census data indicate that the majority (61%) balance the two equally (Figure C4-1). There is a higher portion (34%) who feel the balance should be in favour of the environment as the most important or only priority compared to only 5% who prioritise the economy. These data support the KLR's "balanced" vision of development and the understanding that, for the majority of Ktunaxa citizens, both protection and growth are important, but that when the two principles are in conflict, stewardship (land protection) should be treated as a priority over economic growth (KLR 2006).

Figure C4-1 Ktunaxa Citizens' Preferred Balance of Economy (2009-2014)



Source: 2009 and 2014 KNC Census.

In a series of draft policy documents, KNC and member bands have identified a set of priorities for their preferred economic future as it relates to economic investment:

- sustainability;
- impact equity:
- economic self-sufficiency and development of business acumen;
- avoidance whenever possible of "futures foregone;"
- diversification:
- economic growth in Ktunaxa ʔamakʔis; and
- social support (The economy strengthens and reinforces culture, the rights based economy, engagement in cultural practices and identity).

For the purposes of this assessment, these principles for a preferred Ktunaxa future economy form key elements against which future development, including the proposed Project, can be evaluated.

Baseline Profile – Economic Plans

The Nation and the individual Bands have the following plans and process in place:

Ktunaxa Nation Council

The Nation Council has a number of different documents to guide the Economic Investment Sector and is in the process of a governance update (Pelkonen 2016). These include:

- Ktunaxa Economic Sector Overview, August 2013. The vision is: Strong, healthy citizens and communities, speaking our languages and celebrating who we are and our history in our ancestral homelands, working together, managing our lands and resources as a self-sufficient, self-governing Nation.
- Ktunaxa Nation Council: Ktunaxa Economic Sector Overview (Ponte, 2013). Mission: To cultivate a healthy, self-sufficient Ktunaxa economy; along with the communities, partners and neighbours, achieve sustainable economic growth through equitable access to economic resources and opportunities, while respecting Ktunaxa culture and values.
- Director of the Economic Investment Sector Position Description (2016). The description includes: The Economic Sector strives for maximizing Ktunaxa employment and achieving self-sufficiency, through promotion of meaningful careers, establishment of a diversified economy in which Ktunaxa entrepreneurs play a major role, and establishing an autonomous funding base for the operation of the Ktunaxa Government.

ʔakisq’nuk Economic and Community Plans

- Comprehensive community plan, 2010 draft (the plan has not yet formally been adopted by Council). The draft plan addressed key sectors of the community such as Governance, Lands and Resources, Economy, Infrastructure and Services, Housing, Education, Health, Social Development and Traditional Knowledge and Language.
- 5-Year Economic Development Strategy 2013 draft.
- Economic Development Officer: currently on staff and working on completing the comprehensive community planning process.

ʔaq’am Economic and Community Plans

- Community Strategic Plan, Ka Kniłwitiyała – Our Thinking (ratified by Chief and Council in 2011/12). This plan outlines a number of goals and objectives, organized by “tipi poles” that reflect the varying aspects of the community.
- ʔaq’am Community Enterprises (ACE) is the Community’s development corporation, established in 2013. The community development corporation’s Vision is to “generate a sustainable and self-sufficient economy by optimizing community and partner resources in a manner consistent with qanikɨ¢i (values and principles).

ʔakinǩ um‡asnuq‡iʔit (Tobacco Plains) Economic and Community Plans

- Tobacco Plains is currently initiating a Community Strategic Plan.
- A Community Economic Development Manager was hired in 2014

Yaqan Nukiy (Lower Kootenay Band) Economic and Community Plans

- yaqan nuʔkiy currently has an Economic Sector that works independently as well as with the KNC Economic Sector and an Economic Sector Strategy. yaqan nuʔkiy's Economic Sector Mission is "To create wealth and a stable economic environment for the Lower Kootenay Band while providing business, employment and training opportunities for members of the community". yaqan nuʔkiy provides access to economic development grants for Ktunaxa citizens interested in starting a small business.
- Lower Kootenay Development Limited Partnership (LKDLP) is one of yaqan nuʔkiy's business entities. The primary focus of LKDLP is agriculture, forestry, clean energy, tourism and agri-health.

Baseline Profile - Business Development and Procurement

KNC values resource management and economic opportunities for their community citizens within their Traditional Territory. The development of a strong group of Ktunaxa businesses and an entrepreneurial culture is central to both Ktunaxa nation rebuilding and the development of a self-sufficient and locally based economy.

Each of the Ktunaxa Bands has either established a development corporation or is in the process of doing so. In addition, there are a growing number of Ktunaxa citizen-owned small businesses. A number of joint ventures between established companies and Nation businesses are also emerging; these ventures allow those Nation businesses to bid on larger contracts that would otherwise be beyond reach for the Ktunaxa due to capital and other capacity issues.

The Ktunaxa are engaged in a range of economic and business development. Collective Ktunaxa business structures include Ktunaxa Holdings Ltd. General Partnership (KHL), Ktunaxa Holdings Ltd. Limited Partnership, and Nupqu Development Corporation as well as Flexinet and St. Eugene's Mission Resort and Casino.

- The Bands are shareholders and Limited Partners of Ktunaxa Holdings Limited Partnership (KHLP), and are represented by the Chiefs & Councils of each Community. The KNC Society is also a shareholder and Limited Partner.
- The Nupqu Development Corporation (Nupqu) (formerly the Ktunaxa Kinbasket Development Corporation), started in the 1990s by what was then known as the Ktunaxa Kinbasket Tribal Council. Nupqu Development Corporation was established by the General Partner (KHL) on behalf of the Limited Partners (KHLP) to pursue "forestry-related economic activities within and around the Ktunaxa Territory." Nupqu Development Corporation is the General Partner which oversees the operations of the Nupqu Development Limited Partnership.

- FlexiNET Broadband Inc. is a company solely owned by the KNC, which operates the Ktunaxa Nation Broadband network.
- SEM Holdings Ltd. is the corporation which holds the interest of the 4 KNC Communities plus the interest of Shuswap Indian Band in the St. Eugene Mission Resort Limited Partnership. The Limited Partnership that oversees the operations of St. Eugene Mission Resort is between SEM Holdings Ltd., Samson Cree Nation and the Chippewas of Rama First Nation. St. Eugene's is a significant employer in the Regional District of East Kootenay (RDEK) and has a relatively high percentage of Indigenous Peoples in its workforce.
- The Nation also has a number of individual, Nation and Band-owned businesses, including the Tipi Mountain (privately owned).

The Nation is also encouraging entrepreneurial enterprises by individual citizens. There is limited data on self-employment rates. However, regional data indicate that there are notable and persistent gaps in the rates of self-employment for Ktunaxa citizens. Aboriginal self-employment rates in the region[3] were 11.3 per cent, lower than the regional average of 16.9 per cent (Statistics Canada 2011).

BC Hydro Aboriginal Procurement Policy status and Ktunaxa interests

Section 5.1.1.2 (Economic Development) describes BC Hydro's Aboriginal Contract and Procurement Policy as follows:

> *The policy includes a commitment to increasing Aboriginal participation in providing its goods and services.*
>
> *The use of several procurement practices to increase the involvement of Aboriginal people in economic opportunities associated with the business of the organization are provided for in this policy, and include:*
>
> - *Capacity building initiatives, where BC Hydro provides funding or resources to provide training, improve skills, or increase business capacity in Aboriginal businesses;*
> - *Directed Aboriginal procurement, such as set-asides, restricted tendering, and single-source negotiations;*
> - *Aboriginal content evaluation criteria in procurement packages; and*
> - *An Aboriginal Business Directory, which is web accessible to suppliers and contractors.*

This policy, while important for increasing overall First Nations engagement, is not specific to locally affected Indigenous Peoples and will not be adequate for meeting the need of ensuring participation of Ktunaxa citizens.

BC Hydro is updating the Aboriginal Procurement Policy in fall of 2016. The following changes to key elements of the policy are being proposed by BC Hydro (BC Hydro 2016).

[3] The Province of British Columbia divides geographic regions in different ways and by different names according to the information being sought. In this case, the Rockies College Region is effectively identical to the RDEK.

- Aboriginal Business Definition – 51% ownership by Aboriginal Person(s). Concerns reported by BC Hydro: lack of flexibility, increased cost, and inconsistently applied. BC Hydro proposed change: First Nations decide to either self-perform work or work with their own business partner(s). BC Hydro is not concerned with how business is arranged; but will monitor to ensure adherence to laws and standards of conduct.
- Aboriginal Inclusion Weighting - 5%. Concerns stated by BC Hydro: not consistently resulting in opportunities; and cost competitiveness. Provision to be replaced by embedding requirements into contracts about how BC Hydro expects contractors to engage, e.g. set asides.
- Directed Procurement – direct awards, set asides or select tenders. Concerns stated by BC Hydro: lack of clarity, and cost competitiveness. Direct Awards will no longer be issued to an Aboriginal Business for being defined as an Aboriginal Business but instead will only be used to satisfy agreement commitments with specific groups; Directed Awarded contracts will be used to offset commitments to existing agreements with First Nations. Corporate Direct Award policy unchanged: there will continue to be directed procurements under our Corporate Procurement Policy for all other DA contracts. Must be cost competitive.

The goal of the revised procurement policy is stated to be: “To offer more directed procurement opportunities through our agreements.” The guiding principles are: 1. Cost-competitiveness (contracts must be market competitive), and 2. standards and requirements (contracts must meet our requirements, qualifications and performance expectations).

The Ktunaxa have raised concerns with the direction on procurement including the following:

- The policy should apply to directly affected rights-holding First Nations (i.e. those whose territory the project is in), rather than selected First Nations, currently being interpreted by BC Hydro as those with whom there is an existing agreement.
- Ktunaxa requires capacity funding support to enable the Nation’s strategic involvement and planning around the capital plan with an intention to support education and training to maximise the value of directed procurement opportunities.
- BC Hydro needs to consider ‘fair market values’ as opposed to Fair Market Pricing to allow for greater flexibility for First Nation partnerships with proponents. BC Hydro should be saying ‘market values’ (cultural, social, not just financial) as opposed to ‘market value.’
- The Ktunaxa Nation has a governance role in deciding what kinds of industries are welcome within Ktunaxa lands and waters. As such, BC Hydro’s approach has implications as an Industrial Procurement Policy, not just an Aboriginal Procurement Policy. It must work for both sides.
- Get rid of the Aboriginal Business Directory – it is out dated and Ktunaxa receives calls about contractors in their region pulled from the directory and many times the information is incorrect.

Despite the Aboriginal procurement strategy and emphasis on business and economic development, historically very little of BC Hydro’s procurement has been awarded to Ktunaxa-based businesses. Given that Ktunaxa is a rights holding Nation in the Project area, proportionate employment and business engagement should be expected to be at least equal to presence in the regional population. Maximizing

the participation of Ktunaxa businesses hinges on the ability to provide the goods and services needed by the Project. Economic opportunities related to the Project include BC Hydro's renewal of its existing work force following retirement across BC Hydro facilities. Ktunaxa citizens report that the historically Ktunaxa-owned businesses have found it hard to gain procurement from BC Hydro.

Barriers to increased business engagement by Ktunaxa citizens identified through qualitative work include:

- stringent on-site requirements, which are prohibitive for many small businesses;
- difficulty in accessing start-up capital and limitations due to lack of credit history, low level of savings linked to persistent poverty, or lack of collateral to secure loans;
- capacity limitations related to business development, bookkeeping, remittance procedures, and cash management;
- the small size and uncertainty of the local market; and
- capital limitations at the local community level.

C4.2 Anticipated Project Effects - Economic Investment

Experience with BC Hydro projects and current BC Hydro policies to date indicate a high risk that Ktunaxa businesses will be excluded from the economic benefits of the project. Ktunaxa have raised concerns that the Aboriginal procurement policy as drafted and revisions as discussed with the Ktunaxa are not adequate provisions to ensure appropriate access for Ktunaxa businesses to procurement. Absent the full implementation of the mitigations below to increase procurement, the relatively low level of Aboriginal procurement in prior BC Hydro projects can be expected to continue, exacerbating inequalities within the region. Chapter C5 describes the larger social and economic costs of inequality.

Based on past Ktunaxa experience with BC Hydro, and absent substantial efforts to change historic and ongoing trends of exclusion, the Project is expected to continue and intensify negative interactions with the rights-based economy and with business development and procurement. Without substantial change and effort secured through an IMBA or similar agreement, the Project is anticipated to continue to impact the Ktunaxa rights based economy through impacts to lands and waters and continued extraction of value from water resources based on colonial relationships that continued a Crown-enabled exclusion of the Ktunaxa Nation from direct benefit. Absent adequate mitigation, the Project effects on Ktunaxa business and procurement can be expected to be negative and moderate to low magnitude effects on economic investment, as the Project would likely continue the pattern set by previous BC Hydro projects: maintaining or intensifying economic disparities between Ktunaxa and non-Ktunaxa in the region. Given the already vulnerable economic status of many Ktunaxa citizens, such Project economic effects are likely to be significant.

Summary table: Project interactions Economic Investment

Project Phase	Project Activities	Nature of Interaction and Effect
Construction and Operations	Extraction of resource value, environmental impacts on traditional resource access and use, procurement, employment	Rights Based Economy - Intensification of negative effects caused by the Revelstoke dam on land and resource use and access by the Ktunaxa. The use of a valuable resource from the Ktunaxa ʔamakʔis may be positive or negative depending whether there is adequate recognition of and compensation for Aboriginal rights.
	Procurement of materials, goods and services	Procurement If access is facilitated, and business is long term, effects could be positive for self-determination, self-sufficiency, employment, economic security, business capacity and entrepreneurship. If Ktunaxa businesses are excluded, effects would be negative across the same set of indicators. If the business access is positive but the procurement is short term, and only in lower skilled work, there would be negative interactions in the long term.
	Payment of grants in-lieu-of taxes and of taxes	Local Government Finances Potential change in revenues for local First Nations governments due to Project associated revenue. Change in local government expenditures due to Project needs in terms of social, educational and training programs and services or other Project costs.

C4.3 Mitigations Economic Investment

See Section C11 for mitigations.

C4.4 Residual Effects- Economic Investment Sector

Table C4-2 provides a characterization of anticipated Project effects on Ktunaxa economic rights, title, and interests, assuming that mitigations and actions recommended in section C11 are fully implemented and successful.

Even with mitigations, the impacts on the rights based economy are considered to be negative. For more detail on the implications for rights based economic activities, see sections C2, C3 and C7.

Assuming that adequate mitigations and other measures and actions recommended in C11 are in place and successful, the Project can be expected to result in low magnitude overall positive economic gains for Ktunaxa citizens through business development. These economic gains are likely to be significant for Ktunaxa citizens directly engaged in contracting and business relationships, and potentially overall significant for the Nation depending on implementation.

Table C4-2 Economic Sector Summary of Characterization of Residual Project Effects

Valued Components	Magnitude	Direction	Geographic Extent	Duration	Frequency	Reversibility	Probability	Context
Rights Based economy	low	negative	regional	long	high	no	high	Vulnerable/ Medium confidence
Business development (procurement)	low	positive	regional	long	high	yes	high	Vulnerable/ medium confidence

C5 KTUNAXA RIGHTS: EDUCATION AND EMPLOYMENT SECTOR AND SOCIAL SECTOR

This section summarizes current understandings of Ktunaxa rights, title, and interests related to education and employment that have the potential to be affected by the Project, for better (benefits) or worse (adverse effects). The key objectives of the Education and Employment Sector are to build individual capacity through increasing access to education and training opportunities for Ktunaxa, wherever they live, to support increased participation in meaningful employment.

For the purpose of this section, two VCs related to this sector have been identified by KNC:

- education and training; and
- employment.

The Education and Employment Sector Council is one of the five governing Councils of KNC represented by one Chief or Council member from each of the four Ktunaxa Communities. It is mandated to work towards the Ktunaxa Nation's vision of strong, healthy citizens and communities and self-sufficiency through Education, Employment and Training: "We envision a Ktunaxa society in which there are ample healthy, social, cultural, recreational and economic opportunities for people of all ages and all capacities." Education and Employment Sector decisions are made from a Ktunaxa Nation perspective, taking into account the needs of the entire Ktunaxa Nation rather than those of any single jurisdiction, community, interest, organization or individual (Education and Employment Sector Charter 2015).

Goals related to this sector include:

- building capacity in both individuals and Communities through education and training;
- increasing meaningful sustainable employment for Ktunaxa Citizens;
- reducing barriers to employment, training and education;
- increasing educational resources and academic achievement for Ktunaxa Citizens;
- building employment and entrepreneurial skills and opportunities through training, apprenticeship, mentorship and partnerships;
- connecting lands and resources to education and employment as well as stewardship; and
- developing training and education programs that are culturally appropriate and offer a diversity of learning pathways including experiential learning.

In terms of Ktunaxa education and employment, the current baseline is an already heavily impacted one. Land based impacts from hydro, logging, mining, and other industrial and settlement activity in the territory as well as the establishment of the reserve system, among other systemic factors, created an unequal playing field for non-Indigenous and Indigenous populations in the region (see section C8 Ktunaxa Perspectives on Cumulative Effects). This has historically translated into unequal access for Ktunaxa citizens to education and employment, and resulted in a notable gap in education and employment levels between Ktunaxa citizens and the non-indigenous population within Ktunaxa ʔamakʔis.

In this context, the proposed Project needs to be evaluated in the context of the current baseline and impact on KNC's goals and preferred future education and employment activity. For the purposes of this assessment, specific KNC goals and measures related to the Education and Employment sector include:

- that Ktunaxa citizens should enjoy a standard of living comparable to that of the non-Indigenous population living in the Ktunaxa ʔamakʔis;
- that access to Project and broader employment opportunities within all levels of BC Hydro construction and operations is important;
- that Ktunaxa Citizens are committed to living and working in the Ktunaxa ʔamakʔis with prosperous local jobs;
- that there should be employment that contributes positively to quality of life: jobs need to fulfill personal growth, be economically valuable, and also culturally appropriate; and
- that there should be increased Ktunaxa citizen participation in the employment and economic aspects of development within Ktunaxa ʔamakʔis, including:
    - maximizing the engagement of the comparatively young Ktunaxa demographic in BC Hydro's workforce and succession planning; and
    - increasing Ktunaxa engagement in both direct and indirect BC Hydro employment.

As discussed in the following sections, despite equity hire provisions in previous BC Hydro projects in the area, KNC is not aware of any evidence that those efforts were successful or resulted in employment for Ktunaxa citizens. From a Ktunaxa perspective, past arrangements with BC Hydro have not worked. This section illustrates ongoing inequities in the distribution of economic benefits of development in the region, and the limited success of efforts to date to achieve higher Ktunaxa employment in BC Hydro's operations in Ktunaxa ʔamakʔis. Consequently, though education, training, and employment impacts and mitigations are important considerations in this environmental assessment, they are not the end goal. The primary Ktunaxa economic goal is: *increasing the standard of living among Ktunaxa citizens to a level comparable to that of their non-Native neighbours.* The Ktunaxa aim is, to the extent possible, and through a variety of mechanisms across the different indicators listed above as well as those in the social sector (Section C5) and other sectors, to focus the project benefits on this broader goal.

C5.1 Baseline Demographic Profile

The structure of the population in the Columbia Shuswap Regional District (CSRD) has shifted dramatically in the past few decades. This has been driven by two key trends: the aging of the population as more people move to the region for retirement, and a shift from primary to service sector work. The population has aged demonstrably, although the population has been growing in the region with in-migration mostly driven by retirement, the population in Revelstoke has remained relatively stable, changing little between 2011 and 2015.[1] The regional population has been a higher median age than

[1] BC Stats, population estimates, 2016. http://www.bcstats.gov.bc.ca/StatisticsBySubject/Demography/PopulationEstimates.aspx

provincial average while Revelstoke's population is close to the provincial median (Revelstoke: 40.3, BC: 41.9, CSRD: 48.1).[2]

The Ktunaxa have a younger demographic and a faster growing population than the region, although there is some indication that birthrate is declining and growth slowing. Although there is not adequate data on the median age of on and off reserve Ktunaxa citizens, the BC median age for the First Nations population was 28. Table C5-1 profiles some of the demographic, education, and employment characteristics of Ktunaxa communities compared to regional comparators. It illustrates a few key trends: the lower education completion rates for on reserve citizens, a relatively high labour force participation rate and a significantly higher unemployment rate for Ktunaxa citizens relative to the regional and provincial averages.

Table C5-1 includes 2011 Statistics Canada Census data for comparability with the regional and provincial averages. However, Statistics Canada data (employment and education data) for the individual First Nations is for on-reserve populations only. The Ktunaxa census data reflects both on and off reserve populations. It is important to note that the majority of Ktunaxa citizens live off reserve, indicating the ongoing challenge of outmigration. The education statistics in the table show decreasing education outcomes for on reserve populations which is a common phenomena associated with outmigration in Indigenous communities.

Table C5-1 Age, Education and Employment Indices

Ktunaxa Citizen First Nation	Median Age 2011 (2006)+	Labour Force Participation Rate 2011 (2006) %+	Unemployment Rate 2011 (2006) %+	High school or less education, age > 15 years 2011 (2006) %+
Akink'um?asnuq?i?it (Tobacco Plains Band- TOBACCO PLAINS 2)	45.0 (44.5)	70 (45.5)	28.6 (40.0)	66.6 (60)
?aqam (St. Mary's Band- KOOTENAY 1)	32.0 (32.3)	81.2 (69.2)	30.8 (22.2)	68.7 (57.6)
Yaqan nu?kiy (Lower Kootenay Band - CRESTON 1)	41.6 (26.5)	50 (68.8)	25 (18.2)	70.6 (58.8)
?akisq'nuk (Columbia Lake Band- COLUMBIA LAKE 3)	44.4 (34.5)	62.5 (72)	13.3 (22.2)	66.6 (60.0)

[2] CSRD stats are drawn from 2011 census profile. http://www12.statcan.gc.ca/census-recensement/2011/dp-pd/prof/details/page.cfm?Lang=E&Geo1=CD&Code1=5939&Geo2=PR&Code2=59&Data=Count&SearchText=shuswap&SearchType=Contains&SearchPR=01&B1=All&Custom=&TABID=1

Other	Median Age 2011	Labour Force Participation Rate 2011 %	Unemployment Rate 2011 %	High school or less education, age > 15 years 2011 %+
CSRD	55.6	58.6	11.6	48.7
CSRD Aboriginal Population	33.6	60.6	20.9	63
British Columbia	41.9	64.6	7.8	44.3
BC Aboriginal	28.9	62.4	16.4	60.2

Source: INAC 2013; Statistics Canada 2013, BC Stats 2016.

C5.1.1 BC Hydro demographics and workforce renewal

According to BC Business magazine, perhaps the top Human Resource challenge facing BC Hydro is the age of its workforce.[3] According to a 2013 B.C. Utilities Commission report, approximately one-third of current Hydro employees will be eligible to retire in the next five years. The number is even higher for line technicians, at 38 per cent, and dam and power station technologists, at 43 per cent. With planning and implementation of effective and relevant training, the impact of looming retirements within the BC Hydro workforce could be mediated through opening employment opportunities for Ktunaxa workers already resident in Ktunaxa ʔamakʔis.

C5.2 Education and Training

The following includes the baseline, Project effects, mitigations and residual effects assessment for the Ktunaxa VC of education and training.

C5.2.1 Education Baseline

Typical measures of educational attainment and success are not aligned particularly well with Indigenous Peoples' values and culture (Canadian Council on Learning 2009). With respect to indicators of learning outcomes, there is a gap between Indigenous perspectives and government reporting frameworks. Though current indicators are an important measure of the ability of Indigenous Peoples to engage in the resource economy and adapt to effects on their traditional livelihoods, these will have significant limitations for creating strategies and policies.

While basic education statistics are improving for Canada's Indigenous population, there remains a significant education gap with non-Indigenous populations across Canada, particularly for those on reserve. Although high school and post-secondary completion rates are still lower than the regional and provincial averages, Indigenous peoples' trade certifications and diplomas are starting to rival and in some cases exceed those of non-Indigenous people on a proportional basis.

Ktunaxa citizens follow this trend, with lower formal education levels compared to the non-Aboriginal population. Ktunaxa have slightly higher high school level education than the BC Aboriginal average, but are close to the BC Aboriginal average for post-secondary. The per cent of Ktunaxa citizens (on and off

[3] See: "Considering a new trade? BC Hydro will need a lot of workers very soon." BC Business, June 24, 2015. http://www.bcbusiness.ca/considering-a-new-trade-bc-hydro-will-need-a-lot-of-workers-very-soon

reserve) with a high school equivalency or below is as follows: 25% have a dogwood, 16% have high school equivalency while another 9.6% have a leaving certificate, for a total of 52% with high school equivalency or below (KNC Census 2010). A total of 31% of Ktunaxa citizens (+15) who responded in the KNC census have some post-secondary including: 18.6% with a college certificate, 7.4% with a college diploma, 3.8% have a degree 1.4 % have master's degrees. This is well below the regional and BC average for non-Aboriginal educational completion levels and will create notable disadvantages for Ktunaxa citizens in accessing training and employment. In the region (CSRD), 28.8% of the working aged population (+15) has high school equivalency while 51.2 have post secondary (a certificate, diploma or degree).

Lower education completions rates are tied to higher unemployment, but higher education levels do not erase the gap. With respect to returns on education, a recent report on Aboriginal Income Disparity (Indigenous and Northern Affairs Canada 2013) concluded that "even highly educated Aboriginal people face a considerable income gap relative to their British-origin counterparts." In 2005, non-Aboriginal people aged 25 to 54 with a Bachelor's degree or higher had an average employment income of $63,957, compared to $50,569 for First Nations people (BC Stats 2009). The gaps are even larger for the on-reserve First Nations population, indicating a broader range of challenges. While the employment rate of non-Indigenous people without a high school diploma was 35 per cent in 2011, the rate for on-reserve Indigenous Peoples with the same educational status was 25 per cent (Statistics Canada 2013).

ʔaqam (St. Mary's), yaqan nuʔkiy (Lower Kootenay) and ʔakisqʼnuk (Columbia Lake) have K–6 schools that include Aboriginal programming alongside the provincial curriculum. This is important for the future of Ktunaxa education because Aboriginal-run education programs have been shown to have higher success rates for Aboriginal students than mainstream schools. However, the Ktunaxa have neither the population base nor the resources to offer high school at this time, and all Grade 7-12 students must go to schools in non-Aboriginal communities, some of which are located in the US (i.e., students from Tobacco Plains attend high school in Montana). The Ktunaxa Adult Basic Education Program has been discontinued due to a shortage of funding.

Training, drivers' licensing and workforce certificates

BC Business Magazine (2015) reported that, in recent years, B.C. has lagged at turning trainee apprentices into qualified tradespeople. This is reportedly due to a 2004 shakeup of B.C.'s apprenticeship programs, which made employers responsible for a bigger share of training. The percentage of apprentices who went on to join the workforce fell from 53 per cent in 1995 to 34 per cent in 2013. BC Hydro launched its own trades school in 2013 with a budget of $20 million for the new Trades and Technical Training School in Surrey to train around a hundred new recruits a year, in addition to the roughly 400 apprentices already on payroll.

According to the Ktunaxa Census (2010), 12% of adults reported having a trade certificate, 4% indicated that they had a journeyman designation and 2% had a Red Seal designation in a trade. This means there are citizens with the training and certifications preferred by the resource sector for employment. This reinforces the Ktunaxa concern that part of the challenge in accessing employment is not lack of training but continuity and length of employment experience (see employment section C6 for more discussion).

Ktunaxa trades training levels are below the regional average, meaning that there are significant opportunities for additional trades training. However, the location of the BC Hydro training centre in the lower mainland can present barriers to access for Ktunaxa citizens. To facilitate access, training should be organized with local providers where possible (i.e. College of the Rockies).

As stated at the beginning of this section, the Ktunaxa vision is for the increase in well-being of all Ktunaxa citizens. BC Hydro's ongoing operations need to contribute to this overarching goal. A key component to this will be making broader capacity and training funds available from BC Hydro so that the long-term employment needs of both Ktunaxa and BC Hydro can be achieved.

The Ktunaxa census identifies a range of barriers to education and training for Ktunaxa citizens. This includes lack of access to adequate funding (financial issues), family obligations, and others. Ktunaxa citizens also report multiple barriers to accessing and completing training (i.e., location of the training and distance from community, lack of driver's license, testing anxiety, job readiness) (KNC 2009; Phillips 2013). Lack of follow-up between training and work is also an issue, as citizens report attending training programs but then failing to get work or stay employed (Phillips 2013).

According to the 2009 Ktunaxa census, 50 per cent of those 16 years of age or older and residing on reserve do not have a driver's license. The off-reserve population is slightly lower, with only 40 per cent not having a driver's license. The barriers to obtaining a driver's license include: lack of access to a vehicle and instruction due to socioeconomic issues of poverty and broken families, lack of access to a local graduated license program and lack of funds to support accessing professional training due to government mandate, and the issues of lost licenses and subsequent fines.

This lower status in mainstream education and training translates into lower engagement in the wage economy (higher unemployment rates, lower participation rates), lower average wages for workers, slower advancement rates within the wage economy, higher reliance on social assistance, and other adverse economic outcomes. This is evident in the food security findings from the 2013 Ktunaxa Diet Study, with 40 per cent of households reporting being food insecure despite wages being their main income (Fediuk et al. 2015).

C5.2.2 Project Effects - Education

The differential access to education and training opportunities for Ktunaxa citizens described above mean that, should the Project proceed, the Ktunaxa would be at a significant disadvantage for accessing training and employment opportunities in comparison with both non-Aboriginal residents of the CSRD and other non-Aboriginal British Columbians and Canadians in general. Thus, absent adequate mitigation, the Project is likely to perpetuate and/or exacerbate existing inequalities between Ktunaxa citizens and the regional non-Aboriginal population.

Looming retirements within the BC Hydro workforce could open up employment opportunities for the Ktunaxa. However, for the most part, those opportunities would remain out of reach unless there are fundamental improvements, in short order, to the accessibility of job-ready education and training opportunities as well as hiring practices. The experience of retiring workers is not easily replaced by new workers, and training and capacity development will require significant investment. Given the expected shortage of experienced workers, now is likely an ideal time for BC Hydro to invest heavily in order to prepare, onboard, engage, train, and retain a new generation of Ktunaxa citizens.

Absent mitigations, the Project effects on Ktunaxa education and training can be expected to be negative and of low magnitude, as the Project would likely continue the pattern set by previous BC Hydro projects and maintain or intensify economic disparities between Ktunaxa and non-Ktunaxa in the region.

C5.2.3 Mitigations – Education and Training

See Section C11 for mitigations.

C5.2.4 Residual Effects Education

Assuming adequate mitigations and other measures and actions recommended are in place and successful, the Project can be expected to result in low magnitude positive economic gains for Ktunaxa citizens through education and training. These economic gains may be significant for Ktunaxa citizens directly engaged in training, education and employment initiatives. See Table C5-2 for characterization of anticipated residual Education effects.

C5.3 Employment

The following includes the baseline, Project effects, mitigations and residual effects assessment for the Ktunaxa VC Employment.

C5.3.1 Employment Baseline

The 2009 Ktunaxa Census data (on and off reserve citizens) indicate that only 51 per cent of working age (18 to 65) citizens were in paid employment (Phillips 2010). Table C5-1 shows unemployment rates on reserve (for the years 2011 and 2006) for the different bands compared to the regional and province-wide numbers. Unemployment among the Ktunaxa bands (on and off reserve) is many times the regional rate, ranging from 13.3 to 28 per cent (21 per cent overall as per the Ktunaxa 2009 Census and higher for on reserve populations). These numbers would be higher with under-employment and seasonal work included but accurate figures are not available.

BC Hydro will have to deal with a number of workforce issues brought on by high retirement rates combined with an aging demographic and a shortfall in the available supply of workers in the region. It appears clear that tapping into Ktunaxa citizens, particularly young people, as a source of employment is an opportunity both for BC Hydro and the Ktunaxa.

One of the key potential beneficial attributes of BC Hydro is the employment and associated high wage income it provides. However, Ktunaxa citizens have had a difficult time entering into and securing full-time equivalent employment with BC Hydro over the years, either through direct employment or working for subcontractors.

As of October 2015, according to the KNC's Education and Employment Sector, there were no Ktunaxa workers employed in Revelstoke BC Hydro operations, and no Ktunaxa citizens were hired for the Revelstoke 5 project construction phase, although there was Ktunaxa employment in the Mica construction project. In 2015, BC Hydro had a workforce of 6,312 across the province. The Revelstoke 5 project had a workforce of approximately 816 workers, of which 4 were Aboriginal (less than .05%). Data was not provided on how many were locally affected First Nations (see from equity hire data in section 5.2.2.2 Table 5-4). In 2011, 5.8 per cent (2,485) of the CSRD total population and 5.1 per cent (305 persons) of the Revelstoke population self-identified as an Indigenous person. Just to be representative

of the Indigenous population in the region, the Revelstoke 5 project would need to have employed at least 47 local Indigenous workers. This target needs to be higher to reflect rights holding Frist Nations and affected First Nations including the Ktunaxa with citizens outside of the region. The Mica Dam project achieved little better with 8 Indigenous people hired out of 838 employees (just under 1%). Data on locally affected First Nations hire rates was not available at the time of drafting this report.

These persistently low hire rates of Indigenous workers are despite the existence of programs focused on advancing Indigenous and equity hires.[4]

The Waneta Dam expansion project by Columbia Power is a case study of Ktunaxa engagement that had quite different results. The project employed a KNC staff person of First Nations descent as a First Nations Liaison and was able to achieve over five per cent employment of Indigenous people over the life of the project, with a total of 31 Ktunaxa workers in direct employment over the construction phase (Eunson 2015). There were successful apprenticeship placements and one of the Ktunaxa labourers earned his way to become a supervisor on-site. Some factors in the success included:

- Resources and capacity were provided to KNC to support the function of a First Nations Liaison.
- Collaboration and alignment between the multiple parties (Waneta Expansion Power Corporation (WEPC) and Columbia Power Corporation and SNC-Lavalin Inc.), and building on previous relationships with the Columbia Power Corporation.
- Cooperation of the major contractor with the First Nations Liaison to match direct and indirect employment, procurement and contracting opportunities for Ktunaxa citizens and contractors.
- The use of the BladeRunner program, which offered Ktunaxa participants necessary skills and experience, supplemented by partnerships for local trades training in the region. Participants received certified health and safety training, life and job-readiness skills, marketable skills that enhance long-term employment prospects.
- Numerous engagements took place well in advance of the commencement of the Project between all the parties, including senior executives, trade unions and contractors, senior First Nation executives, Governors, and staff.
- 'Ktunaxa 101' sessions were provided to Project managers and supervisors to establishing and maintaining conducive employer/employee relationships in regards to First Nation employees. Later, cross cultural awareness sessions were facilitated on-site to all supervisors and managers on the Project offered on a quarterly basis; these sessions were facilitated by a Ktunaxa educator and not only provided background context and content, but insight into a progressive First Nation.
- The First Nations Liaison also attended the Construction Coordination meetings held on-site, with representatives from the Owners, Prime Contractor, sub-contractors and Project engineers held

[4] Installation of Revelstoke Generating Unit 6 is a named project under the Collective Labour Agreement between Columbia Hydro Constructors Ltd. and Allied Hydro Council of British Columbia (Columbia Hydro Constructors Ltd. and Allied Hydro Council of British Columbia 2008). This collective agreement sets out wages and working conditions, including local hiring provisions and the promotion of greater participation by Indigenous workers, women, and other equity provisions.

every fourth Thursdays of the month. There was a regular on site presence of the First Nations Liaison and early face-to-face contact with the contractors, sub-contractors and union Business Agents coming on-site to build relationships and leverage opportunities for Ktunaxa workers and contractors.

- Subcontractor buy-in including offering five day work experience programming on site for Ktunaxa citizens.

A range of challenges has been identified in the successful engagement of Ktunaxa citizens in resource projects. One of the key challenges that has been identified is the minimum qualifications in terms of experience, including a demonstrated positive work ethic and consistent work history. Cultural practices of harvesting can mean a more seasonal employment record for Ktunaxa citizens. Individuals with employment loyalty of 10+ years are preferentially hired over an individual with the same qualifications but a seasonal work history.

Other challenges identified by Ktunaxa citizens in accessing employment generally include (KNC 2010; Philips 2013; Dust 2015; Eunson 2015):

- Distance from the community;
- Lack of desire to work away from the community (perceived racism issues and cost of living concerns, and the loss of familial and community connections);
- Lack of adequate, affordable accommodations for those who do choose to work away from home;
- Workplace culture (interpersonal issue due to lack of culturally appropriate or sensitive environment, lack of clarity on work definitions/allocations/union context);
- Minimum education qualifications that include a high school diploma (lack of adequate recognition of 'equivalency' and informal skills/experience);
- Lack of a drivers licence;
- Certifications that are out of date or gaps in training/certification required, lack of access to adequate funding for necessary training/certifications;
- Conflict between the work and cultural values of land stewardship;
- Lack of adequate resources for work clothing and equipment (i.e. steel toed and rubber boots).
- The lack of success in securing employment in resource operations in Ktunaxa ʔamakʔis is perceived to be discouraging further applications; and
- Streaming into lower level work and barriers to career development.

Ktunaxa citizens are currently under-represented in BC Hydro. Despite long-term employment inequity and obvious education and training gaps, there is still no clear plan for prioritizing Ktunaxa citizens in the hiring process. There is a preferential interview process of those with Indigenous identity in the case of equal qualifications; however, no hard targets for minimal hiring of 'affected First Nations' have been established to date. The limited success in Indigenous and locally affected First Nations to date on BC Hydro operations demonstrates the need to identify a concrete target for Ktunaxa hires. The Ktunaxa consider the appropriate initial target to be a minimum of 10 FTE employees with the availability to

annually and incrementally increase that target as BC Hydro's employment openings match Ktunaxa's capacity development.

Overall, with a few clear exceptions, the current situation shows relatively low direct employment for Ktunaxa from existing resource extraction operations, and relatively few indirect benefits flowing to Ktunaxa businesses (see section C4), and little to no induced benefits from income spending in Ktunaxa communities as the labour force purchases most goods and services in primarily non-Indigenous communities.

This is unfortunate for a variety of reasons. First, the income associated with the resource sector is much higher than the income associated with other goods producing sectors or the services sector. Second, many of the jobs in the resource sector are a good match to the skills of the available and upcoming Indigenous workforce. Canada-wide, Indigenous people were more likely to work as trades and transport equipment operators as well as occupations unique to the primary industry than were non-Indigenous people in 2010 (Usalcas 2011). Third, the Ktunaxa goal of creating a real, self-sufficient economy, premised in large part on being able to take fair advantage of developments in Ktunaxa ʔamakʔis, requires that a greater proportion of the workforce in the resource sector come from the Ktunaxa population. Finally, the Ktunaxa, especially their younger people, need better access to jobs in general. In the Ktunaxa communities unemployment levels, especially among youth, are high, income levels are relatively low and economic diversification is limited.

C5.3.2 Project Effects – Employment

The proposed Project is an extension to the Revelstoke Dam. There are expected to be additional needs for employment during construction. Although there is not an increase in project specific operations employment anticipated, the substantive retirement of the broader workforce presents an opportunity for increased Ktunaxa engagement. BC Hydro is already making increased investment in training and education as part of the workforce renewal.

Absent mitigation, the Project can be expected to continue the pattern set by previous BC Hydro projects: contributing minimal benefits to Ktunaxa citizens by way of employment, and maintaining or intensifying economic disparities between Ktunaxa and non-Ktunaxa people.

Along with the beneficial effects of employment, and largely due to the distance of the Project from existing Ktunaxa communities, the following adverse impact outcomes are anticipated if increased engagement in employment is achieved:

- increased outmigration of Ktunaxa citizens from their home reserves, with attendant adverse impacts on the home community (e.g. out-migration and related population decline, decreased sense of community, increased cost of living, continued sub-standard housing on reserves, and potential for declining practice of subsistence economy, among others);
- increased racism encountered by Ktunaxa citizens outside their homes, including potentially both at the workplace and their new place of residence, which increases stress, mental health issues, and addictions risks; and

- potential for reduced personal or familial well-being, including reduced on-reserve social cohesion, and reduced access of workers to on-reserve cultural opportunities and social services.[5]

C5.3.3 Mitigations –Employment

See Section C11 for mitigations.

Residual Effects –Employment

Assuming adequate mitigations and other measures and actions recommended in C11 are in place and successful, the Project can be expected to result in low magnitude overall positive economic gains for Ktunaxa citizens through employment. These economic gains are likely to be significant for Ktunaxa citizens directly engaged in direct and indirect employment, but low magnitude relative to the anticipated potential residual effects on the subsistence economy addressed in section C3. See Table C.4.1-2 for the summary of economic sector residual effects.

C5.4 Characterization of Education and Employment Sector Residual Project Effects Assessment

Table C5-2 provides a characterization of anticipated Project effects on Ktunaxa economic rights, title, and interests, assuming that mitigations and actions recommended in section C11 are fully implemented and successful.

Table C5-2 Education and Employment Sector Summary of Characterization of Residual Project Effects

Valued Components	Magnitude	Direction	Geographic Extent	Duration	Frequency	Reversibility	Probability	Context
Training and education	low	positive	regional	long	high	yes	high	Vulnerable/ medium confidence
Employment	low	positive	regional	long	high	yes	high	Vulnerable/ medium confidence

Assuming mitigations and other measures and actions recommended in this section and C11 are fully implemented and successful, the Project can be expected to result in low magnitude positive employment gains for Ktunaxa citizens through direct and indirect jobs, training and education. The duration of the positive effect would be long assuming employment targets are maintained. These gains are likely to be positive and significant for Ktunaxa citizens employed with BC Hydro, and positive and potentially significant at the level of the Nation, depending on implementation.

[5] For more discussion of these potential adverse outcomes, see Section C2.2.3 on Housing, Transportation, and Social Services.

C6 KTUNAXA RIGHTS: EDUCATION AND EMPLOYMENT SECTOR AND SOCIAL SECTOR

This section outlines the potential effects of the Project on Ktunaxa rights and interests related to the social sector, including health, social services, housing, and transportation. Valued components considered in this section include:

- housing, transportation and social services; and
- ecological approach to human health, including confidence in wild foods.

The Social Sector is one of the five key pillars of the Ktunaxa Nation Council (KNC). The Social Sector's objective is to create and maintain vital health and wellbeing systems that are integrated, culturally grounded, easily accessed, and oriented to achieving this goal.[1] From the Ktunaxa perspective, the health and social well-being of Ktunaxa citizens are intrinsically related to the vitality of their language and culture, as well as to the Nation's self-sufficiency and self-determination. These are key social determinants of health for Indigenous Peoples. Thus, a holistic approach needs to be taken in assessing health and social impacts, with consideration given to overlap with other related sections including land use (C7), traditional knowledge and language (C3), education and employment (C5) and economic investment (C4).

For the purpose of this assessment, Ktunaxa goals related to health, housing, transportation and social services are identified as:

- access to affordable and appropriate housing for all Ktunaxa citizens, both on reserve and off reserve;
- maximization of the number of Ktunaxa residing on a home reserve or on reserve in general;
- access to safe, affordable transportation;
- engagement, establishment, and implementation of relevant community-based healthcare and social services throughout Ktunaxa ʔamakʔis that reflect the unique strengths and challenges of all communities served, and by building capacity within the Aboriginal community (KNC 2011);
- access to culturally appropriate, timely and valuable social services for Ktunaxa citizens, regardless of their place of residence; and
- improved health and well-being for all Aboriginal People living on Ktunaxa ʔamakʔis, including health equity and the right to traditional food and food security (financial and physical access to culturally appropriate safe and nutritious food in sufficient amounts).

Specific indicators (assessment endpoints) associated with the rights, title and interests of the Ktunaxa on these topics include:

[1] A more complete overview of the Ktunaxa Nation Council's Social Sector is available at http://www.ktunaxa.org/four-pillars/social-3/

- housing, including its availability (housing stock and starts), affordability (rental and purchase prices), quality, and appropriateness (need for major improvements, number of rooms per average residence);
- location of residence and percentage of Ktunaxa population living on home reserves;
- health status, including morbidity and mortality (life expectancy, suicide rate, infant mortality, rates of accident and violent death, workplace injury rates, disability rates), infectious and chronic disease rates (diabetes and cardiovascular disease), and physical wellness and lifestyle (smoking rates, addictions, counselling, obesity rates, subjective perception of health, birthrates and teen pregnancy rates);
- social determinants of health, including cultural continuity (language, participation in harvesting activities), income and food security, and social cohesion (family cohesion, crime rates); and
- transportation, i.e., the distance to worksites and available transportation options, traffic accidents, and road safety.

C6.1 Ktunaxa Social Sector: Baseline

This section describes general baseline conditions as well as key conditions specific to each of the valued components listed above.

As discussed in C1, the Ktunaxa demographics mirror national and provincial trends in Indigenous populations with a higher birthrate and younger population than the BC average, and like other First Nations, the Ktunaxa Nation struggles with outmigration. Over half of Ktunaxa citizens live off reserve.

Indigenous Peoples have amongst the lowest social and economic conditions in the province; they are disproportionately living in poverty and are overrepresented as victims of and perpetrators of crime, as well as in children in care (Statistics Canada 2013a; Reading and Wien 2009). On average approximately 40 per cent of First Nations experience food insecurity, a statistic mirrored by the Ktunaxa Nation, whose rate is 44 per cent (Fediuk et. al. 2015). There are also inequalities in economic and employment statistics (see Section C.4.1). Statistics in this report indicate that the Ktunaxa Nation has been closing the gap, but substantial inequities remain.

Today Ktunaxa citizens are a thriving people who are revitalizing their language and culture throughout their territory. The KNC is actively working towards a model of self-governance, and continues to build cooperative and positive relationships with regional, provincial, and federal governments.

Under the Social Sector pillar, there are many positive initiatives and successful programs that support Ktunaxa citizens.[2] This work engages with citizens both on and off reserve. In the urban setting, programs have improved the well-being of less fortunate Ktunaxa citizens and often provide pathways for people to reconnect with their families and return to their communities. However, in virtually every socio-economic indicator – per capita income, family and individual health, housing availability and standard, as well as

[2] For details of the programs and services that the Nation is engaged in under this pillar, see http://www.ktunaxa.org/fourpillars/social/index.html.

employment and education – the Ktunaxa experience falls short of the standards experienced by other regional or provincial residents.

C6.1.1 Ktunaxa Housing Baseline

Ktunaxa citizens face housing challenges both on reserve and off. The Nation is not unique; Canada has a nation-wide affordable housing crisis coupled with deep and pervasive homelessness disproportionately experienced by Indigenous people (Shapcott 2010).

Housing challenges being addressed by the Ktunaxa Nation also relate to the quality and conditions of the housing, as well as access issues including adequate stocks and affordability. This is the case for both off and on reserve populations. In 2010 KNC and community staff reported that housing was an issue in all the communities (personal communication, Debbie Whitehead). The traditional value of having extended families living together means that the solution is not necessarily just more housing, but also larger housing that can appropriately accommodate the cultural and community context.

In terms of condition of dwelling, in 2011, 21 per cent of British Columbia First Nations people lived in a home requiring major repairs compared to 7 per cent for the total population (Statistics Canada 2013b). In 2011, 45 per cent of ʔakisq'nuk (Columbia Lake Band), 43 per cent of ʔaq'am (St. Mary's Band), and 50 per cent of yaqan nuʔkiy (Lower Kootenay Band) houses on reserve required major repairs (BC Stats 2011).

Housing is a key social determinant of health; inadequate housing and crowding can be associated with a host of health problems. For example, mold growth can lead to respiratory and immune system complications. Crowded living conditions can lead to the transmission of infectious diseases such as tuberculosis and hepatitis A and can further increase risk of injury, mental health problems, family tensions, and violence.

This lack of housing access poses significant challenges for Ktunaxa citizens in terms of access to employment. Affordability problems are leading to Ktunaxa citizens living in crowded and inadequate housing situations.

C6.1.2 Ktunaxa Social Services Baseline

Ktunaxa families and communities have a long tradition of organizing themselves, and caring for the wellbeing of children, elders, and all citizens, according to Ktunaxa laws of respect and family relationship. While these traditions were challenged, and sometimes eroded as a result of the imposition of Canadian social services and related policies, the Ktunaxa Nation has developed a strong Social Sector as one of the five pillars of Nation Rebuilding. As part of KNC's move towards self-determination, the Ktunaxa/Kinbasket Child and Family Services (KKCFSS) was established in 1996 to transfer back the responsibilities of health and wellness from outside agencies. Since 2005 the KKCFSS has been delivering comprehensive child and family services to Indigenous people throughout Ktunaxa ʔamakʔis.

With direction from the KKCFSS, the focus for social programs has been re-oriented to individual and family wellness. However, there are challenges. The limitations of the available workforce on reserve mean that the Nation has to rely on non-citizens to fill positions. There are still significant challenges

related to inappropriate housing, mental health issues, and drug and alcohol abuse. Sexual abuse or other trauma-causing drug and alcohol issues also need to be better addressed.

Social services are under pressure in Revelstoke where workers will live, limiting access for Indigenous and non-Indigenous community citizens alike.

Quality affordable daycare is also an issue in all of the communities, especially due to shift-work schedules and the high cost of housing in Revelstoke and nearby communities.

Social services are also under pressure from issues of housing access that make it difficult to attract and retain staff. For lower wage employers and non-profit organizations, the lack of housing represents the single greatest constraint to them growing their business (Housing Strategies Inc. 2012).

C6.1.3 Ktunaxa Health Baseline

Oral histories and Ktunaxa Nation Council documents suggest that the first smallpox epidemic attacked Ktunaxa around 1780, arriving from the east through contact with Blackfoot or other plains groups. The population of the Ktunaxa Nation in the mid-18th century was thought to be up to or over 5,000. This was cut in half, and then halved again, through subsequent epidemics of smallpox, measles, influenza, and other introduced contagious diseases. As in other parts of the plateau, estimates of total mortality between the mid-18th century and the early-20th century due to contagious disease and other factors range up to 90 per cent.[3] Despite such devastation, the Ktunaxa maintained a strong continuity of identity, language, and land governance. Chamberlain (1892) notes that traditional practices including “sweat baths and others” have “good results” in terms of health. At the time of his brief visit, Chamberlain identified “consumption” as the illness from which the Ktunaxa suffered the most. More than half a century later, Baker (1955) indicates that “such diseases as smallpox, measles, tuberculosis, diphtheria, whooping cough, and tetanus ravaged the tribe.” In later years he reported tuberculosis had “disappeared... and that immunity was being established in regard to smallpox, diphtheria, whooping cough and tetanus.” He also noted that physicians had reported no record of cancer among Ktunaxa for fifty years.

A critical factor in the history of Ktunaxa health is the legacy of the residential schools (see Section C8 for Cumulative Effects). Across the Canadian Indigenous populations, there is evidence that this policy caused a deep, wide and overwhelmingly negative legacy that has contributed to ongoing social and health challenges for individuals, families, and communities, including disproportionately high mental health issues and addictions rates, and high rates of alcohol-related deaths, incarceration, and suicide (IHA 2003; Reading and Wein 2009; Chandler and Lalonde 2008). Accordingly, this legacy, combined with the weight of recent history in terms of both industrial development and colonialism, has contributed to the current disparities in socio-economic and health indicators between Indigenous and non-Indigenous peoples in the region. Communities consistently report that mental health and substance use are key challenges and that these feed other health and social issues such as Fetal Alcohol Syndrome (FAS). Chronic disease is also a priority. The communities also consistently report inadequate levels of

[3] The Plateau refers to a large region that includes southern interior of British Columbia and adjacent portions of the US.

appropriate services in those areas, particularly as some community members are not comfortable accessing mainstream health, particularly mental health, in their community.

C6.1.3.1 Direct Health Indicators

As illustrated in Table C6-1, persistent gaps continue to exist between the Indigenous and non-Indigenous population in BC. Indigenous Peoples continue to have a lower life expectancy, higher mortality rates and higher infant mortality (Office of the Provincial Health Officer 2012), and higher rates of chronic and infectious disease and mental health issues than the general population (Health Canada 2005). Life expectancy remains 6.4 years less for the Indigenous population, and the Age Standardized Mortality rate of 76.3 per 10,000 continues to be 1.67 times the rate for the non-Indigenous population. The infant mortality rate for the Indigenous population remains double the rate among the non-Indigenous population.

Perceptions of self-rated health are commonly used as one of the indicators for community well-being. Self-rated health is much lower among the Indigenous population in BC. Only 43.2 per cent of First Nations aged 12+ (39.5 per cent of First Nation adults aged 18+, falling to 19.9 per cent of adults aged 55+) living on reserve rated their health as excellent or very good (FNHA 2012, p.150). Nationally, lower rates were also reported among First Nations people living off reserve from 2007-2010 (49.9 per cent) compared to the non-Indigenous population (62.7 per cent).

In addition, limited resources, historic and current government policy, jurisdictional complexities, and cultural safety issues present additional challenges for improved health and wellness (FNHA 2014).

Table C6-1 Health Indicators in British Columbia for Status First Nations and Other Residents

Indicator	Time Period	Status Indians	Other Residents
Life Expectancy at Birth Five-Year Average	2006 to 2010	74.7	81.1
Age-Standardized Mortality Rate (expressed as a rate per 10,000 people)	2010	76.3	45.5
Youth Suicide Rate (per 10,000 people)	2006 to 2010	3.0	0.7
Infant Mortality Rate, Five-Year Aggregate (number of infants who die during first year of life, per 1,000 live births)	2006 to 2010	7.2	3.5
Diabetes, Age-Standardized Prevalence Rate, (expressed as a rate per 100),	2010/2011	8.0	5.8

Source: Provincial Health Officer's Special Report 2012. (See Interior Health Authority for a more detailed summary of the inequality of health for a broad range of health and disease indicators, IHA 2010).

As a recent step towards improving health and self-determination, First Nations in the BC Interior, the First Nations Health Authority, and the Interior Health Authority created the Interim Interior Regional Health and Wellness Plan (IRHWP) (June 2014) (See FNHA 2014) which followed the Interior Partnership Accord, signed on Nov. 14, 2012 (FNHC and IHA 2012). KNC priorities within the IRHWP include: relationship building, resource and capacity development, improved access, health programs and services, mental or emotional health, youth and elder services, social determinants of health (focus on increasing education and skill development, economic development), community wellness and revitalization of traditional knowledge and language, and Indigenous urban services.

C6.1.3.2 Indirect Health Indicators: Food Security and Confidence in Wild Foods

Food security is a critical social determinant of health. Food security exists when all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life (Food and Agricultural Organization, 2002).

Food security in Canada is commonly measured in terms of economic access. As such this indicator can be used to measure likelihood of nutrition/health risk and financial stress as it includes any experiences of insecurity in the previous 12 months (Loopstra 2013). Food security is an important issue in BC First Nations communities. According to a survey of 21 BC First Nations (Chan et. al. 2011), 41 per cent of on reserve First Nation households are classified as food insecure. The Ktunaxa diet study classified 44% of Ktunaxa households as food insecure, including 33% moderately food insecure, meaning that, in the last 12 months, these households relied on lower quality/less expensive foods and/or experienced a compromise in the quantity of food consumed, and 11% severely food insecure indicating that families regularly experienced market food shortages including skipping meals or not eating for a whole day. In comparison, food insecurity in the general BC and Canadian population sits at 8.3%, according to the Canadian Community Health Survey (CCHS) (2011-2012), and higher than the 23.1% among Indigenous households on reserve reported by Tarasuk et al. (2014) in their report on Household food insecurity in Canada.

Food insecurity results in a poorer quality diet, and greater risk of micronutrient deficiencies and obesity (Rutten et al. 2012). The First Nations Food, Nutrition and Environment Study (FNFNES) reported that the diet of many First Nation adults is inadequate to meet nutrient needs. Those eating traditional foods on a regular basis are more likely to have a nutritionally adequate diet than those who rely exclusively on market foods (Chan et al. 2011). With healthy foods beyond the reach for many First Nations households, there are greater risks of health inequities and micronutrient deficiencies, obesity, diabetes, and heart disease.

More than twice as many BC First Nation adults on reserve are obese (40 per cent) compared to 18 per cent of the non-Indigenous population (Statistics Canada 2009-2010 cited in FNHA 2012). Obesity is a major risk factor for diabetes and heart disease. Cardiovascular disease is the leading cause of death among First Nations in BC (Provincial Health Officer's Special Report, 2012) and diabetes rates for First Nations in BC sit at 8 per cent compared to 5.8 per cent for the general population. In BC the monthly cost of feeding a family of four is $914 (PHSA 2014). A family on income assistance or disability assistance cannot access basic food needs.

Any discussions of health and food security must acknowledge the important links between Ktunaxa health and land use that are maintained through the practice of hunting, fishing, and gathering wild foods in preferred harvesting locations. In a population highly vulnerable to health inequities, nutrient deficiencies and food insecurity, the traditional food system is a key component to better health. Results of the Ktunaxa Diet Study (Fediuk et. al 2013), discussed in greater detail in section C3, indicate that harvesting traditional foods is common practice within Ktunaxa households. The study also indicates that the sharing of traditional food between households is widespread. While 52 per cent of households reported hunting, over 90 per cent of households reported eating game meats harvested in Ktunaxa ʔamakʔis in the past year. Similarly, 68 per cent of households harvested berries, while 83 per cent reported consuming berries.

Both the diet study and responses from Ktunaxa elders and land users indicate that cumulative effects have already resulted in adverse effects on confidence in water quality and wild foods, particularly fish, for at least some Ktunaxa citizens. In the survey, 62 per cent of households stated that they had concerns about the safety of traditional food. Ktunaxa citizens reported food safety concerns for fish and berries amongst other harvested foods, with fish being the most avoided food (Fediuk et. al. 2013).

Ktunaxa citizens have voiced concerns related to the contamination of fish and other wild foods in relation to the proposed Project and the cumulative impacts of the Revelstoke Dam. Specifically, Ktunaxa citizens expressed concern with methyl-mercury bioaccumulated in fish in the Columbia River system upstream and downstream of the dam linked to impoundment and water management practices (community meeting, November 21, 2016). Other cultural contaminant issues related to the historic flooding of burials is also a concern for some Ktunaxa households. Uncertainty regarding methyl-mercury in the fish-bearing system, as well as related concerns, affects Ktunaxa citizens' confidence in the quality of wild food, including fish (also see C3).

C6.2 Social Sector Anticipated Project Effects

This section describes anticipated Project effects for each VC, including identification of impact pathways, characterization of anticipated Project effects, and recommended mitigations and actions.

C6.2.1 Housing, Transportation and Social Services Impacts

Key impact pathways for housing, transportation, and social services include outmigration from the Ktunaxa reserve communities and in-migration to the regional urban municipalities.

Employment-related Outmigration

The potential magnitude of adverse Project effects due to out-migration is tied to the success in gaining access for Ktunaxa workers to BC Hydro employment, which has had limited success. As mentioned earlier, if successful at increasing engagement with the Ktunaxa workforce, the Project could have positive impacts on employment security and well-being.

Concomitant adverse housing and social impacts would have to be recognized and managed. These may include:

- increased incidence of adverse wealth-related social effects, including the potential for increased economic disparity between Ktunaxa citizens and related social conflict, and increased incidence of unhealthy coping strategies (including alcohol or addictions problems) related to stress and change;
- less access to culturally appropriate services for citizens who relocate for work; and
- reduced access to social services for off-reserve citizens impacted by increased population in proximity to the project (i.e., lower vacancy rates, higher housing costs, higher demand on health care services and other social service delivery).

Most Ktunaxa who want to work at the Project will face a temporary move to a closer community, or the need to find temporary accommodation near the site during work periods and returning to their homes for rest periods. Those who relocate face potential adverse impacts, including:

- experience of racism or of being an outsider;
- isolation and loss of community connectedness, which may result in poor coping strategies (e.g., increased substance abuse);
- increased housing costs away from Ktunaxa communities;
- unequal purchasing power within their new community, and increased inequality within the Ktunaxa community; and
- reduced access to social services, such as health care centres, daycare services, and cultural opportunities available on or near reserve.

Out-migration for employment may have both positive and negative impacts on social service demands. It may reduce demand where income security is improved and poverty and unemployment reduced.

Population and Demographic Change and Housing

The earlier sections of the EA identify pressure that will be placed on housing and services in Revelstoke. Absent mitigations, Project impacts in the LSA could include:

- exacerbation of existing housing affordability and access challenges; and
- increased pressures on health care and other social services.

C6.2.2 Ecological Approach to Human Health and Confidence in Wild Foods

Social determinants of health

Resource projects can have beneficial effects on health and well-being in that they create jobs and provide other economic benefits that can raise the standard of living. Improved incomes can lead to improved diets and healthier lifestyles. However, such projects also have the capacity to cause adverse effects on health and well-being at the individual and community levels through both impact on the land and water and impacts in the community (Kwiatkowski et al. *2*009).

If meaningful employment is made available to Ktunaxa citizens as a result of the Project, it would have the potential to improve their overall health status through increased employment and income. However, given limited employment with BC Hydro for Ktunaxa citizens to date, the magnitude of positive effect is anticipated to be low. Absent mitigations, the Project is also likely to cause adverse impacts as a result of ongoing impacts to social and cultural cohesion and continuation of existing disparities in wealth between Indigenous and non-Indigenous communities in the region. Ktunaxa citizens employed at the Project are also potentially subject to additional workplace health and safety risks, including long commutes, and risk of workplace accident or injury.

Confidence in Wild Foods

As discussed further in Section C3, Ktunaxa confidence in wild foods is essential for the health and social well-being of the Ktunaxa Nation and its citizens. The access to – and strength of ties with – land and closely associated cultural practices have an important impact on health (World Health Organization 2007). According to the Health Impact Assessment guidelines from Health Canada, social and community health may be affected negatively when individuals face a loss of cultural identity and quality of life, social

disruption and violence, and a breakdown of community and family support networks as a result of a development project. Furthermore, socio-cultural well-being can be affected by increased stress, anxiety, and feelings of alienation (Kwiatkowski et al. 2009) As stated by the Ktunaxa in the KNC Social Sector Evaluation Plan (2010), “For our people, health of individuals, families and communities cannot be separated from the vitality of our culture and language.”

There are a number of pathways that can result in reduced access to or use of the traditional food economy and harvested food in diet. These include:

- reduction of access to traditional harvesting territories;
- increased scarcity or competition as a result of increased access and use by non-Ktunaxa populations;
- reduced numbers of animals or changes in wildlife migratory patterns;
- reduced time available due to employment, education or training;
- reduced access due to living off reserve;
- contamination of or perceived risk of contamination of wild foods[4]; and
- reduced of transmission of traditional harvesting knowledge from elders due to the above factors.

These factors can affect food and income security, cultural continuity, social cohesion, physical and mental health, and self-determination and self-sufficiency[5] (Power 2008; Reading and Wien 2009). Research by Chandler and Lalonde (2008) found that a lack of cultural continuity is a factor in suicide risk.

The findings of the Ktunaxa Diet Study indicate that there is already behaviour change in Ktunaxa citizen practices and diet as a result of reduced confidence in wild foods due to existing or perceived contaminant risk (Fediuk et al. 2013). Based on available information, methyl-mercury and related concerns are of particular concern to Ktunaxa citizens in the Project area. Absent substantial mitigations, highly visible industrial effects of the Project, combined with heightened awareness of cumulative effects in the region which the Project would contribute to through operations, are likely to further impair Ktunaxa confidence in wild foods. Cultural relationships and values maintained through harvesting, sharing and redistribution are discussed and assessed in Section C3.

In section B8.1.1, BC Hydro acknowledges the linkage between impoundment dams and “the generation of methyl-mercury through the methylation of inorganic mercury under anoxic conditions present in the

[4] The everyday risk judgments that people make influence their actions and behavior. It is important to assess not just the biophysical human health risk, but also what people’s perceptions are, in order to understand how they may respond to a new technology or change. (Slovic 1987, 1993; Baird 1986).

[5] Self-determination is defined in this report as the ability to participate equally in political decision-making, as well as possess control over their lands, economies, education systems, and social and health services. It is not about self-government only but a broader component of autonomy that includes the degree to which citizens believe that they are in control of their lives on a daily basis. The degree of self-determination has been connected with health status and outcomes in Indigenous communities (Reading and Wien: 2009).

substrate" and the possibility of elevated mercury concentrations in fish through bioaccumulation (SNC-Lavalin 2016:1-2).[6] However, in their assessment, BC Hydro determines methyl-mercury is not a Project-specific concern for the following reasons:

- Any methyl-mercury in the system is associated with past project effects (i.e. the original 1984 impoundment and flooding that created the Revelstoke Reservoir), and therefore not relevant to the addition of the sixth generating unit;
- Within an impounded system, studies show methyl-mercury concentrations in fish decrease over time, a trend shown in Revelstoke Reservoir rainbow and bull trout tested in 1985 and then again in 1995;
- New mercury accumulation risk associated with live storage range or reservoir elevations is not expected; and
- Mercury accumulation risks posed by the re-suspension and deposition of carbon-rich and labile sediments caused by shoreline erosion or bedload transport is unlikely since "the Revelstoke Reservoir shoreline has largely stabilized since initial impoundment and Reservoir Drawdown events are a rare occurrence" (SNC-Lavalin 2016:2).

As noted in section C2 (water), KNC review of available baseline indicates that Project related increases in erosion of vegetated areas will occur. Despite anticipation of a more than 10% increase in wetted area within the MCR under modeled and reasonably foreseeable Project conditions, erosion modelling by BC Hydro is likely not precautionary as important parameters, including freeze-thaw cycling may have been omitted . As such, and absent other convincing information, additional work to understand the effect of the Project on methyl-mercury is warranted, as is culturally appropriate communication and engagement of Ktunaxa citizens to support confidence fish and other wild foods from the Project area.

C6.3 Social Sector Mitigations

Ktunaxa-recommended measures and mitigations relevant to the valued component, including continued engagement with KNC in strategic planning for social mitigations, is detailed in section C11.

C6.3.1 Social Sector Residual Project Effects Characterization

C4 Table C6-2 provides a characterization of anticipated Project effects on Ktunaxa social sector rights, title, and interests, assuming that mitigations and actions recommended in section C10 are fully implemented and successful.

[6] A draft version of SNC-Lavalin's Human Health Assessment for the Revelstoke Unit 6 project was commissioned by BC Hydro and shared with the Ktunaxa Nation Council.

Table C6-2 Social Sector Characterization of Residual Project Effects

Valued Components	Magnitude	Direction	Geographic Extent	Duration	Frequency	Reversibility	Probability	Context
Housing, Transport and Social Services	low	positive	regional	long	high	yes	likely	Vulnerable / Medium confidence
Ecological and Human Health / Confidence in Wild Foods	low	Neutral to positive (dependant on monitoring outcome)	regional	long	high	yes	likely	Vulnerable / medium confidence

C6.3.2 Social Sector Residual Project Effects Assessment

Absent full and successful implementation of mitigations recommended in C11, effects of the Project on Ktunaxa social valued components are likely to be negative and moderate to high magnitude as the Project can be expected to continue the pattern set by previous BC Hydro projects: contributing minimal positive benefits to Ktunaxa citizens by way of employment and procurement, and maintaining or intensifying a historic legacy of social, health, and housing disparities between Ktunaxa and non-Ktunaxa in the region that excludes most Ktunaxa from positive benefit during operations.

With full and successful implementation of mitigations and measures recommended in section C11, the Project can be expected to result in a low magnitude positive effect on Ktunaxa social sector rights, title, and interests associated with housing, transportation and social services by helping address issues through improved provision of transportation for workers from Ktunaxa communities nearest the Project, and provision of support for Ktunaxa residence in Revelstoke, focused on maximizing procurement and employment benefits for Ktunaxa. When the broader economic impacts associated with those initiatives are taken into consideration, social and economic effects may be higher magnitude. With mitigation, improvements in health status associated with income and access may be accompanied by improved confidence in wild foods, depending on the outcome of monitoring and communication results, particularly for fish and aquatic resources, and result in an overall low magnitude positive effect. Overall residual project effects on Ktunaxa subsistence use are anticipated to be adverse and significant as discussed in section C2 and C3. Social impacts (positive and negative) resulting from the Project may be significant for Ktunaxa citizens employed at the project, and possibly for the Ktunaxa Nation as a whole, depending on implementation of mitigations.

C7 KTUNAXA TITLE AND RIGHTS: LANDS AND RESOURCES SECTOR

This section summarizes current understanding of Ktunaxa lands and resources title, rights and interests related to the Project and associated potential Project impacts. The assessment relies on Ktunaxa ecological knowledge (TEK) gathered through reviewing existing documents and through primary interviews and fieldwork conducted with Ktunaxa knowledge holders as described in Section C1 Background and C3 Traditional Knowledge and Language. This section also relies on information from Ktunaxa technical experts and from information in Section B of this application including:

- Section 4.1.1 Hydrology and Fluvial Geomorphology
- Section 4.1.3 Soil
- Section 4.2 Fish and Fish Habitat
- Section 4.3 Ecological Communities
- Section 4.4 Plants
- Section 4.5 Herptiles
- Section 4.6 Birds
- Section 4.7 Mammals

This section considers impacts from the proposed Project on Ktunaxa lands and resources valued components (see Table 1.8-1, Section C1, and C7.2 below), and provides a separate characterization of Project effects based on Ktunaxa perspectives and with reference to assessment endpoints based on Ktunaxa rights and interests. While the assessment presented here relies partially upon findings from Section B, this does not imply that KNC considers these findings to be complete or adequate in all cases. As described in section C2 (water), some Section B information, including anticipation of erosion related to frost and thawing cycles, was not available at the time of writing. Where section B information was lacking, precautionary assumptions have been made based on available Ktunaxa knowledge and experience.

As described in the Revelstoke 6 Environmental Assessment (Revelstoke Unit 6, Part A, Section 1.2.2.1), the Revelstoke Dam has been in operation since 1984. Designed as a six unit generating station, the dam went into service in 1984 with four units, with the addition of units 5 and 6 deferred until energy demand warranted expansion. Unit five came into service in 2010, after receiving an EA certificate through the BCEAA process in May 2007. Construction of the Revelstoke facilities, which include a large concrete gravity dam at the generating station, an adjacent earthfill embankment dam up the west side of the reservoir, a gated spillway, penstocks, powerplant, and switchgear building, began in 1977. The dam currently generates 2,480 MW, representing approximately 23% of the installed capacity of BC Hydro's Heritage resources as listed in the Clean Energy Act.

The proposed Revelstoke Unit 6 Project includes the addition and operations of related equipment at the Revelstoke Generating Station, the addition of a new capacitor station near Summerland and a proposed increase in the associated water license. Section C7 only considers impacts from proposed Project at the generation site (the proposed capacitor station is outside of Ktunaxa ʔamakʔis) and the water license (this section does not consider Project effects related to the transmission line or the capacitor).

Quality and quantity of culturally important[1] resources in the Revelstoke Reservoir (RR), Mid Columbia River (MCR) and the Upper Arrow Lake reservoir has declined since the 1930s and the associated Ktunaxa title, rights and interests have been impacted as a result (for additional information on Ktunaxa perspectives on use and cumulative effects, please see C3 and C8 respectively). Based on input from Ktunaxa knowledge holders (Field interviews, August 17, 2016) as well as published information on the impacts of the Revelstoke Dam,[2] important Ktunaxa values such as biodiversity, including riparian ecosystems, caribou, salmon, sturgeon and other fish, and archaeological sites, are already severely impacted in the Revelstoke Reservoir and the broader upper Columbia watershed. Any further adverse incremental impacts to Ktunaxa values related to the Lands and Resources Sector from the Project will occur within the context of substantial pre-existing impacts to Ktunaxa title, rights and interests. From a Ktunaxa perspective these pre-existing impacts already exceed acceptable levels.

C7.1 Overview

As noted in the introduction to Section C1, ʔaknumuɬtitit (Ktunaxa law) and ʔaqaɬqʼanuxwatiɬ (oral history) are both sacred and legal in nature. According to a knowledge holder,

> *Ktunaxa are also good conservation people… we are conservation officers – officers, or just conservation-conscious. But yet, we don't get credit for it because we know it's – if you see a herd of elk and you take one or two, go find another herd and take one or two out of that herd. You know, it's all about – so it's just like when we used to go get duck eggs. If you see a nest of six, you only pick three, you know. So we're all conservationists. (Y05, April 16, 2016)*

Ktunaxa land and resources rights are based on a sacred covenant with the Creator, whereby, in exchange for the land providing the Ktunaxa with the necessities of life, the Ktunaxa are responsible as stewards of the lands and resources in Ktunaxa ʔamakʔis.

> *For thousands of years the Ktunaxa have honored a covenant with the Creator to protect their extensive homelands by serving as the true guardians of the region. In exchange for this service the Ktunaxa were granted sustenance through the use of the abundant resources in the area.*
>
> *Since time immemorial, the Ktunaxa people have coexisted with Mother Earth's creations in their natural habitat. Even today, Ktunaxa stewardship requires the utmost respect and protection for all elements of the natural world. As guardians, Ktunaxa people believe that life has little value without a true appreciation of the integrity of the environment and a genuine regard for all that is sacred. (Kootanai Cultural Committee in Montana 1997: p. xii)*

[1] Culturally important refers to more than simple subsistence use values. From the perspective of Ktunaxa stewardship, rare, endangered or hard to find species are culturally important, as are more common resources or animals that may be harvested, or may be important for other reasons.

[2] See published reports available through BC Hydro: https://www.bchydro.com/about/sustainability/conservation/water_use_planning/southern_interior/columbia_river.html, accessed 18 December 2016.

As noted in Section C1, the Ktunaxa Lands and Resources Council (KLRC) manages the Lands and Resources Sector of the KNC on behalf of the Ktunaxa Nation. Their philosophical approach to lands and resources stewardship is based on the Ktunaxa recognition that they are stewards of the land. The Ktunaxa have terms that address the natural world and how people are a part of it. ʔakuk'pukam speaks to anything that gets life from the earth through roots. ʔakuk'pukamnam adds the human dimension, whereby the earth's life is translated into human life. That is, the Ktunaxa have roots that tie them to the land, and they are of the earth. In other words, they believe that what we do to the earth, we do to ourselves and to future generations.

The Ktunaxa phrase that captures interconnectedness and the stewardship concepts applicable to land management is YaqaɬHankatitiɬkinaʔamak. This phrase translates to "our people care for the land, the land cares for our people." It is about the Ktunaxa's relationship with the land. Caring for the land also includes both local and more global perspectives. Ktunaxa recognize the global impacts of their stewardship, and of hydro-electric operations, including related energy and climate change issues.

Ktunaxa laws also include the concept of 'only taking what you need.' Within the Ktunaxa vision, this concept, as well as other components of Ktunaxa law, are applicable to everyone who seeks to live on this land. Some steps towards reconciling this concept with the current scale of hydro-electric activity can be achieved through the concept of 'giving back to the land.' In the context of the Columbia River hydro-electric operations, 'giving back' requires prioritizing restoration of ecology, salmon, cultural relationships, and rigorous stewardship. It also suggests that hydro-electric generation and dam operations should be adjusted in consideration of ecological and cultural sustainability and integrity.

Flowing from this philosophy of interconnectedness, the KLR maintains the following stewardship objectives:

1. Fulfilling the Ktunaxa Nation's stewardship responsibility to ʔa'kxaṁis ḳapi qapsin (All Living Things) and exercising the Ktunaxa Nation's inherent right to make decisions regarding lands and resources within Ktunaxa ʔamakʔis;
2. Restoring and conserving ecosystems, biodiversity, species at risk (SAR), fish and wildlife populations and plant communities;
3. Maintaining, protecting and enhancing Ktunaxa aboriginal rights, including aboriginal title, as a whole;
4. Identifying, protecting, and managing cultural heritage resources (inclusive of archaeological sites, traditional use sites, oral history, artifacts, landforms, and archival resources);
5. Reducing the carbon emission and climate change impacts of energy project development and and use;
6. Developing Ktunaxa stewardship knowledge and capacity;
7. Managing social impacts associated with development of lands and resources;
8. Benefiting from economic opportunities;
9. The general health of the environment; and,

10. Restoring lands and ecosystems that have been damaged through lack of adherence to ʔaknumuɬtitit. (KLRA Policy Framework; 2011 *currently under revision*).

C7.2 Ktunaxa Lands and Resources Valued Components

The following VCs are used to assess Revelstoke 6 project-specific impacts to Ktunaxa lands and resources[3]:

- **Biodiversity** which is a holistic valued component that includes the following indicators:
  - Culturally important ecosystems and plant populations, including abundance and condition of rare ecosystems, aquatic ecosystems, and wetland, riparian, upland ecosystems and habitats, cottonwood forests and old forests;
  - Sustainable and healthy populations of wildlife[4], rare species and species of cultural importance, including quantity and quality of habitat, connectivity within and between habitats, and quality of sensory conditions (integrating influences of air, water, and acoustic quality on wildlife mortality risks);
  - Sustainable and healthy populations of fish, including quality and quantity of habitat for rare and culturally important fish species;
  - Aquatic productivity including the quality, quantity and timing of nutrients available in the ecosystem and primary (algae) and secondary producers (invertebrates).
- **Shoreline erosion and Sedimentation**
  - Soil and sediment availability and loss due to erosion within affected ecosystems;
- **Archaeology**
  - Ktunaxa knowledge holders identify a strong cultural and spiritual importance of archaeological sites as well as the scientific and technical values assessed in Section B of the application.

C7.2.1 Assessment Boundaries

C7.2.1.1 Spatial

Table 7.1 lists each of the VCs and indicators under the Lands and Resources VC, and describes the spatial scale at which they are assessed, making reference to the Ktunaxa LSA and RSA defined in

[3] Please see section C1 Background for an explanation of how the Valued Components were identified and defined.

[4] In this context sustainable refers to the ability of a population to sustain rights-based harvesting (adequate numbers of individuals in accessible areas for the practice of Ktunaxa rights.

Section C1, and where relevant to spatial scales defined in Section B of this report (Universities Consortium on Columbia River Governance, 2015).

C7.2.1.2 Temporal

The assessment looks at temporal changes from a pre-dam baseline, to current baseline conditions, through to an assessment of how current conditions will change as a result of the Project. As is described in subsection C2 Water, the current baseline conditions are already impaired as a result of legacy effects and impacts exceed the acceptable level of change in ʔa'kxaṁis ḳapi qapsin from the perspective of Ktunaxa knowledge holders (KNC meeting, November 21, 2016). Any additional incremental adverse effect attributable to the Project occurs within the context of this existing historical impact. Numerous previous studies, including Utzig and Schmidt (2011) and a 2015 report on governing the use of water and related resources in the International Columbia Basin have documented the extent of cascading impacts from changes in water flow throughout the Columbia Basin, including within the Arrow and Revelstoke reservoirs. According to the 2015 report, over 230 man-made dams in the Columbia basin hold back waters for irrigation, transportation, hydroelectricity, flood risk management, recreation, and other uses (Universities Consortium on Columbia River Governance, 2015). The resulting changes in the hydrology of the system have dramatically affected access and available resources for Tribes and Indigenous Peoples living along Columbia Basin waterways.

The absence of salmon in the system is one indicator of this legacy of impact. The importance of salmon to tribes and Indigenous peoples in the Pacific Northwest is highlighted on p. 19 of the Universities Consortium Report. As this report explains, before the completion of the Grand Coulee dam in the US in 1939, over a quarter of all Chinook, sockeye, and steelhead migrated into the upper Columbia River in the US and into Canada. These runs, associated tribal and Indigenous people's harvest, and fishery related economies above Grand Coulee were completely lost as a result of dam construction. As the report states on p. 30:

> *The flooding of various landscapes and the decimation of salmon in the upper Columbia basin and depletion through the lower Columbia basin caused irreparable and continuing harm to the Columbia Basin First Nations and tribes. With the loss of salmon, First Nations and tribal members lost their fishing related economy, social exchanges and sense of community, and, over generations, the loss of traditional knowledge related to the harvest, preparation, and use of salmon. Additionally, the decline of salmon removed a key species from both the aquatic and terrestrial ecosystems, the complete ramifications of which are still not yet known with certainty.* (Universities Consortium on Columbia River Governance, 2015).

Ktuanxa citizens understand that they are the only indigenous peoples in the Province of BC that have no access to anadromous salmon within their homelands (where they historically relied heavily on these species). In addition to the loss of salmon, Ktunaxa knowledge holders have identified numerous other species including white sturgeon that were once abundant and culturally essential but are no longer available for harvest in the Columbia watershed (see section C3 TKL). An accounting for Project effects within must reference the original state of the ecosystem before the dam itself was constructed and including a pre-development baseline where Ktunaxa title and rights were practiced without infringement.

Table C7-1 Indicators and Data Sources in Lands and Resources VC with Spatial Scale of Assessment Noted

VC	Indicator(s)	LSA	RSA
Biodiversity	**Culturally Important Ecosystems, Habitats and Plants** • Abundance and condition of rare ecosystems; wetland, riparian, forest and grassland ecosystems and habitats; cottonwood forests, old forests • Abundance and condition of culturally important ecosystems • Abundance and condition of culturally important plants	Qualitative discussion focused on Ktunaxa LSA (Section C1), which includes downstream areas within 5km of the Mid Columbia Reach (MCR). Draws on quantitative analysis in Section 4.3, based on Generation LSA defined in Table 4.3-3: 14,702 ha in total, consisting of: - 500 m buffer in all directions from the proposed construction footprint required for the addition of a 6th generating unit at the Generating Station; and - the MCR and operational high water limit of the Arrow Reservoir downstream to approximately Shelter Bay, buffered by 500 m (to address potential microclimatic and biotic edge effects adjacent to the drawdown zone).	Qualitative discussion focused on Ktunaxa RSA (Section C1). Draws on quantitative analysis in Section 4.3, based on Generation RSA defined as: 368,366 ha in total, consisting of: - Kinbasket Reservoir downstream to Hugh Keenleyside Dam (including Revelstoke and Arrow Reservoirs), and the Illecillewaet, Jordan, Akolkolex, Mulvehill and Cranberry Landscape Units.
	Culturally Important Wildlife and Habitat • Sustainable populations of culturally important wildlife and rare species • Quantity and quality of habitat for culturally important wildlife and rare species • Connectivity within and between habitats of culturally important wildlife and rare species • Mortality risks to culturally important wildlife and rare species • Quality of sensory conditions (noise, water and air quality) for culturally important wildlife and rare species	Qualitative discussion focused on Ktunaxa LSA (Section C1), which includes the Mid Columbia Reach (MCR). Draws on quantitative analyses in Sections 4.6 and 4.7 based on the Generation LSA, defined as: 14,702 ha in total, consisting of: - 500 m in all directions from the proposed construction footprints required for the addition of a 6th generating unit at the Generating Station; and - the MCR and operational high water limit of the Arrow Reservoir downstream to approximately Shelter Bay, buffered by 500 m (to address potential microclimatic and biotic edge effects adjacent to the drawdown zone)	Qualitative discussion focused on Ktunaxa RSA (Section C1). Draws on quantitative analysis in Section 4.3, based on Generation RSA defined as: 368,366 ha in total, consisting of: - Kinbasket Reservoir downstream to Hugh Keenleyside Dam (including Revelstoke and Arrow Reservoirs), and the Illecillewaet, Jordan, Akolkolex, Mulvehill and Cranberry Landscape Units.
	Culturally Important Fish and Fish Habitat Fish (Salmon, sturgeon and other fish) • Sustainable populations of fish (salmon, sturgeon and other fish species) • Quality and quantity of habitat for fish species (salmon, sturgeon and other fish species) • Fish mortality risks	Qualitative discussion focused on Ktunaxa LSA (Section C1), which includes the Mid Columbia Reach (MCR). Draws on quantitative analyses in Sections in Section B 4.2 Fish and Fish Habitat. - RR - Revelstoke Reservoir from the base of Mica Generating Station to Revelstoke Generating Station - MCR – Columbia River downstream of Revelstoke Generating Station to approximately Arrowhead (at the head of the Upper Arrow Lake)	Qualitative discussion focused on Ktunaxa RSA (Section C1). Draws on quantitative analysis in Section B 4.2 Fish and Fish Habitat. - MCR/RR - Kinbasket Reservoir downstream to Hugh Keenleyside Dam (including Kinbasket, Revelstoke, and Arrow Reservoirs)

	Aquatic Productivity • Quantity, quality of nutrients (food resources for fish) and timing of nutrient delivery	Qualitative discussion focused on Ktunaxa LSA (Section C1), which includes the Revelstoke Reach (RR) as well as the Mid Columbia Reach (MCR). Draws on quantitative analyses in Sections in Section B 4.2 Fish and Fish Habitat. - RR - Revelstoke Reservoir from the base of Mica Generating Station to Revelstoke Generating Station - MCR – Columbia River downstream of Revelstoke Generating Station to approximately Arrowhead (at the head of the Upper Arrow Lake)	Qualitative discussion focused on Ktunaxa RSA (Section C1). Draws on quantitative analysis in Section B 4.2 Fish and Fish Habitat. MCR/RR - Kinbasket Reservoir downstream to Hugh Keenleyside Dam (including Kinbasket, Revelstoke, and Arrow Reservoirs)
Shoreline Erosion and Sedimentation	• Soil and sediment availability and loss	Qualitative discussion focused on Ktunaxa LSA (Section C1), which includes the Revelstoke Reach (RR) as well as the Mid Columbia Reach (MCR). Draws on quantitative analyses in Sections 4.6 and 4.7 based on the Generation LSA, defined as: 14,702 ha in total, consisting of: - 500 m in all directions from the Proposed construction footprints required for the addition of a 6th generating unit at the Generating Station; and - the MCR and operational high water limit of the Arrow Reservoir downstream to approximately Shelter Bay, buffered by 500 m (to address potential edge effects adjacent to the drawdown zone).	Qualitative discussion focused on Ktunaxa RSA (Section C1). Draws on quantitative analysis in Section 4.3, based on Generation RSA defined as: 368,366 ha in total, consisting of: - Kinbasket Reservoir downstream to Hugh Keenleyside Dam (including Revelstoke and Arrow Reservoirs), and the Illecillewaet, Jordan, Akolkolex, Mulvehill and Cranberry Landscape Units.
Archaeology	• Project effects on archaeological sites	Qualitative discussion focused on Ktunaxa LSA (Section C1), which includes the Revelstoke Reach (RR) as well as the Mid Columbia Reach (MCR). Draws on quantitative analyses in Sections B 7 and includes: - Revelstoke Reservoir and Generating Station which includes the active and potential erosion zone (i.e., drawdown zone and lands above the drawdown zone between Revelstoke and Mica Generating Stations, as well as the Revelstoke Generating Station area itself). - MCR which incorporates the active and potential erosion zone (i.e., drawdown zone and lands above the drawdown zone that are determined by the Project hydrology and erosion modelling/studies to be susceptible to erosion within/between the dam and Shelter Bay).	Qualitative discussion focused on Ktunaxa RSA (Section C1). Draws on quantitative analysis in Section B7 and is the same as the LSA.: - Revelstoke Reservoir and Generating Station which includes the active and potential erosion zone i.e., drawdown zone and lands above the drawdown zone between Revelstoke and Mica Generating Stations, as well as the Revelstoke Generating Station area itself). - MCR which incorporates the active and potential erosion zone (i.e., drawdown zone and lands above the drawdown zone that are determined by the Project hydrology and erosion modelling/studies to be potentially susceptible to erosion within/between the dam and Shelter Bay.

C7.3 Ktunaxa Lands and Resources Baseline Conditions

C7.3.1 Biodiversity

For this assessment, the Ktunaxa Nation understands the maintenance of biodiversity to mean:

> maintaining the health, quantity, and variability of all living things within Ktunaxa lands at levels equivalent to pre-1900 conditions. Maintaining biodiversity requires the protection of individuals, populations, species, communities and habitats, including ecosystem structure, function and processes. While the Ktunaxa recognize that their lands and waters are alive, and therefore evolving, they believe that no human actions should change the abundance, range, or distribution of plants or animals in ways that threaten the future practice of Ktunaxa culture and way of life[5].

As a holistic concept, biodiversity is complex and difficult to measure. The assessment below uses measures specific to cultural importance, ecosystems, habitat, plants, wildlife, and fish to assess potential or perceived Project effects on biodiversity. Maintaining biodiversity requires analyses using multiple filters. The coarse filter (ecosystem) level seeks to maintain self-sustaining and culturally effective ecosystems at or near the historic (pre-industrial) natural range of variability (including intact and connected habitats for wildlife and culturally important plants (CIPs)). The fine filter (species-specific) level focuses on maintaining habitat for species that are ecologically rare (species at risk) and/or culturally important.

C7.3.1.1 Ktunaxa Thresholds of Acceptable Change for Biodiversity

In addition to the Ktunaxa definition of biodiversity above, Ktunaxa knowledge holders have identified that biodiversity should include representation of ecosystems, habitats, wildlife, fish, and culturally important plants, all of which are within their natural range of variability[6] and sufficient in both *quantity* and *quality* to allow for the practice of Ktunaxa rights and interests (related to each identified component and ʔa’kxaṁʔis q̓api qapsin).

Based on the Ktunaxa definition, biodiversity within the Generation Project footprint and Ktunaxa LSA is already severely impaired and exceeds both cultural and ecological thresholds of acceptable change for

[5] Within the Ktunaxa concept of ‘all living things’, unique landforms, habitats and ecosystem components, such as rivers, lakes or ‘water’, as well as spiritual, ecological or sensory qualities and conditions, may also be considered to be ‘alive’ for the purposes of ‘biodiversity’ and supporting the ongoing practice of Ktunaxa title and rights. For the purpose of this assessment, impacts on water are highlighted and addressed separately in section C2.

[6] From: http://www.env.gov.bc.ca/fia/documents/TERP_eco_rest_guidelines/defgoals/rangeofvar.htm: The *natural range of variability* refers to the spectrum of ecosystem states and processes encountered over a long time period (Gayton 2001). Because so many ecosystems have been altered by European settlement, the "natural" range of variability usually refers to the full range of ecosystem structures and processes encountered before major changes brought by non-aboriginal humans. The natural range of variability is typically defined by the period 100-200 years before European settlement, and is also surmised from knowledge of natural disturbance regimes. Natural range of variability is often used to describe disturbance processes, and the ecosystem variability that these disturbances create. Ecosystems are thought to be more sustainable if we manage them so that their current disturbance regime falls within the natural range of variability (Gayton 2001).

the Ktunaxa (KNC meeting, November 22, 2016; field interviews, August 2016). In the context of this severely altered and impaired baseline, any further incremental Project effects will be considered a significant impact to the biodiversity VC. It is further important to note, from the Ktunaxa perspective, that even very local changes in the condition or availability of ecosystems and habitats within the DDZ represent a significant effect from the perspective of biodiversity loss, given the magnitude of losses and degradation that have already occurred compared to the pre-dam baseline.

C7.3.1.2 Culturally Important Ecosystems, Habitats and Plants

As identified in the Revelstoke Unit 6 EA, ecological communities within the Generation LSA range from sedges and grasses, riparian shrubs, and forests (Revelstoke Unit 6 EA, Section 4.3.2.2, p. 21). The Generation Project areas, including the Revelstoke Reach (RR) and the mid-channel reach, are located within the Revelstoke Higher Level Planning Area. The RR Project area overlaps within the Frisby Reach and LaForme Landscape Units, while the mid-channel reach overlaps with portions of the LaForme, Illecillewaet, Akolkolex, Mulvehill, Jordan, Cranberry, and Lake Landscape Units. Portions of old growth management areas (non-legal OGMAs)[7] are found within these landscape units, as is most of the Blanket Creek Provincial Park and a small portion of Mount Revelstoke National Park.

As described in Section 4.3.2.2.1 of the Revelstoke EA, the Generation LSA falls within the Interior Cedar Hemlock (ICH) biogeoclimatic zone (Demarchi 2011; DataBC 2015), with three subzone variants present in the LSA: the area between Revelstoke Dam and Shelter Bay falls within the ICH moist warm Thompson subzone variant (ICHmw3), except for the section between the Akolkolex River and Beaton Arm, in the east side of the Mid Columbia reach (MCR), which is the ICH moist warm Columbia-Shuswap subzone variant (ICHmw2). The Wells Gray wet, cool variant (ICHwk1) is present in the northern end of the LSA around the Revelstoke Dam (Figure 4.3-6 in Revelstoke Unit 6 EA, Section 4.3).

C7.3.1.2.1 Pre-Revelstoke Dam Culturally Important Ecosystems and Plants Baseline

As noted in Table C7.1, the Ktunaxa LSA for culturally important ecosystems and plants includes both the Revelstoke reservoir and the Arrow reservoir, while the Generation LSA defined in Sections 4.3 and 4.4 only includes the Arrow reservoir. Current baseline conditions and impacts within the Revelstoke reservoir are discussed below, but only in general terms due to a lack of information about the baseline and potential risks to ecosystems, habitats and plants in this area.

Section 4.3 of the Revelstoke Unit 6 EA focuses on existing conditions with respect to ecosystems. Ktunaxa knowledge holders emphasize that, before the Revelstoke dam was built, ecosystems present along what is now the Revelstoke reservoir and Arrow reservoir were very different.

> *Interviewer: What do you think would be the ideal to bring this back for Ktunaxa?*

[7] Non-legal OGMAs are those that have not been declared in a provincial old growth order.

> *Y01: Well for one thing, the dams, they really decimated, wrecked a lot of habitat. A hundred years ago when all this happened, the turn of the century. It might not ever come back. We can try, but I might not be around long enough to see it. (Y01, August 19, 2016)*

Ecosystems present in the Columbia Basin prior to dam construction (pre 1922) and changes to those ecosystems as a result of dam construction and operation are described in MacKillop et al. (2008) and Utzig and Schmidt (2011)[8]. As documented in these reports, pre-dam, the Arrow reservoir was a lake surrounded by wetlands, while the Revelstoke reservoir was a large river system dominated by forested ecosystems. Flooding of the Revelstoke reservoir area resulted in the loss of lotic (riverine) habitats, while lentic (lake/reservoir area) increased. Changes in littoral habitat (i.e., the nearshore area where sunlight penetrates all the way to the sediment and allows aquatic plants to grow) vary considerably because of reservoir management regimes, with storage reservoirs like Revelstoke and Arrow showing much higher water level fluctuations compared to natural lakes.

Pre-dam, the Revelstoke reservoir area was dominated by upland forests and floodplains, with a small portion of wetlands, gravel bars, and the river system (Figure 3 in Utzig & Schmidt, 2011). Based on the analysis presented in Table 6, flooding of the Revelstoke reservoir resulted in the loss of 8,882 ha of terrestrial ecosystems, notably intermediate, wet, and very wet forests, and wetlands. In Arrow, the pre-dam ecosystems were similarly represented by upland ecosystems and floodplains, with wetlands, gravel bars, river systems, and a dominant lake system. Flooding of the Arrow Lakes area resulted in the loss of 14,258 ha of terrestrial ecosystems, notably wet forests, gravel bars, cottonwood forests, and wetlands (Table 6 in Utzig & Schmidt, 2011).

Loss of these ecosystems has had a profound impact on Ktunaxa use of these areas, and represents an important and measureable impact on the ability of Ktunaxa citizens to practice title and rights in these areas.

> *And it's sad because when it affects the fish, what eats the fish? It's not just humans that eat fish, it's not just, where's the bears? And somebody was talking about the impacts? We were just up there and it's August and the eagles are coming. The eagles, what's gonna happen if we do put in more, put more in, it's going to affect our fish and our birds, the wildlife, and the plants. And nobody's even fixing it, they're just ruining it and we've always been told not to ruin anything, and. I try to keep an open mind. If you're going to do something, do what you gotta do, but make sure you fix it, make sure it's always comes back better than the way you left it. That's what we were taught in school. So what makes it okay to do this to our land? (A04, August 18, 2016)*

Impacts from the loss of culturally important places, resources and ecosystems on the MCR and elsewhere were compounded by colonial policies restricting Ktunaxa practice of rights, requiring Ktunaxa

[8] This reference looks at ecosystems before any BC Hydro dams were built in the Canadian portion of the Columbia River Basin and thus discussed discusses cumulative effects from impacts of dams, rather than just the effect of the Revelstoke dam. However, it is reasonable to assume that a portion of the impacts within the Revelstoke reservoir (specifically, water fluctuations and entrainment or loss of fish from the Revelstoke reservoir) and a portion of the impacts within the Arrow Lakes reservoir (specifically, water velocity, erosion risk, and a portion of the water fluctuations) are a direct result of operating practices associated with the Revelstoke dam.

families to relocate away from the MCR in order to live on reserve and send children to federally administered schools.

C7.3.1.2.2 Current Culturally Important Ecosystems and Plants Baseline

Revelstoke reservoir Drawdown Zone (DDZ): Previous survey work reported that the Revelstoke reservoir area was highly disturbed during previous dam construction. It consists of extension areas of early seral vegetation, sparsely vegetated areas, and scattered patches of young trees. The highly modified vegetation in the Revelstoke reservoir area bears little resemblance to the forested site series defined for the ICHwk1 (Braumandl and Curran 1992).

From the Ktunaxa perspective, there is very little in the way of culturally valuable plants or ecosystems currently remaining immediately adjacent to the Revelstoke reservoir, within the DDZ (Field interview, Aug 17, 2016). The hydro-electric infrastructure interacts with the uptake of private land, agriculture and other impacts to ecosystems. This is a result of significant adverse impacts of historical hydro-electric projects affecting ecosystems conditions in the Columbia River valley. Before the development of the dams, the wetlands, wet forests and cottonwood forests adjacent to the pre-existing riverine system were regularly used for gathering culturally important plants and hunting/trapping animals for subsistence and ceremonial use (see subsection C3 TKL).

Arrow Reservoir (Mid Columbia River/Reach or MCR): As described in other documents, water levels within the Arrow drawdown zone may vary between 12.2 –15.2 m (40-50 feet) annually, though the variation can be as high as 20 m (66 feet) if required (Thomson 2013). The result is the almost complete lack of a biologically productive littoral zone, and ongoing shoreline erosion (Thomson 2013). As described in the Revelstoke Unit 6 EA, the operation of the Arrow Lakes reservoir has resulted in the establishment of “generalized vegetation communities” (that bear little resemblance to pre-dam vegetation communities) located within certain elevation bands:

- 434 m to 436 m – vegetation has low diversity and biomass and is dominated by sedge and grass, primarily due to reseeding programs.
- 436 m to 438 m – vegetation has high biomass and is dominated by sedge and grass, but also has other species occurring (moderate diversity); and
- 438 m to 440 m – vegetation is more terrestrial in nature and high diversity with more shrubs and fewer herbaceous plants (Moody 2005, cited in Gibeau and Enns 2008).

The vegetation communities that exist in the DDZ of the MCR are listed in Table 4.3-4 of the Revelstoke Unit 6 EA. Growth performance of vegetation in the DDZ (in terms of species distributions, biomass, height, total cover, and nutrient status) is related to extent and duration of inundation as well as the distribution of soil types, exposure to wave action and scouring, daily temperature, and precipitation (CARR Environmental Consultants and AIM Ecological Consultants Ltd. 2002; Cooper Beauchesne and Associates Ltd (CBA) 2015; Enns and Overholt 2012).

In addition to reviewing impacts to rare ecosystems, the Revelstoke Unit 6 EA identifies three types of sensitive ecosystems for the assessment (p. 27); these are wetlands, old-growth forests, and riparian areas. Ktunaxa technical advisors identified additional culturally important and sensitive ecosystems for focus studies and assessment including cottonwood forests (as a specific riparian forest type), and mature conifer forests (>100 years old), particularly white pine.

Existing wetland communities within the DDZ include habitats classified as bulrush, cattail, floating bog, shrub wetland complex, submerged buoyant bog, swamp, and water sedge. These make up larger complexes referred to as Airport Marsh, Lower Airport Marsh (and Locks Creek), Montana Slough, Cartier Bay, and Downie Marsh (Figure 4.3-9 in Revelstoke Unit 6 EA Section 4.3). The larger wetland complexes also include open sedge/grass habitats and willow/shrub complexes and are situated mostly at elevations between 433 and 438 MASL. A brief description of each of these areas is provided in Section 4.3, p. 27 of the Revelstoke Unit 6 EA.

As described on p. 28 of the Revelstoke Unit 6 EA Section 4.3, the entire DDZ is classified as riparian habitat. The area is divided into three bands by elevation, as described above. Ecosystem types by elevation are presented in Table 4.3-6 and Figure 4.3-8. No old forest (>250 years old) exists within the DDZ, although 133 ha of the LSA is classified as old forest (p. 30 of the Revelstoke Unit 6 EA Section 4.3)[9]. It is not known how much mature conifer forest (>100 years old) exists within the DDZ or immediately adjacent to it. In terms of invasive plants, Eurasian water-milfoil is the dominant invasive plant of aquatic habitats within the drawdown zone (Miller and Hawkes, 2014); it has been confirmed at Cartier Bay, Montana Slough, and Airport Marsh. Other invasive plants found within the MCR are listed in Table 4.3-7. Wildlife values within the Revelstoke Reach DDZ are described in Table 4.3-6.

Fieldwork conducted with Ktunaxa knowledge holders in August 2016 included visits to key wetlands along the Arrow Lakes reservoir to identify culturally important values in these areas. As above with the DDZ in the Revelstoke reservoir, despite the wetlands that exist within the MCR DDZ, and the wildlife values identified in the Revelstoke Unit 6 EA, from a Ktunaxa culture and use perspective, the ecosystems found within the MCR DDZ were heavily impacted and dominated by reed canary grass with little evidence of the type of plant or animal diversity anticipated in a wetland of this type:

> *It's not a wetland at all…Wetlands? It's not even swampy, there's no water under my feet, I'm not sinking. Nothing for anything to survive out here. Soils, the ground is hard. What I really want to see is cattails. Cattails we use, we eat the root, it's cucumber. The shoot, we use it to make our mats. We also use it to make flour. And the birds use it for their homes. It was always an indicator that if you saw a cattail, there was, there's drinking water nearby, is what I was always told. (A04, August 19, 2016)*

Table 4.3-4 notes 108.3 ha of riparian forests, consisting of cottonwoods and shrubs, with a variable conifer component, within the DDZ, as well as small amounts of upland conifer and upland mixed forest within the DDZ. The age of these areas is not provided in Section 4.3. Based on input from Ktunaxa citizens, these are remnant ecosystems that were formerly much more widespread within the area referred to as the DDZ, and may continue to perform some important cultural functions within this highly impacted ecosystem (S10, field interview, August 19, 2016).

[9] It is understood that the Predictive Ecosystem Mapping classification excludes 637 ha in the LSA and that this area is not considered in the assessment; some of this area is OGMAs and old forest,

In terms of specific plants of cultural importance, Ktunaxa citizens emphasize that all plants that occur or used to occur within the Ktunaxa LSA are considered important and contribute to biodiversity within these areas. Previous work with Ktunaxa knowledge holders has identified a series of high importance plants for Ktunaxa cultural use, focused on plants that are gathered for subsistence and cultural purposes. Specific to the ecosystems present within the Ktunaxa LSA, this includes the following plants: water parsnip (*Sium suavel*), cow parsnip (*heracleum lanatum*), black cottonwood (*Populus balsamifera ssp*. *trichocarpa*), Pacific yew (*Taxus brevifolia*), beaked hazelnut (*Corylus cornuta*), highbush cranberry (*Viburmum edule*), bush cranberry (*V. opulus*), black twinberry (*Lonicera involucrata*), red osier dogwood (Cornus stolonifera), western redcedar (Thuja plicata), water sedge (Carex aquatillis). wolf willow (*Elaeagnus commutata*), common horsetail (*Equisetum arvense*), Oregon-grape (*Mahonia aquifolium*), dwarf blueberry (*Vaccinium caespitosum*), black huckleberry (*V. membranaceum*), bog cranberry (*V. oxycoccus*), northern gooseberry (*Ribes oxyacanthoides*), northern bugleweed (*Lycopus uniflorus*), field mint (*Mentha arvensis*), yellow glacier lily (*Erythronium grandiflorum*), camas (*Camassia quamash*), yellow waterlily (*Nuphar polysepalum*), globeflower (*Trollius laxus*), trembling aspen (*Populus tremuloides)*, white pine (*Pinus monticola*) cattail root (*Typha latifolia*), and conifer saplings among others. Many other species of culturally important plants also occur within the ecosystems present in the Ktunaxa LSA and the ecosystems that would historically have been present within the DDZ in both the RR and the MCR.

> *[On harvesting plants above Mica] We worked above where the Mica Creek dam is now, eh? That's before the dam built… And there was all kinds of things [plants] that we picked but we couldn't do nothing because we were working. And we wanted to go back up when the dam was built, so you know, everything was under water...[Interviewer: so if I'm understanding correctly there was a lot of plants that would grow in the wet areas that were flooded?] Yeah. (Y08, April 20, 2016)*

As identified above, water flow regimes associated with maintaining desired energy production at the dams present along the Columbia River, including the Revelstoke Dam, have greatly simplified the plant communities present within the Ktunaxa LSA. Ktunaxa knowledge holders have identified the lack of diversity as an important barrier to continued cultural use of these areas.

> *Interviewer: Is this the way a wetland should look?*
>
> *Y01: Tell them [BC Hydro} we want fifty thousand willow saplings here, for starters (laughs).*
>
> *A04: And where's the birds?*
>
> *S10: There's no diversity.*
>
> *Y01: Where's the mice?*
>
> *A04: Yeah I don't see no mice trails.*
>
> *Y01: They're all choked out." (Y01, A04, S10, August 19, 2016)*

Efforts to re-establish culturally important plants (e.g., cottonwood and dogwood) within the Arrow reservoir have been only minimally successful (Enns and Overholt 2014; Revelstoke Unit 6, Section 4.4). These efforts have focused on individual plants rather than ecosystem restoration (BC Hydro 2013). Further efforts in the form of altering dam flow regimes are likely required to re-establish plants and ecosystems that are more consistent with what would have been found in the DDZ prior to the Revelstoke dam being built.

During fieldwork conducted with Ktunaxa knowledge holders specifically aimed at impacts to wetlands within the MCR, the absence of willow in wetlands within the DDZ was also noted as important by Ktunaxa knowledge holders, who described the importance of willows both for cultural use and for habitat.

> *S10: Yeah, they're a good tea, they're a—*
>
> *A04: Making sweat lodges.*
>
> *Y01: They're good for bird habitat too, the willow.*
>
> *S10: And if you boil, boil the bark and make a tea, it's good for cramps, it's good for headaches, high blood pressure." (S10, A04, Y01, August 19, 2016)*

C7.3.1.3 Culturally Important Wildlife and Habitat

Ktunaxa citizens identify all wildlife as important due to their contribution to biodiversity. This assessment focuses on impacts to ungulates, carnivores, furbearers, and migratory birds within the Ktunaxa LSA and RSA for this Project, while also acknowledging important impacts to other wildlife species, particularly small mammals and herptiles. Information about ungulates, carnivores and furbearers within the Generation LSA can be found in Section B 4.7 of the Revelstoke Unit 6 EA, while information about birds within the Generation LSA can be found in Section B 4.6 of the Revelstoke Unit 6 EA. Note that the Generation LSA does not include the Revelstoke reservoir, while the Ktunaxa LSA does.

During the construction phase, the proposed Project has the potential to disturb, displace and kill wildlife directly (via increased traffic and roadkill mortality), and to impact habitat for these species during land clearing/modification required to install the 6th generating unit. During the operations phase, direct impacts to habitat will occur as a result of incremental increases in peak flow levels, changes in water levels and ice formation (within both the Revelstoke reservoir and the MCR), and increased shoreline erosion and sedimentation due to higher water velocities in the MCR.

C7.3.1.3.1 Pre-Revelstoke Dam Wildlife Baseline

Previous studies have reviewed terrestrial and wetland habitat impacts from hydroelectric development in the Columbia Basin (reviews in MacKillop et al. 2008; Utzig & Schmidt, 2011). Both studies reveal that flooding of the Arrow and Revelstoke reservoirs accounted for approximately 14,000 ha and 9,000 ha of terrestrial ecosystem lost, respectively. Losses were particularly high for very wet, wet, and cottonwood forests, as well as wetlands and gravel bars. Much of the area lost across the region as a whole was classified as late seral wet forests (structural stages 6 and 7).

Utzig and Schmidt note that, within the DDZ of some reservoirs, new ecosystems have established, particularly within the Revelstoke Reach of the Arrow Reservoir. In their words:

> *These are generally simplified ecosystems, sometimes dominated by planted exotic species. Even though some of these communities produce large quantities of vegetation, their value for higher trophic levels is limited, because of the operational effects of the reservoir (e.g., flooding of waterfowl nests prior to fledging, benthic invertebrate production limited by timing and duration of inundation). (p. 21, Utzig & Schmidt, 2011)*

Based on habitat loss data and species-habitat associations, Utzig and Schmidt evaluated dam impacts on 289 vertebrate wildlife species. The loss of floodplains, forests, wetlands, shallow water, ponds and shorelines resulted in very high to high impacts to 3 amphibian, 1 reptile, 83 bird and 22 mammal species,

with wetland and riparian specialists (such as amphibians, waterbirds, waders, songbirds, bats and aerial insectivores) most impacted. Historically, ungulate species including moose and caribou would have been prevalent within the forests that were flooded to create the Revelstoke and Arrow reservoirs. Important impacts to fisher habitat were also noted in this analysis, as well as impacts to habitat for northern river otter, grey wolf, grizzly bears, white-tailed deer, mule deer, and elk (Utzig & Schmidt, 2011:31). The analysis also notes that development of large reservoirs tends to result in habitat fragmentation, which creates barriers to movement for upland terrestrial species. Habitat fragmentation from development of the Revelstoke Dam would likely have impacted grizzly bears, mountain caribou, fisher, badger, bighorn sheep, among other wildlife species. All of these wildlife species are both intrinsically important to the Ktunaxa and have important subsistence, cultural, and spiritual significance. The decline and loss of many species prior to the addition of a 6th generating unit represents a severely impaired biodiversity baseline within the Ktunaxa LSA.

Utzig and Schmidt (2011) characterize what the loss of habitat would have meant for bird species within the Revelstoke and Arrow reservoirs, focusing on impacts to songbirds, shorebirds, waterbirds, and wader species that use lowland water bodies and the shoreline/upland habitat interface. As described in Section 4.6.2.2.1 of the Revelstoke Unit 6 EA, based on the types of habitats inundated, species that likely experienced very high impacts due to hydro-electric development within the Columbia basin are bufflehead (*Bucephala albeola*), hooded merganser (*Lophodytes cucullatus*), pied-billed grebe (*Podilymbus podiceps*), sora (*Porzana carolina*), American bittern (*Botaurus lentiginosus*), western grebe (*Aechmophorus occidentalis*), eared grebe (*Podiceps nigricollis*), red-necked grebe (*Podiceps grisegena*), horned grebe (*Podiceps auritus*), and common yellowthroat (*Geothlypis trichas*) (Utzig and Schmidt 2011). Ktunaxa knowledge holders also noted concern regarding the lack of abundant prey species (small mammals) particularly for owls.

C7.3.1.3.2 Current Wildlife Baseline

Given the situation described above in terms of historical impacts to wildlife and wildlife habitat, the wildlife baseline within the Project LSA is already severely impacted by existing hydro-electric and other developments, and any incremental Project effects to the extent or quality of available habitat for identified culturally important species will be understood to be a significant effect.

As reported in Section 4.7 of the Revelstoke Unit 6 EA, five ungulate species are found within the Generation LSA, including rocky mountain elk, mountain caribou, moose, mule deer, and white-tailed deer. Grizzly bears are found within the Generation LSA, as are various species of furbearers and birds (Section 4.6). Because the Generation LSA is focused on the Arrow reservoir, little information is available on existing baseline conditions for ungulate species, grizzly bears, furbearers and birds living within the Revelstoke reservoir. Given that current impacts to habitat within the Revelstoke reservoir are already high and significant, Ktunaxa citizens and technical advisors are concerned that any further impacts to the system would not be sustainable for these species populations.

Mountain caribou: As described on p. 15 of Section 4.7 of the Revelstoke Unit 6 EA, mountain caribou use low elevation forests during the early winter and at times during the spring and summer. Based on the Environment Canada Recovery Strategy for Mountain Caribou, 6,348 ha of critical habitat for mountain caribou occurs within the Generation LSA (Environment Canada 2014). Provincially, 107.5 ha of caribou no-harvest ungulate winter range (UWR) is present within the LSA. Figure 4.7-5 indicates that high valued range occurs both along the eastern side of the Arrow reservoir, as well as north of the

Revelstoke Dam along the Revelstoke reservoir. Ktunaxa citizens indicate that caribou regularly used the flats along both the Revelstoke and Arrow reservoirs in the past, and that development of the reservoirs severely impacted their ability to move through the area.

> *[Because of industrial development in the area, there's] fewer animals - they've really affected the caribou...Affected their movements, their path. Their routes, they're traditional, so the [Caribou] out there in that range are gone, I always think that was part of them. Caribou are affected, the elk are affected - all the big game are affected in the area...Like the region is still pretty rich in good things but there's a reason why the population trickled away... (Y13, April 21, 2016)*

Moose: As described on p. 21 of Section 4.7, moose numbers are thought to be declining in the Revelstoke area, possibly due to hunting pressure, wolf predation, and diminishing habitat suitability. Ungulate winter range occurs along both the east and west sides of the Arrow reservoir (Figure 4.7-6) and moose have been seen using the DDZ, which provides spring and summer foraging opportunities where appropriate browse cover can establish and persist.

Rocky mountain elk: As described on p. 21 of Section 4.7, elk exist in relatively high numbers in the Upper Arrow Reservoir and around Revelstoke Reservoir, and have been detected within the DDZ of the MCR, which provides spring and summer foraging opportunities where the flood regime allows appropriate browse species to establish and persist. As noted in the quote above, Ktunaxa citizens have observed impacts to elk from dam development in the Ktunaxa LSA.

Mule deer: As described on p. 22 of Section 4.7, UWR for mule deer has been delineated along both sides of the Arrow Reservoir, from the Revelstoke dam south to the Beaton Arm. Deer tracks have been observed within the DDZ of the MCR, which again provides spring and summer foraging opportunities where appropriate vegetation can persist.

White-tailed deer: As described on p. 22 of Section 4.7, white-tailed deer occur within the DDZ of the MCR.

> *[Deer habitat in the Flats area, south of Revelstoke airport] I've seen them and I've, and I know people who have hunted deer out of there… [It's good habitat], they're drawn to it, right? It's cold. It's water. They'll always go to water… it's not usually always covered in water all the time...like if the water levels are higher [the impact to deer habitat here could be a concern]. (Y13, April 21, 2016)*

Grizzly bears: p. 14 of Section 4.7 describes the presence of grizzly bears in the Generation LSA. As described in this section, grizzly bears have been documented using the DDZ of the Arrow Lakes reservoir. Ktunaxa citizens expressed concerns that higher erosion risks within the MCR could impact habitat for grizzly bears and other animals.

Furbearers: Table 4.7-7 on p. 23 of Section 4.7 lists furbearers that are known or likely to use the Generation LSA. Of these species, the ones most closely associated with aquatic and shoreline habitats are American beaver, muskrat, North American river otter, American mink, and raccoon.

Migratory birds and waterfowl:

Despite the simplified and degraded vegetation that occurs within the DDZ, wetlands and shoreline habitat along the Arrow reservoir provide habitat for songbirds, shorebirds, waders and waterfowl. Efforts to understand the current baseline for these species are ongoing within the Arrow reservoir DDZ, as described on p. 12-13 of Section 4.6 of the Revelstoke Unit 6 EA. Ongoing monitoring efforts are driven by the concern that typical reservoir operations have water levels quickly rising between May and early

July, when most bird species nest. In general, studies conducted to date appear to show that fluctuating reservoir levels are correlated with use at some sites, with some wetland areas in particular avoided when reservoir levels are above 436 MASL. Any changes to the timing of wetland inundation in spring or water level drops in fall could have important impacts on nesting (spring) and migrating (fall) birds. Rapid fluctuations in water levels and velocities (such as those predicted with increased hydropeaking) would be expected to have disproportionate impacts on birds feeding in shallow water, such as dabbling ducks, herons, bitterns, etc. Wetlands at lower elevations within the Arrow Reservoir (e.g., Cartier Bay) are at higher risk from changes in inundation with the addition of the 6th generating unit.

During fieldwork conducted for the Revelstoke Unit 6 EA, Ktunaxa citizens expressed concerns that culturally important birds that would have been consumed in the past are not available in sufficient numbers to allow for hunting.

> *Can't even hunt the geese here [at airport marsh] or the ducks. You'd think they'd be all over in wetlands like this. (S10, August 19, 2016)*

C7.3.1.4 Culturally Important Fish (Salmon, Sturgeon, Other Fish) and Fish Habitat

C7.3.1.4.1 Pre-Revelstoke Dam Fish Baseline

The construction of the Grand Coulee Dam in the 1930s eliminated anadromous salmon from the upper Columbia River and the Arrow Lakes. The construction of dams have fundamentally altered ecosystem processes that rely on connectivity for nutrient (including marine derived) cycling along the river corridor and for natural demographic and evolutionary processes in fish populations. Prior to the construction of Grand Coulee Dam, chinook (*Oncorhynchus tshawytscha*) and sockeye salmon (*Oncorhynchus nerka*) were culturally important species key to Ktunaxa title, rights and use in the Arrow Lakes and Columbia River upstream from this point. Many Ktunaxa stories and songs focus around the salmon (see section C3 for more on the cultural importance of salmon). Salmon were known to travel as far as Columbia Lake for spawning (Scholz et al. 1985; Bryant and Parkhurst 1950 in Section B 4.2), but also spawned in the mainstem of the Columbia River and in innumerable tributaries between the U.S. border and headwaters at Columbia Lake (Columbia Basin Tribes and First Nations 2015). Their large estimated historic abundance (Universities Consortium on Columbia River Governance 2016) implies that they were keystone species for foodweb productivity, providing nutrient subsidies from marine sources. The entire river and accessible sections of tributaries could be considered salmon "habitat," as the environments would have been used by salmon to complete the various stages of their complex life cycles in freshwater.

In additional to anadromous salmon, white sturgeon and kokanee were also cultural keystones for the Ktunaxa communities on the Columbia River and Arrow Lakes. White sturgeon are endangered and kokanee are heavily impacted in the Revelstoke area largely because of BC Hydro dam operations. Many other species of cultural importance to the Ktunaxa were affected by the dam construction on the Columbia including: rainbow trout, bull trout, burbot, whitefish, northern pikeminnow, and suckers (Section B 4.2). Species assemblages largely shifted from an abundance of riverine species or life histories to pelagic (Section B 4.2). Most of the currently present species are potamodromous, and some species (e.g., yellowfin rainbow trout) were known to undertake long-distance migrations from Arrow Lakes to tributaries far upstream of the present day location of the Revelstoke Dam (Prince 2001). This unique life history of rainbow trout has been lost in the present day river environment. In the river between Arrow Lakes and the Mica Dam, all species would have used riverine habitats and had life history strategies

adapted to a riverine ecosystem. Some sources have reported a trend towards increased abundance of kokanee and bull trout since impoundment in 1984, a decreased abundance of mountain whitefish, and, to a lesser extent, rainbow trout (Utzig and Schmidt 2011); however, abundance is not the only metric of fish population health, as diversity is also an important attribute to conserve. rainbow trout, burbot and bull trout in particular may have had reductions in life history diversity, as life histories of these species have been eliminated or much reduced from their historic abundance due to alterations of connectivity and impoundment (Hagen 2008).

C7.3.1.4.2 Current Fish Baseline

Revelstoke Reservoir: The author of Section B 4.2 states,

Thirteen fish species are confirmed in Revelstoke Reservoir (Table 4.2-5). Commercial, Recreational, and Aboriginal (CRA) fish species include Rainbow Trout, kokanee, Burbot, and Mountain Whitefish. The only listed species, Bull Trout, is both provincially blue-listed and a CRA species. All fish species currently on record are indigenous to the Local Study Area. The change from a strictly riverine to more lacustrine environment with impoundment has favoured pelagic species, particularly in the lower section of the reservoir. With the exception of Rainbow Trout, all CRA species spawn in the fall or winter (September-January). Rainbow Trout and all non-CRA species spawn in spring (May-June)." (p21)

These species include:

- Kokanee
- Rainbow trout
- Bull trout
- Mountain whitefish
- Burbot
- Longnose sucker
- Largescale sucker
- Redside shiner
- Peamouth
- Northern pikeminnow
- Prickly sculpin
- Torrent sculpin
- Slimy sculpin

Bull trout is the only species noted in the Reservoir that is either provincially or federally listed. Bull trout in the BC Interior are blue-listed (S3/S4 –Vulnerable/Apparently Secure) by the province of British Columbia and as "Not at Risk" by COSEWIC.

The Mid Columbia section of the study area includes the upper portions of the Arrow Lake up to the Revelstoke Dam. This area (ie., upstream of Arrowhead) was originally a riverine system that was free flowing prior to impoundment of Arrow Lake, beginning in 1968. See description above for ecological change and pre-development baseline.

The author of Section B 4.2 states, with respect to the Mid Columbia River:

Prior to dam construction, the Mid Columbia River was a relatively small portion of the extensive riverine section of the Columbia River upstream of Arrow Lakes. With three successive dams (HKL, Mica, and Revelstoke) built within fifteen years on the mainstem Columbia River, the MCR is not only highly regulated but is now the upstream limit of migration and the only large river habitat available for fish in the ALR system (Subsection B 4.2, p. 42).

Given this unique importance, the MCR is of critical importance as a habitat for fish generally, and for the future restoration of migratory salmon to the Columbia River. Chinook and sockeye are not currently present in the MCR because of industrial water regulation, but numerous efforts are being made to restore salmon to currently vacant salmon spawning areas and restore connectivity within the Columbia system. From a Ktunaxa perspective, the Ktunaxa have lost access to anadromous salmon (as noted above), while salmon may not currently be returning to the MCR, they will in the future, and when they do, the condition of salmon habitat in the region will be of critical importance.

White sturgeon, which were historically distributed throughout the Columbia River, are presently listed as critically imperiled by the BC CDC and endangered under the Species at Risk Act. It is unknown if remnant populations of white sturgeon continue to be present in the Revelstoke Reservoir, but the focus of restoration activities and listing status under SARA has been on: (i) the population component downstream of Keenleyside Dam; and (ii) secondarily, the population component and associated habitats in the Arrow Lakes and the Columbia River upstream to the Revelstoke Dam (see section B 4.2.2.3). White sturgeon, like salmon are a cultural keystone species.

See subsection B4.2 and associated baselines for a detailed description of the current status of fish and fish habitat in the Project LSA and RSA.

C7.3.2 Shoreline Erosion and Sedimentation

C7.3.2.1 Ktunaxa Thresholds of Acceptable Change for Sediment and Shoreline Erosion

Based on observations from Ktunaxa knowledge holders and input from technical advisors, the threshold of acceptable change for the purpose of this assessment is no further deviation from natural geomorphological processes for shoreline erosion or sediment transport within the DDZ.

C7.3.2.2 Shoreline Erosion and Sedimentation Baseline

Maintaining productive soil is a critical component of maintaining functioning terrestrial ecosystems. Under current dam operation, silt located along the Mid Columbia reach is typically moved through the system and ultimately deposited in the Arrow Reservoir. The movement of suspended sediments through the system is effectively a permanent loss of productive soil from the MCR, as the Revelstoke dam prevents soil from moving downstream from the Revelstoke reservoir into the Mid Columbia. The dam provides a combination of anthropogenic acceleration in some areas and barriers in others. This contributes to anthropogenic disruption of the natural processes of erosion and sedimentation.

Little information is currently available on soil erosion risks in Section 4.1.3 of the Revelstoke Unit 6 EA; however, Ktunaxa knowledge holders have observed patterns of erosion within the upper part of the MCR that indicate an ongoing loss of soil within the system, including at Big Eddy Side Channel, Downie Marsh, Locke Creek, and Cartier Marsh.

> *Well, you can see, every time the water level comes up, look at all the clays it's removing, so every time when the water comes up, give this twenty years and come back and have a look at this place, take a shot of this, in twenty years take another shot. So it's gonna have a big effect, that other turbine. Maybe the water might go a little higher, because you've got the extra turbine, but as you can see already, look at all that the dam is doing. And this place has been studied to death from what I've heard, a lot of people did studies on this area here. (Y01, August 18, 2016)*

> *You have to find a way to stabilize this [lakeshore/sediments] down. Like what kind of a plan, for being able to withstand the up and down of the reservoir? Like [proper name] was saying, all the clay and the mud is just getting washed down and the remains were found in here. There was a jawbone of a human, so that's gonna keep coming up every time the water levels are drawing up and down, and these grounds need to be stabilized, either by being rock or plants, I don't know what kind of plants, sedges might work, cattail. We need to find the rice, that will probably be a good one, the wild rice they keep talking about. (S10, August 18, 2016)*

Increased water velocity combined with increased water levels and increased shear stress from the addition of a 6th generating unit will increase the risk of erosion within many portions of the MCR (see erosion models in Section B). At the time of writing, it is unclear how or if BC Hydro's modeling addresses the combined effects of increased fluvial erosion and increased freeze-thaw cycling anticipated from the Project.

C7.3.3 Archaeology Baseline

Archaeology is important for Ktunaxa from a cultural and spiritual perspective (see sub-section C3 TKL), in addition to the scientific technical understanding. See baseline outlined in Section B7.

C7.4 Lands and Resources Sector Anticipated Project Effects

C7.4.1 Revelstoke Dam Operations and Impacts to Lands and Resources Valued Components

> *I tell people, I said, "You know what? Ktunaxa had everything in [Ktunaxa ʔamakʔis]. We didn't have to go over here. We didn't have to go over here. We had everything. We had fish. What species you want?" "Well, what's on the menu tonight?" We could have had salmon, we could have had kokanee, we could have had trout, a couple different types of trout...Burbot...we had everything. We had elk. We had moose. We had deer…(Y05, April 16, 2016)*

Previous assessments have identified increased water level fluctuations and water velocity as the two dominant impacts to ecosystems, plants, wildlife, and aquatic life within storage reservoir systems like the Revelstoke reservoir and the Arrow reservoir and the remaining riverine areas. Revelstoke dam operating practices affect water level fluctuations (both daily and seasonally) within the Revelstoke reservoir, and water velocities within the MCR. Operating practices also directly affect water levels in the Arrow reservoir although the Hugh Keenleyside Dam has a pervasive effect on Arrow reservoir.

Revelstoke reservoir drawdown: Under normal operations, the maximum elevation of the Revelstoke reservoir is 573.02 m (1,880 ft), and the minimum elevation is 571.5 m (1,875 ft), with a fluctuation of 1.82 m (5 ft). Under emergency conditions, the reservoir can be drafted to 568.8 m (1,866.14 ft) and under extreme emergencies it can be drafted to 557.80 (1,830 ft). The maximum drawdown under emergency conditions is therefore 15.22 m (50 ft) (see summary in Table 1.2-3, p. 18 in Revelstoke Unit 6 EA, Section 1.2 Part A). As stated in Section 1.2 of the Revelstoke Unit 6 EA, the addition of a 6th generating unit will allow for additional water (24% more water or 18,000 cfs) to be used to generate more electricity, allowing the plant to produce more power at any given moment (p. 19 in Revelstoke Unit 6 EA, Section 1.2 Part A). The Revelstoke reservoir's current operating range (571 m to 573 m) would remain unchanged and daily fluctuations would be similar (within 1.5 m of maximum elevation of 573.0 m). On rare occasions during the winter, daily fluctuations could increase to 1.7 m when local inflows are low. In addition, when both the Mica dam and the Revelstoke dam are operating at full output, additional water will be withdrawn from storage in the Revelstoke reservoir to compensate for the greater hydraulic capacity of the Revelstoke dam. This water would be replaced overnight when Revelstoke is running at low output.

Upper Arrow reservoir (Mid Columbia Reach) water velocity:

Adding a 6th generating unit will result in an increase in the maximum discharge capability of the plant from the current 75,000 cfs to 93,000 cfs. The majority of maximum flows will occur within periods of peak demand, and this will increase river elevation levels and velocities immediately below the dam.

As explained in Section 4.3.3.1.1.2 of the Revelstoke Unit 6 EA, changes in the amount of water released from the Revelstoke dam are anticipated to result in changes to peak river levels downstream. Changes to peak river levels generally attenuates greatly with increasing distance from the dam, but it is also influenced by topographic constraints at a particular site and is greatly affected by the elevation of the Arrow reservoir. When the Arrow reservoir is nearing full pool (approaching 440 MASL), fluctuations in water levels associated with daily flow releases would attenuate quickly downstream from the dam, whereas lower reservoir elevations (e.g., 430 MASL) could result in more noticeable temporary changes

in water elevations that would continue to be measureable much further downstream (Section 4.1.1, Hydrology and Fluvial Geomorphology).

Despite the anticipated changes in peak river levels, based on hydrological modelling, the proponent has put forward no scenarios in which the maximum water elevation for the Arrow Lakes reservoir will increase beyond the current operating limit (p. 44 of Section 4.3). Under these assumptions, the Proponent does not anticipate changes to the extent of the current DDZ.

C7.4.2 Biodiversity Anticipated Project Effects

C7.4.2.1 Culturally Important Terrestrial Ecosystems, Habitats and Plants Anticipated Project Effects

Section 4.3.3.1.1.2 of the Revelstoke Unit 6 EA describes the anticipated impacts of the addition of a 6th generating unit on ecosystems within the MCR DDZ, including an analysis of impacts to ecological communities at risk and sensitive ecosystems.

Ecological communities at risk: The unavoidable increase in peak flows (especially in winter) and the resulting increased erosion potential will have incremental adverse effects on rare and critical wetland, floodplain, and riparian habitats. Ktunaxa technical advisors consider riparian cottonwood and old forest ecological communities at risk, due to past loss and degradation. They are concerned that incremental impacts caused by increased erosion, leading to incremental vegetation loss and tree failure, coupled with greater windthrow, snowpress as well as microclimatic and biotic edge effects (i.e., changes in soil moisture, temperature, relative humidity; susceptibility to diseases, insects, invasive species encroachment. etc.) may occur in valuable remnant stands of riparian cottonwood and old forest adjacent to the DDZ, or in neighboring upland forests. Potential risks to old growth forests, the locations of which within the LSA are shown in Figure 4.3-7, p. 23 (Revelstoke Unit 6 EA), are not assessed in section 4.3. Impacts to upland forests and ecosystems (which may also be affected by incremental erosion and other cascading effects) are not well understood, nor are these ecosystem types assessed in section 4.3. It is not known whether any ecological communities at risk are found in the LSA (in areas within or adjacent to the DDZ), as no field verification of the PEM was conducted (and 637 ha of the PEM, including some old forest and cottonwood riparian areas were missing). The Nine Mile moss grass site may be impacted by increased erosion, and the potential for moss grass (or other listed plant species) impacts elsewhere was not addressed, as no listed plant surveys were conducted for this assessment.

Sensitive ecosystems: The unavoidable increase in peak flows (especially in winter) and the resulting increased erosion potential will have incremental adverse effects on sensitive ecosystems, including wetland complexes at Airport Marsh, Lower Airport Marsh (and Locks Creek), Montana Slough, Cartier Bay and Downie Marsh, as well as other wetland and riparian communities (not named or explicitly evaluated in the assessment) and adjacent forested ecosystems. Increased erosion potential will lead to incremental loss of soil, sediment, vegetation, tree failure, coupled with greater potential for windthrow, snowpress as well as microclimatic and biotic edge effects. From the Ktunaxa perspective, even small incremental impacts to these existing ecosystems on a very local scale have the potential to measurably reduce the function and resilience of those local ecosystems. Furthermore, incremental effects may interact with historical effects contribute to a significant adverse Project effect. Since so much of the LSA has already been severely impacted by legacy effects, the loss and degradation of any area — no matter how small — would be considered a significant Project effect from the Ktunaxa's perspective.

Culturally Important Plants: The unavoidable increase in peak flows (especially in winter) and the resulting increased erosion potential will have incremental adverse effects on remnant ecosystems that contain culturally important plants. Culturally important plants are assessed within Section 4.4 of the Revelstoke 6 EA, which notes that cottonwood and red-osier dogwood have been documented within the DDZ, partially as a result of revegetation efforts, which have had mixed success for cottonwood (dogwood survivorship was not quantified). The assessment concludes that small differences shown in the modelling between five and six units will not be enough to have a measurable effect that changes the current cycles of inundation. Ktunaxa technical advisors note that remnant culturally important plants are severely impacted within the DDZ and most did not successfully re-establish post-dam impact. Those that remain are primarily found within remnant upland conifer and upland mixed forest ecosystems. Due to limited access to these culturally important plants, any incremental adverse impact to these ecosystems is considered significant from the perspective of Ktunaxa technical advisors. Furthermore, advisors are concerned about the risk of an increased DDZ and potential incremental impacts to culturally important plants found adjacent to the DDZ and within adjacent upland ecosystems. Impacts due to changes in reservoir levels associated with the addition of a 6th generating unit are currently not considered within Section B of this Revelstoke 6 EA. Ktunaxa knowledge holders understand the various interconnections between riparian shoreline areas and adjacent ecosystems. In 2016 during a field visit to the project area, Ktunaxa knowledge holders describe the role of bears and other wildlife to move salmon (and the nutrients they provide) upland. Ktunaxa technical advisors are concerned about impaired riparian structure, function and processes and further changes to microclimate (soil moisture, temperature, relative humidity), biotic edge effects (increased vegetation loss and tree failure resulting from changes in erosion, windthrow, snowpress, susceptibility to invasive insects, diseases and invasive species, etc.), and ecosystem processes (such as pollination, herbivory, seed dispersal, nutrient and carbon cycling, etc.).

In terms of erosion risk due to higher water velocities, Ktunaxa technical advisors are concerned that during peak generation times, additional erosion is likely due to higher water velocities in the upper part of the MCR. This may particularly affect lower elevation wetlands near the upper part of the MCR, including Big Eddy and Downie Marsh. Ktunaxa technical advisors and knowledge holders (CORE process meeting 2015; 2016; field interviews August 2016) have noted ongoing erosion in these areas already, and are concerned that the hydrological model results underestimate the likelihood of erosion increasing after the addition of a 6th generating unit, especially considering the interaction of project effects with other environmental factors such as climate change and freezing/thawing cycles. As shown in Tables 4.3-21 to 4.3-23, more of the area is subjected to high/very high erosion risk when the MCR is at low levels (i.e., during drier years).

In terms of inundation risk, Ktunaxa technical advisors noted that longer periods of inundation and increased fluctuations in water levels due to increased peaking are likely to further inhibit ecosystem productivity along the MCR, thereby limiting diversity and decreasing the likelihood that restoration will be successful in promoting development of more natural vegetation communities in these areas over time. Based on model results, incremental increases in inundation risk generally occur during drier years, which are more likely to occur and become more extreme as climate change progresses in this area. Model results may therefore underestimate these risks for sensitive ecosystems in the DDZ. For example, the higher risk of inundation at Downie Marsh (which shows a 0.4% increase in inundation for May in dry years with 6 units; p. 50 in Table 4.3-12, of Section 4.3), though slight, represents an incremental increase in impact to an ecosystem that is already well beyond the established Ktunaxa threshold for

biodiversity impacts. Due to the already impaired baseline, any incremental Project effect, even a low magnitude effect that is difficult to measure within the DDZ, is considered significant (by exacerbating existing adverse effects to Ktunaxa practice of title, rights and interests).

Note that the analyses in Sections 4.3 and 4.4 do not look at potential impacts to ecosystems and plants within the Revelstoke reservoir. Though changes are expected to be small in this area, incremental impacts from changes in water levels and flow rates may impact ecosystems, habitats and plants. Given the highly impacted baseline of the Revelstoke reservoir compared to pre-dam conditions, Ktunaxa knowledge holders perceive a potential incremental effect in the Revelstoke DDZ with adverse effects to culturally important plants.

Ecological Communities at Risk: Section 4.3.3.1.1.2

BC Hydro Perspective	Ktunaxa Perspective
No change is expected to abundance, distribution or condition of ecological communities at risk. Operating with 6 units compared to 5 will not change the current operating limit for maximum water elevation in the Arrow lakes Reservoir. Any change in water levels associated with operating 6 units will thus occur within the current DDZ. Since there are no ecological communities at risk within the DDZ, no effects are anticipated.	If the Project is built, the resulting increase in peak flows (especially in winter) and the resulting increased erosion potential will have incremental adverse effects on rare and critical wetland, floodplain, and riparian habitats. The Dam Footprint Impact studies summarized in Utzig and Schmidt (2011) concluded that as a result of BC Hydro development, the majority of highly productive and extremely valuable wetland and riparian communities (i.e., wet and very wet forests, cottonwood bottomlands, floodplains, etc.) have already been irreversibly lost from this system. Therefore, any further incremental losses and/or degradation to these habitats and their dependent species that remain (e.g., fish, amphibians, waterbirds, songbirds, carnivores, furbearers, bats and aerial insectivores) must be considered significant. Incremental impacts to remnant habitats within and adjacent to the DDZ may also occur via increased erosion, leading to incremental vegetation loss and tree failure, changes to microclimate, biotic edge effects and ecosystem processes. Ktunaxa technical advisors are also concerned about how predicted changes affect upland at-risk ecosystems, and remain uncertain about whether incremental impacts to these ecosystems will occur. Within the context of the highly impacted system at the Revelstoke 5 baseline, any further loss of ecological communities at risk as a result of the Project is considered a significant adverse effect. It is not known whether any ecological communities at risk are found in the LSA (in areas within or adjacent to the DDZ), as no field verification of the PEM was conducted (and 637 ha of the PEM, including some old forest and cottonwood riparian areas were missing). The Nine Mile moss grass site may be impacted by increased erosion, and the potential for moss grass (or other listed plant species) impacts elsewhere was not addressed, as no listed plant surveys were conducted for this assessment.

Sensitive Ecosystems: Section 4.3.3.1.1.2

BC Hydro Perspective	Ktunaxa Perspective
The assessment points to the large variation that occurs between years in terms of water levels within the Arrow Lakes reservoir to argue for no impact to the abundance, distribution or condition of sensitive ecosystems. As stated on p. 44, ecosystems in the DDZ are resilient to current variations in reservoir levels. The predicted increase in inundation occurs for short periods in mid July (Figure 4.3-13) and the assessment concludes that the impacts to sensitive ecosystems will not be significant.	If the Project is built, the resulting increase in peak flows (especially in winter) and the resulting increased erosion potential will have incremental adverse effects on sensitive ecosystems (i.e., wetland, floodplain and riparian forested ecosystems). Potential incremental impacts in and adjacent to the DDZ include loss of soil, sediment, vegetation, tree failure, coupled with changes to microclimate, biotic edge effects, and ecosystem processes. In addition, Ktunaxa technical advisors and knowledge holders anticipate that predicted changes may affect upland sensitive ecosystems. Furthermore, there is great uncertainty going forward about whether modelling an existing wet year (1975) and dry year (1992) can adequately account for the future extremes associated with climate change. As above, within the context of the highly impacted system at the Revelstoke 5 baseline, any further loss of sensitive ecosystems within the DDZ is considered significant.

Culturally Important Plants: Section 4.4.4.1.1.2

BC Hydro Perspective	Ktunaxa Perspective
No impact on the abundance, distribution or condition of the remaining culturally important plants (primarily cottonwood and red-osier dogwood) is expected.	If the Project is built, the resulting increases in water levels, velocities, peak flows and erosion potential will have incremental adverse effects on remnant plant communities within and adjacent to the DDZ that contain culturally important plants. Upland ecosystems containing culturally important plants may also be at greater risk due to changes in microclimate, biotic edge effects, ecosystem processes, and interactions with climate change. Within the context of the highly impacted system at the Revelstoke 5 baseline, any further loss of culturally important plants within the DDZ is considered significant.

C7.4.2.2 Culturally Important Wildlife and Habitat Anticipated Project Effects

The assessment of impacts to wildlife in Section 4.7 focuses on impacts within the Generation LSA, specifically from the following potential impacts:

- Habitat loss due to vegetation removal through land clearing, prolonged inundation and erosion;
- Change in suitable habitat with the addition of invasive species that become established via movement of construction materials, machinery and vehicles;
- Habitat loss and mortality due to the introduction of silt, fuel, lubricant, concrete or other deleterious substances to the environment;
- Exclusion from suitable habitats resulting from loud or visually-disturbing construction activities (e.g., clearing, excavation, artificial lighting) and inundation;
- Mortality to species with limited mobility that are crushed due to increased construction traffic and movement of construction equipment and vegetation clearing; and
- Mortality resulting from inundation due to fluctuations in water levels.

Ktunaxa technical advisors and knowledge holders are concerned about cumulative effects on wildlife both above and below the Revelstoke Dam (i.e., within the Ktunaxa LSA). Legacy effects of past projects will be compounded by increased peaking, water level fluctuations and higher water volumes and

velocities all causing greater erosion and reduced availability and suitability of habitats in the MCR, as well as incremental mortality due to impaired breeding, feeding and daily/seasonal movements. Ktunaxa representatives have repeatedly raised concerns regarding the scope and assessment provided in Section B including impacts to mammals, birds, herptiles and fish, for reasons outlined in the following sections. Where Section B does not provide adequate information to inform Section C, we have made precautionary assumptions in order to complete Section C.

Mammals

As described in Section 4.7.3.1.1.2, changes in the amount of water released from Revelstoke Dam with the addition of the 6th generating unit and additional water licences will result in measurable changes in the frequency of peaking in the river downstream. Impacts to wildlife habitat are likely to be highest during dry years, when peak river levels will fluctuate more substantially at greater distances downstream from the dam. Section 4.7 notes that temporary changes in flooding may displace mammals from foraging sites or result in increased mortality for small mammals unable to escape rising water. Flooding can also inundate bank lodges/dens of furbearers (such as American beaver, American mink and North American river otter, muskrat, etc.), drowning newborn young if it occurs during the breeding season (p. 36 in Section 4.7 of Revelstoke Unit 6 EA). Since no surveys were carried out for any mammals as part of the assessment, it is not possible to estimate these impacts.

Increased peaking frequency is expected to negatively impact terrestrial (e.g., small mammal) and aquatic food chains and hatches of emergent insects that are vital to insectivorous mammals, birds and herptiles, including listed bats (i.e., little brown myotis, northern long-eared myotis) known to use the LSA. There is no mention of this pathway in the assessment, and since no surveys were carried out, it is not possible to estimate user populations and associated impacts to them. Given anticipated decreases to aquatic productivity, incremental adverse Project effects on bats and other aquatic and aerial insectivores.

Section B 4.7 also discusses the potential for physical destabilization of habitat through erosion, a natural occurrence within the MCR. Erosion risk is discussed in section 4.3 (p. 51), based on the model. The analysis shows that at the lowest ALR elevation studied (425 MASL), 35.9 ha of the focal area studied are at higher (moderate – very high) risk of erosion with the addition of a 6th generating unit. At higher reservoir levels, the area at risk of erosion in the focal area studies is lower but still measureable (30.29 ha at 435 MASL; 10.04 at 440 MASL). The analysis in Section 4.3 goes on to suggest that many of the areas that are highest risk of erosion are associated with banks and gravel bars which are not currently vegetated, and that a measureable effect on wildlife habitat is not anticipated based on the following factors:

- the limited amount of area potentially affected (in relation to the amount of habitat within the MCR);
- recognition that erosion is a natural occurrence within the MCR and ecological communities persist in this context; and
- areas potentially affected are not anticipated to affect the large wetland complexes within the MCR (based on location).

From this analysis, Section 4.7 concludes that any incremental loss of wildlife habitat due to erosion is not anticipated to have measureable effects on mammals. However assessment for other Valued Components (including archaeology) indicates that there will be a measurable and perceivable increase in erosion due to the Project. As discussed in section C2, erosion modelling in section B does not consider the potential impact of increased freeze/thaw cycles (FTC) within the DDZ, and so existing models are assumed to underestimate the actual rate of anticipated erosion attributable to the Project. Based on Ktunaxa experience with reservoir management effects in the MCR, Ktunaxa technical advisors and knowledge holders anticipate residual adverse Project effects on wildlife habitat including breeding, foraging and seasonal habitats important with respect to listed species (e.g., listed bats, grizzly bear, wolverine, fisher), furbearers and ungulates, particularly caribou.

Ktunaxa technical advisors understand that these impacts interact with incremental increases in winter hydropeaking, velocities, flows, erosion, and the overall timing, frequency, and duration of freeze/thaw cycles ice formation and associated gouging, scouring and shear stress. From a Ktunaxa perspective, the latter is a critical pathway to consider, given the influence of ice formation on the ability of wildlife to successfully forage, breed and move (daily and seasonally) through various wetland and riparian habitats. It has been well-documented on reservoir systems that ungulates (i.e., mountain caribou, moose, deer and elk) are subject to increased injury and mortality risk due to unstable thin ice that results in cracking and breakage, falls and drownings. This concern has been noted on several hydro dams in south-central BC (e.g., Seven Mile and Waneta Dams) and is presumably also a problem on the MCR and Revelstoke reservoirs, which are known to experience freezing and thawing cycles. Drowning risk can also be an issue for some furbearers (e.g., wolverine, fisher, etc.), as well as smaller mammals.

Birds

Section B 4.6 discusses impacts to birds from the addition of the 6th generating unit. It acknowledges that there is a risk of nest loss; this risk is also present now, and is greatly influenced by how quickly the Arrow reservoir rises and the timing of nesting, which tends to peak in early June but varies, depending on species-specific breeding schedules and the timing of the spring thaw. The model indicates measurable differences in water depth and greater peaking amplitude with 6 units compared to 5. Small but measureable incremental changes in the total area and timing of inundation are predicted in certain areas studied (e.g., Locks Creek, Cartier Bay), however this is not interpreted to have any impacts on the range of bird species considered in those areas. The availability of habitat for nesting birds in the fall depends on the elevation of the Arrow reservoir; differences between units 5 and 6 are more pronounced when the reservoir is lower in elevation, but, as pointed out on p. 53 of Section 4.6, considerably less when considering the variability between the wet and dry modelled years. The assessment concludes that there should be no measurable difference to the listed bird, raptor and migratory bird VCs because of the (a) high variability in Arrow Lakes water levels is far greater than the differences observed between five and six units in operation, (b) most incremental habitat is flooded either earlier or later in growing season outside of the peak nesting period in unvegetated or grassland habitats, so there is “almost no detectable

difference (0.06485 nests) to nest mortality at Cartier bay, one of the sites modeled", and (c) that increased erosion will impact mostly unvegetated riverine bank and grassland areas (with comparatively lower nest densities and species richness and abundance)[10]. The assessment focuses exclusively on common species found nesting locally and it does not consider displacement of birds (especially listed bird species, raptor species, and migratory bird species) from foraging areas.

Ktunaxa technical advisors understand that in the case of listed species, the assessment (and/or the BBA and other sources) acknowledges that there are confirmed previous and/or current nesting and/or foraging records in the DDZ and/or LSA of the MCR for great blue heron, short-eared owl, common nighthawk, bobolink, barn swallow, bank swallow, olive-sided flycatcher, American avocet, black swift and double-crested cormorant. It is understood by Ktunaxa technical advisors that impacts of incremental increases in flooding, water depth, frequency/duration of inundation and erosion may contribute to the displacement, breeding and foraging activity and/or success of these species.

The Section B assessment acknowledges that nest flooding impacts occur in unvegetated, grassland and other low-lying wetland sites, and that a measurable increase (0.06485 nests) in migratory nest flooding was predicted by the model at the few sites looked at. While not discussed in Section B, it is understood by Ktunaxa technical advisors that the detectable and measurable increase in nest flooding applies across the DDZ of the MCR as a whole to nests of listed species (e.g., common nighthawk, short-eared owl, bank swallow, American avocet, etc.). In the absence of data, this Section C assessment applies the precautionary principle to understand the implications of increased nest flooding to ground-nesting migratory raptors (like northern harrier), or to low-nesting ground or bank-nesting migratory species (like savannah sparrow, spotted sandpiper, and belted kingfisher) across the DDZ of the MCR as a whole. Since WUP studies were only able to account for the fate of 37.7% of migratory nests monitored, and 62.3% of nests monitored had an unknown outcome, it seem reasonable to assume that: (a) actual nest losses are higher than the conservative estimates in the model based only on nests of known fate, and (b) some of the 62.3% of nests of unknown fate were flooded and/or their contents suffered mortality.[11]

The assessment acknowledges that fluctuating reservoir levels are correlated with bird use at most sites, and that small changes in water depth influence foraging habitat availability and success for some species (e.g., dabbling ducks). Using herons as an example to evaluate incremental foraging impacts on listed species, it is known that herons require undisturbed, slow-moving, shallow (<0.7 m) ice-free watercourses to feed successfully, and such sites are limited in the MCR. Therefore, a small increase in water depth and velocity can effectively render large areas of potential foraging habitat unsuitable for herons. Therefore, predicted incremental increases in water levels, inundation and habitat flooding, peaking and erosion would be expected to impact foraging habitat availability and success for herons (as was also demonstrated for dabbling ducks; Van Oort and Cooper 2015), and suggested for species with

[10] Ktunaxa technical advisors do not agree with the assessment scope and interpretations related to Project effects on birds based on model results and other data as presented.

[11] Model estimates have not being applied to the DDZ and MCR as a whole, or to all susceptible nesting species in Section B this work should be undertaken.

narrow requirements for foraging depths (e.g., ospreys, belted kingfishers, etc). It is perhaps for this reason that ospreys were observed to have extremely low levels of nest success in the LSA, relative to ospreys elsewhere in the Columbia Basin. Van Oort et al. (2014, 2015) suggests that ospreys may be impacted by reservoir operations (possibly influencing the ability of osprey parents to capture fish and provision their young), but that more data is needed to confirm the relationship. This concern should be further investigated for ospreys, nor for herons, dabbling ducks, and other species on the MCR, because it is very relevant to determining impacts of a 6th generating unit on listed species, raptors and migratory birds.

In addition to only being able to forage in very shallow water, herons are highly sensitive to disturbance (i.e., people, dogs, cars, ATVs, predators, etc.), and there is potential for synergistic negative interactions between incremental physical changes and disturbance agents with a 6th generating unit. Such interactions could further displace herons and impair their foraging habitat availability and success. Finally, more herons are remaining in the basin year-round (likely as a result of climate change associated with warmer winter temperatures) and shallow, ice-free feeding sites are critical to permit successful foraging during vulnerable winter months. It is the understanding of Ktunaxa technical experts that incremental increases in winter hydro-peaking, velocities, flows, water depths and erosion are linked to the overall timing, frequency, and duration of freeze/thaw cycles, ice formation, and availability and suitability of habitat for herons. Other listed/rare species such as American avocet, common nighthawk, short-eared owl and northern harrier (an invertivore, an aerial insectivore, and two small mammal specialists, respectively) all forage in open lowland habitats and they and their prey would be likely to suffer impacts of increased water velocities, flows, water depths and erosion[12].

The assessment states that “most incremental habitat is flooded either earlier or later in growing season outside of the peak nesting period”. It is the understanding of Ktunaxa technical advisors that the nesting period for listed species ranges from as early as March for great blue herons to as late as August for common nighthawks, hence they would indeed be affected during this larger time window. Furthermore, waterfowl, shorebirds and other migratory species use areas with incremental flooding during spring and fall and availability and use of suitable habitats is largely determined by the timing of ice melting and formation, respectively. Although the link between incremental increases in winter hydropeaking, water velocities, flows and erosion with the overall timing, frequency and duration of freeze/thaw cycles and the processes of ice formation and erosion, gouging, scouring and shear stress is not considered for birds (or other wildlife) in Section B of this assessment, Ktunaxa technical advisors understand this to be an important factor.

Increased flows, inundation and peaking frequency is expected to negatively impact aquatic food chains (i.e., aquatic plants and invertebrates) that are vital for birds, some of which feed on hatches of emergent aquatic insects and are known to forage in the DDZ (e.g., common nighthawk, barn swallow, bank swallow, etc.). There is no mention of this pathway in Section B assessment, and no studies were carried

[12] These pathways are not addressed in the Section B assessment but require additional investigation.

out to estimate user populations, insect populations, or possible impacts. In the absence of adequate information, Section C will take a precautionary approach to account for this potential project impact pathway.

Herptiles

Section 4.5 summarises assessments results on the herptile VC (i.e., listed herptile species and presence, quality, quantity of habitat for listed herptiles). It concludes that while there are detectible differences in the peaking of water with six units compared to five, variability in the operations of the Arrow Reservoir is far greater than these differences. Also, herptiles "persist" within the MCR, and western toads (the most abundant amphibian species documented) are well-distributed within the MCR (Hawkes et al 2015), so addition of the 6th generating unit is not expected to result in a measurable change to the VC indicators.

The Section B assessment for amphibians focuses almost entirely on western toad (a terrestrial species outside of the breeding period). Ktunaxa technical experts and knowledge holders understand that aquatic amphibian species (i.e., Columbia spotted frog, Pacific chorus frog and long-toed salamander) are likely to be impacted year-round by the predicted operational changes. Interestingly, monitoring in the Columbia Basin shows that these aquatic amphibians are generally found at much higher abundances than western toad in basin wetlands, whereas MCR shows the opposite pattern, with aquatic species inconsistent and at very low numbers. Hawkes et al. (2015a) do question if herptile populations in MCR are suppressed relative to populations in other sites away from reservoir operations, and this concern requires investigation and additional study. In the absence of adequate analysis or baseline studies of aquatic herptiles in Section B, this Section C assessment will take a precautionary approach and account for a potential project effects on aquatic herptile populations.

The assessment acknowledges a relationship between herptile distributions in the DDZ as a function of habitat availability, which is affected by reservoir elevation and time of year. Habitat availability diminishes as Arrow Reservoir rises. Change is most marked in the spring, when breeding sites are inundated in May and June, which corresponds with the typical period for larval development. Numbers of herptile observations decreased as reservoir elevations increased, and often no species (either eggs, tadpoles, toadlets or froglets) were found at sites in the later stages of summer when elevations were high (Hawkes et al. 2015a). For western toad specifically, the assessment states that (a) it is "uncertain if temporary flooding associated with peak river levels displaces amphibians from suitable habitats or results in egg or tadpole mortality", (b) incremental increases in flooding from peaking with six units compared to five may further slow tadpole development and change tadpole behaviour, which may delay metamorphosis and possibly decrease survival (Hawkes et al 2015a), and (c) "inundation in Kinbasket Reservoir reduces water temperature and dissolved oxygen, leading to smaller toadlets and slower metamorphosis compared to other locations, but long term effects are unknown, and there is no similar data for MCR". No western toad (or other herptile) data was collected for this assessment, nor were incremental effects of erosion, scouring, gouging and sheer stress meaningfully considered on herptiles. In the absence of these data a precautionary approach has been taken.

Ktunaxa technical advisors understand that the physical changes predicted above with addition of a 6th generating unit have the potential to destabilise amphibian egg masses, increase egg and larval mortality, reduce rates of metamorphosis, reduce sizes of adults, and result in lower reproductive success. Herptile breeding and foraging habitat availability and use is likely to decrease incrementally based on the

predicted physical changes associated with a 6th generating unit, as is abundance of available food (i.e., aquatic and terrestrial insects, aquatic vegetation). Because the latter pathways were not considered, nor was the effect of the changed operating regime on the timing, frequency and duration of freeze-thaw cycles and ice formation (which influence periods of herptile activity and availability of breeding/feeding habitats and resources), Section C takes a precautionary approach and considers these impact pathways.

Timing of listed painted turtle submergence and re-emergence in fall and spring is closely tied to the phenology of ice formation and thawing, respectively. The assessment in Section B does not consider how the change in operating regime may influence freeze thaw cycles. Furthermore, access to food resources and foraging success for turtles (and many wildlife species) is understood to also be linked to ice formation, something that requires further evaluation. Turtles apparently shift their movements to higher elevation bands after inundation occurs (Wood and Hawkes 2014), which may predispose them to a greater risk of mortality, disturbance, and persecution, because of closer proximity to trails, roads, upland ponds and sites frequented by people[13]. The effects of incremental increases in inundation, flows, peaking and erosion on availability of turtle loafing/feeding habitat and prey (i.e., aquatic and terrestrial invertebrates, aquatic vegetation) were not evaluated in Section B, presumably due to a lack of data.

As explained in Section C7.3.1.1, the Columbia River system is already well past any established threshold of acceptable change for biodiversity. In this context, any incremental adverse effect with the addition of a 6th generating unit is considered to be significant by Ktunaxa knowledge holders. Ktunaxa citizens who participated in fieldwork considered that, based on the current level of impacts within the system, and based upon the observed incremental impacts to erosion in the past, there is a high risk of increased erosion with the addition of a 6th generating unit, leading to increased habitat loss (for breeding, foraging and daily/seasonal movements), reduced habitat suitability, and incremental impacts on culturally important and rare wildlife (Y01, field interview, August 18, 2016). With the addition of a 6th generating unit, increases to the timing and extent of inundation, flows and peaking will increase mortality to mammals, birds and herptiles, year-round (breeding, wintering and migration periods). As these changes occur within the context of an ecosystem that is already significantly impacted, Ktunaxa citizens consider any incremental adverse impacts to be significant.

Note that the analyses in Sections 4.5, 4.6, and 4.7 do not look at potential impacts to wildlife and birds within the Revelstoke reservoir. Though changes are expected to be small in these areas, incremental impacts from changes in water levels and flow rates may impact wildlife habitat availability or suitability and increase mortality risk. Given the highly impacted baseline of the Revelstoke reservoir compared to pre-dam, Ktunaxa knowledge holders are concerned that these incremental changes will result in measureable impacts to culturally important wildlife species and their habitats.

[13] These pathways were not considered in the assessment (painted turtle was not explicitly considered in the assessment, although this was one of two listed VCs to be addressed).

Ungulates Including Listed Species (Mountain Caribou): Sections 4.7.3.1.1.2 and 4.7.3.2.1

BC Hydro Perspective	Ktunaxa Perspective
The effects of inundation and erosion associated with the addition of a 6th generating unit are not anticipated to result in measureable effects on occurrences of ungulate species and movement corridors, or ungulate winter forage; therefore, no residual effects are anticipated.	The assessment in Section B did not consider frequency/duration of freeze/thaw cycles and ice formation and stability as a pathway; this is understood to be a critical oversight. Incremental changes predicted based on addition of a 6th generating unit (i.e., increased flows, velocities, inundation, peaking and erosion and changes to freeze/thaw cycles) are expected to influence ungulate mortality risk; habitat availability, suitability and use for feeding and daily/seasonal movements. Any incremental impact to ungulate populations and/or habitats is not sustainable within the context of already high levels of impacts relative to a pre-dam baseline. Within this context, any incremental adverse effects (even if very localised and small) must be considered significant, as these effects will impact on the rights of Ktunaxa citizens in specific areas. Ktunaxa technical advisors remain uncertain about how changes to habitats adjacent to the DDZ (i.e., to microclimatie, biotic edge effects, and ecosystem processes.) may influence ungulate use of specific areas and this requires further evaluation.

Mammals Including Species At Risk (Grizzly Bear, Wolverine, Fisher, and Bat Spp.): Section 4.7.3.2.1

BC Hydro Perspective	Ktunaxa Perspective
Effects of inundation and erosion associated with the addition of a 6th generating unit are not expected to result in measureable effects on occurrences of species at risk or quality and quantity of their suitable habitat. Temporary changes in potential flooding from peaking with a 6th generating unit compared to five units may displace mammals from foraging sites. Any loss of habitat related to erosion is not anticipated to have a measureable effect to the Mammals VC. No specific comments about potential impacts to grizzly bears are made, although they have been observed within the DDZ and are known to use mountain side slopes adjacent to the DDZ.	Incremental changes predicted based on addition of a 6th generating unit (i.e., increased flows, velocities, inundation, peaking and erosion) are expected to influence mammal and SAR habitat availability, suitability and use for breeding/feeding and daily/seasonal movements. Incremental impacts to SAR are of concern to Ktunaxa citizens and data regarding effects to these species is not adequate. The assessment did not consider timing, frequency, and duration of freeze/thaw cycles (and implications for ice formation and stability) as a pathway for mammals at risk, this is considered to be a critical oversight. Ktunaxa technical advisors are concerned that incremental impacts to grizzly bear and SAR populations and/or their habitats are not sustainable within the context of an already high level of impact relative to a pre-dam baseline. Within this context, any incremental impact (even if very localised and small) must be considered significant. Ktunaxa technical advisors remain uncertain about how changes to habitats adjacent to the DDZ (i.e., changes to microclimatic and biotic edge effects) may influence SAR use of specific areas and this requires further evaluation. Ktunaxa technical advisors are concerned about listed bats, their breeding/foraging habitats, and their insect food supply, which were not considered as part of this assessment. These concerns were raised in pre-application technical discussion but they have not been addressed. Section C does not have adequate information to inform assessment of these impacts, so Section C takes a precautionary approach.

Furbearers: Section 4.7.3.1.1.2

BC Hydro Perspective	Ktunaxa Perspective
This section notes that temporary changes in potential flooding from peaking with a 6th generating unit compared to 5 units may displace mammals from foraging sites and could result in mortality of some species that are unable to escape rising water levels (notably small mammals). Flooding may also inundate bank dens of furbearers, resulting in increased drowning risk for newborn young if it occurs during the breeding season. The section goes on to note that current operations are similar and local populations are already subjected to these impacts, and that the detectable differences associated with the 6th generating unit are not expected to have measureable effects on current populations. Physical habitat destabilization due to erosion is also a risk; however, the section states that any loss of habitat related to	Ktunaxa technical advisors understand that incremental changes predicted based on addition of a 6th generating unit (i.e., increased flows, velocities, inundation, peaking and erosion) may influence prey availability and furbearer habitat availability, suitability and use for breeding/feeding and daily/seasonal movements. The assessment does not consider timing, frequency and duration of freeze/thaw cycles and ice formation and stability as a pathway for furbearers; this is considered a critical oversight. Based on the principles of all living things and Ktunaxa rights, adverse impacts to furbearer populations and/or their habitat are not acceptable within the context of an already high levels of impact relative to a pre-dam baseline. Within this context, any incremental adverse impact (even if very localised and small) must be considered significant, as these effects will be felt by families using a specific area. Potential implications of changes to inundation and erosion (levels, frequency and timing) on year-round furbearer habitat availability suitability and use for breeding (i.e., dens) and feeding (i.e., small

BC Hydro Perspective	Ktunaxa Perspective
erosion is not anticipated to have a measureable effect to the Mammals VC.	mammal populations) requires further study. Ktunaxa technical advisors remain uncertain about how changes to habitats adjacent to the DDZ (i.e., changes to microclimatic and biotic edge effects) may influence furbearer use of specific areas and this requires further evaluation.

Birds Including Species At Risk: Section 4.6.3.1.1.2

BC Hydro Perspective	Ktunaxa Perspective
Displacement of birds from foraging/breeding areas and nest loss occurs within current operations and is influenced by how quickly the Arrow Lakes reservoir rises. The timing of early nesting depends on timing of spring thaw. Availability of habitat for migratory birds depends on Arrow reservoir elevation; differences between units 5 and 6 are more pronounced when reservoir is lower in elevation. Assessment concludes no measurable difference to the listed bird, raptor and migratory bird VCs because of (a) high variability in Arrow Lakes water levels which is far greater than the differences between five and six units, (b) most incremental habitat is flooded either earlier or later in growing season outside of the peak nesting period and mainly in unvegetated or grassland habitats, so the measurable difference to nest mortality at select sites modeled is small, and (c) increased erosion impacts mostly unvegetated riverine bank and grassland habitats (with comparatively lower nest densities and species richness).	The Ktunaxa are concerned about incremental increases in the frequency and duration of inundation, erosion and changes to the timing, frequency and duration of freeze/thaw cycles on bird populations; displacement and disturbance; breeding and foraging activity and success; availability, suitability and use of breeding and foraging habitat; and changes to prey availability (culturally important owls are of particular concern). The assessment of impacts in section B is not adequate for section C assessment. Given the predicted physical changes associated with addition of a 6th unit and their timing in the DDZ, Ktunaxa technical advisors predict adverse incremental impacts to selected SAR, raptor and migratory bird populations and their habitats. Ktunaxa technical advisors note that any incremental impacts to bird populations and habitat occur within the context of an already high level of impact relative to a pre-dam baseline. Within this context, any adverse incremental impact must be considered significant.

Herptiles Including Species at Risk: Section 4.5.3.1.1.2

BC Hydro Perspective	Ktunaxa Perspective
This section notes that while there are detectible differences in the peaking of water with six units compared to five, variability in the operations of the Arrow Lakes Reservoir is far greater than these differences. Also, herptiles “persist” within the MCR, and western toads (the most abundant amphibian species documented) are well-distributed within the MCR, so addition of the 6th generating unit is not expected to result in a measurable change to the VC indicators.	The Ktunaxa are concerned about incremental increases in the frequency and duration of inundation, erosion and changes to the timing, frequency and duration of freeze/thaw cycles on herptile populations; displacement and disturbance; breeding and foraging activity and success; and availability, suitability, and use of breeding/foraging habitat and food supply. The scope, data, and interpretation for the herptile assessment is not adequate. Ktunaxa technical advisors feel that physical changes predicted with addition of a 6th generating unit have potential to destabilise amphibian egg masses, increase egg and larval mortality, reduce metamorphosis rates, reduce sizes of adults, and reduce herptile breeding and foraging habitat availability and food supply. Ktunaxa technical advisors note that any incremental adverse impacts to herptile populations and habitat occur within the context of an already high level of impact relative to a pre-dam baseline. Within this context, any adverse incremental impact (no matter how small and localised) must be considered significant.

C7.4.2.3 Fish Anticipated Project Effects

Project operation is expected to produce the following changes in Revelstoke reservoir with the resultant potential biological effects:

- The addition of the 6th generating unit would increase the number of units through which fish could be entrained. This could alter the number of fish (kokanee) entrained and their mortality rates.

- Of particular importance to the Ktunaxa title, rights and interests are the potential effects that these changes may have (increased flow) on early life stage white sturgeon dispersal. White sturgeon are listed as an endangered species under the Species At Risk Act (SARA), and are a cultural keystone species to the Ktunaxa. Although the predicted effect is small, and the change is reversible, the direction of change to this indicator is predicted to be negative, and it involves impacts to critical habitat under SARA. Using a change scaled to the species population level is an inappropriate assessment criterion for an indicator at the larval life stage, as the population suffers recruitment failure, so the assessment methodology will predict negligible effects regardless of the impact to larval dispersal.
- Additionally, the unavoidable increase in water velocity and flow regime as a result of the Project will impact currently vacant anadromous salmon habitat and may jeopardize the potential for anadromous salmon re-introduction in the Mid Columbia River, which is a foreseeable future activity. In particular, the increased velocities and modified flow regime in the Mid Columbia River may decrease the suitability of habitat for spawning through increasing risk of embryo stranding or scouring. BC Hydro has provided no assessment of this effect and considers overall impacts to current fish populations and their habitats to be negligible. Fish species currently using the project area cannot act as a proxy for anadromous salmon, as they have different life histories and habitat requirements. Due to the absence a proper assessment that includes anticipation of salmon re-introduction, Ktunaxa decision-makers have not received adequate information regarding the impacts of the project through this EA process.

C7.4.2.4 Primary Production Anticipated Project Effects

The project is anticipated to affect aquatic primary production in the pelagic zone of the Revelstoke Reservoir through alteration of water residence time and in the littoral zone through changes in the frequency and magnitude of daily water level fluctuations. In particular, littoral productivity is predicted to decrease due to reduction in effective littoral zone and increasing rate of draft under anticipated operational scenarios which may affect exposure of macrophytes to freezing or desiccation (Subsection B 4.2). The estimated magnitude of change in littoral productivity is small, but the direction of change indicates that it is adverse.

In the Mid Columbia River, effects on benthic primary production shown in BC Hydro wet year scenarios indicate a clear net reduction in the productive hours that are necessary for growth in this foundation of the food web. In some months during a wet year scenario, the BC Hydro assessment has indicated up to 27% reduction (maximum value of % change) in productive hours. In addition, the effect of scour from increased velocities was not quantified in any way or factored into the effects assessment. Overall, it appears that there are clear adverse effects that must be considered within the overall context of change in the system.

C7.4.2.5 Biodiversity Mitigations and Actions

Impacts to Ktunaxa values related to biodiversity will be permanent (i.e., from the perspective of Ktunaxa transmission of knowledge and practice related to biodiversity, the disruption will last longer than 25 years and more than a generation) and are not fully mitigable. A summary of recommended mitigations specific to the biodiversity VC is provided in Section C11.

C7.4.2.6 Sediment Loss and Shoreline Erosion Project Effects

As described above, in the absence of mitigations, impacts from the proposed addition of a 6th generating unit on erosion and loss of sediment and soil within the Arrow reservoir are potentially high, due to increases in peak flows as the system requires more movement of water during peak energy use periods to make use of the additional generator or turbine.

Incremental sediment losses and changes in sediment distribution are predicted and will have clear adverse impact on Ktunaxa values including archaeology, wetlands and riparian habitats, and habitat used by mammals, birds, herptiles, and fish, including habitat for white sturgeon. These losses are permanent, and irreversible.

As with the Biodiversity VC, the increased risk of soil loss and sediment losses and re-distribution due to erosion with the addition of a 6th generating unit occurs within a system that is already highly impacted beyond the identified Ktunaxa threshold of acceptable change. In this context, any incremental measureable change is considered to be important to address through specific mitigations and actions.

C7.4.2.7 Recommended Mitigations and Actions

Impacts to Ktunaxa values related to sediment and shoreline erosion will be permanent and likely not mitigable. A summary of recommended mitigations specific to the sediment and shoreline erosion VC is provided in Section C11.

C7.4.2.8 Archaeology Anticipated Project Effects

Results of BC Hydro's hydrology and erosion studies show clear adverse impacts to previously recorded archaeological sites as well as landforms with the potential to contain archaeological material. Archaeological sites and material are an important aspect of Ktunaxa cultural heritage. Adverse impacts to archaeological sites and material will further erode Ktunaxa connection to the Columbia River region as well as ability to pass on knowledge and understanding to future generations. BC Hydro's baseline studies indicate serious incremental effects from the Project on archaeological resources as a result of increased erosional potential in the MCR. Of 39 archaeological sites located along the MCR, 15 "are predicted to experience an increase in site erosion risk due to the Project case" (SNC-Lavalin memorandum re. Change in Archaeology Site Erosion Hazard Class, November 2, 2016). While BC Hydro claims an ability to mitigate this impact following standard guidelines outlined by the British Columbia Archaeology Branch, the standard mitigation guidelines are not designed to address the cultural importance of archaeological sites.

C7.4.2.9 Recommended Mitigations and Actions

Impacts to Ktunaxa values related to archaeological resources will be permanent and likely not mitigable. A summary of recommended mitigations related to Ktunaxa cultural values, including impacts related to archaeology is provided in Section C11.

C7.5 Lands and Resources Sector Residual Project Effects

Ktunaxa knowledge holders are clear that, even after mitigations are imposed, it is extremely likely that residual adverse project effects will remain and will contribute cumulatively with the ongoing serious adverse effects of existing BC Hydro projects in the area. This includes potential effects from the proposed addition of a 6th generating unit to fish and wildlife habitat and biodiversity, sediment and shoreline erosion, and archaeological sites within both the Revelstoke and Arrow reservoirs. The proponent's analysis indicates that Project impacts on the timing, duration and frequency of inundation do not result in measurable increases in risk of erosion, due to the high degree of impacts that currently exist within the system. However, baseline from other disciplines, including archaeology, clearly show an anticipated and measurable adverse Project impact from scour and lateral erosion risk at the site level for 15 of 39 (38%) sites modeled (SNC-Lavalin memorandum re. Change in Archaeology Site Erosion Hazard Class, November 2, 2016). From the Ktunaxa perspective, the highly impacted context, relative to pre-dam conditions, makes *any adverse observable or measureable change* in ecological values significant. Mitigations suggested above do little to change this perspective, but may help decrease the uncertainty associated with both tangible and documented increases in water velocity and erosion risk within the Arrow reservoir, as well as unidentified risks within the Revelstoke reservoir, and potential risks of water level scenarios occurring outside of the normal wet and dry extremes presented in the model.

Ultimately, from the Ktunaxa perspective, more substantial mitigations in the form of changes to dam operation are needed to address current impacts at baseline, and allow for more meaningful restoration of ecosystems and productivity, culturally important plants, wildlife populations and habitats within the Revelstoke and Arrow reservoirs.

Table C7-3 Characterization of Residual Project Effects After Mitigation on Ktunaxa Rights and Interests Related to Lands and Resources

Valued Components	Magnitude	Direction	Geographic Extent	Duration	Frequency	Reversibility	Probability	Context / Confidence
Biodiversity	Low to moderate	Negative	DDZ and adjacent areas of the LSA	permanent	low	Could be reversed with changes in dam management	High	Low confidence due to uncertainty about possible changes in flow regime and reliance on model results
Sediment and Shoreline Erosion	High	Negative	DDZ and adjacent areas of the LSA	permanent	moderate	Could be reversed with changes in dam management	High	Low confidence due to uncertainty about possible changes in flow regime and reliance on model results
Archaeology	High	Negative	DDZ and adjacent areas of the LSA	permanent	moderate	Could be reversed with changes in dam management	High	Low confidence due to uncertainty about possible changes in flow regime and reliance on model results

C7.6 Determination of Significance of Residual Project Effects on Lands and Resources

Based on available information, including Ktunaxa knowledge and experience with similar projects, residual effects on the Ktunaxa valued component of Lands and Resources are anticipated to be likely and:

- measurable or perceivable (i.e., up to .6m increase in MCR level, as well as increased velocity, increased FTC, and increased erosion resulting in impacts to biodiversity, including white sturgeon, salmon, mountain caribou, sediment, and archaeology);
- attributable to the Project, and to the Project in combination with past, present, and foreseeable future impacts from other BC Hydro projects and the environment (e.g., climate change);
- harmful to Ktunaxa stewardship goals including re-establishment of ecological systems on the Columbia River sufficient to maintain the integrity of ʔa·kxaṁis q̓api qapsin (e.g., ocean migrating salmon, white sturgeon, mountain caribou);

Given the anticipated adverse contribution of the Project to existing impacts to Ktunaxa title, rights and interests related to lands and resources, assuming full implementation of mitigations provided in section C.11, and in the absence of actions that may provide reliable and full mitigation of relevant effects, the Project is considered likely to result in significant effects on the Ktunaxa lands and resources including biodiversity, erosion and sedimentation, and archaeology.

Very substantial compensatory or accommodative measures that deliver long-term benefit to the Ktunaxa Nation may, depending on Ktunaxa agreement, be considered to balance out the anticipated adverse residual Project impacts and result in a reversal of historic trends. In order to be effective:

- ecological effects of the Project on land, water and all living things would need to be mitigated to the extent possible, and the mitigations proven culturally and ecologically effective based on Ktunaxa monitoring;
- additional measures would need to result in a substantial net positive effect on ongoing and future practice of Ktunaxa language, title, rights and culture by present and future Ktunaxa citizens on the Arrow Lakes and the Mid Columbia river;
- This balancing of effects would be dependent on negotiation of an IMBA or similar binding document agreeable to Ktunaxa leadership.

C8 KTUNAXA PERSPECTIVES ON CUMULATIVE EFFECTS

Ktunaxa land users do not experience distinct Project-specific effects in isolation from those of other past, or ongoing impacts. Current changes to Ktunaxa lands and waters, including effects from environmental change and industrial projects, are experienced on top of ongoing legacies from past impacts. The full history of colonization, combined with industrial, developmental, and environmental change constrains the current practice of Ktunaxa rights.

From a Ktunaxa perspective, understanding cumulative effects on Ktunaxa title, rights, and interests in relation to the Project requires consideration of a pre-development (c. 1880) baseline, and of the significance of already existing effects on Ktunaxa rights in the Project area, as well as the additional effects of the Project in combination with reasonably foreseeable developments (RFD), and effects from changes in the environment, including climate change.

C8.1 Historical Baseline of Cumulative Effects

While not complete, and largely qualitative, Table 8.1-1 is based on archival, ethnographic, and oral historical sources and provides an initial characterization of a Ktunaxa centred pre-development baseline that includes pre-1880 conditions (a period prior to the establishment of reserves and early industrial development in the region) and subsequent trends and changes up to present day. The baseline is focussed on the Mid Columbia River, Arrow Lakes, and the Revelstoke Reach. It is organized based on themes that include water as an overarching Ktunaxa concern, and it also reflects the five sectors used to organize section C. It is organized into four time periods:

- pre-1881 representing a period prior to the influx of non-indigenous peoples into the valley;
- 1881-1932 representing a period of increasing non-indigenous influence up to the year of Frank Joseph's death;
- 1933-1983 representing a period of intense impacts including extirpation and loss of salmon and damming of the Columbia; and
- 1984-2016 representing the period following construction of the Revelstoke dam.

Table X: Historical Baseline of Cumulative Effects on Ktunaxa Rights and Interests

Water	Traditional Knowledge and Language	Economic	Social	Lands and Resources	Education and Employment
Pre-1881					
Waters and streams in Ktunaxa ʔamakʔis were unconstrained by industrial effects including dams, withdrawals and contaminants. Early mining efforts occurred on the Wild Horse River in the 1860's. The Columbia River was subject to the Big Bend gold rush in the early 1860's, and Ktunaxa leaders blocked entry of American gold seekers at the Pend Oreille confluence. Ktunaxa citizens cared for water as a sacred thing and were able to rely on area streams, wetlands and rivers with confidence for drinking, fishing, plant collection and ceremonial purposes. Rivers and streams also provided important travel corridors.	Prior to 1881, the Ktunaxa language dominated Ktunaxa ʔamakʔis. Ktunaxa or Ɂałnuʔnik̀ living on the Arrow Lakes had a Ktunaxa-speaking core, but were multilingual with marriage to neighbouring allied groups. In the Arrow Lakes area, both Ktunaxa and Salishan languages would have been heard, with the Chinook trade language, English and French becoming more common following the arrival of Euro-Canadian fur traders and settlers beginning in the early 1800s. Christianity became an important part of Ktunaxa cultural practice after the arrival of Father de Smet in the mid-1840s. Ktunaxa trails and water ways provide primary transport routes and corridors of communication between Ktunaxa and other nations.	Ktunaxa maintain commercial trading ties with other indigenous nations, as well as fur traders (HBC and independent) in the region. Discovery of gold near the Big Bend in 1862, and at Wild Horse Creek in 1863, leads to early mining and influx of non-aboriginal peoples. The Arrow Lakes and Revelstoke areas were intersected by trade routes. Horses came to the Ktunaxa in the late 1700's, were highly valued and a sign of wealth. Seasonal villages around the Arrow Lakes provide a basis for a vibrant trade economy in fur and other resources, and for the annual subsistence round.	While estimates vary, the population of Ktunaxa communities likely declined by as much as 80% or 90% between 1780 and 1880 due largely to introduced diseases. On the Arrow Lakes, a military alliance between Ktunaxa families living at Arrow Lakes, other Ktunaxa communities, and neighbouring nations to the north and west brought decades of hostilities to an end with removal of Colville groups to the south by the early 1840's. Ktunaxa from Kootenay Lake and further east regularly visited Ktunaxa Lakes people at Burton, near Revelstoke, and elsewhere on the Arrow Lakes.	Ktunaxa governance and authority in the area maintained under Lower Kootenay chiefs, including Chief Blind, Caterpillar and Star Blanket, and later by Kootenay Joe, father of Louis and Frank Joseph. Villages, fishing and harvesting areas, cultural-spiritual areas, and trails are located in and near the Columbia and Illecillewaet River valleys and elsewhere in Arrow Lakes including Beaton Arm. While an international boundary between lands claimed by the US and Britain was established in 1846, no effective assertion of Canadian sovereignty, beyond survey of land, existed on Ktunaxa lands until the late 1880s. Ktunaxa kept valley bottoms and horse pasture open through annual burning, and relied on seasonal harvest of wild foods, including fish, ungulates, and plant foods. Minimal constraints existed for ecological systems. Kootenai chief describes to Ross (1825)[i] why Ktunaxa lived on Arrow Lakes: well stocked with beaver and other fur-bearing species; lakes filled with sturgeon and other fish; abundant wild game (deer, caribou).	Prior to 1881, Ktunaxa citizens in the Mid Columbia continued to practice an ancestral way of life and economy, including an annual harvesting round, largely free of forced interference. Transmission of knowledge between generations continued based on the Ktunaxa oral tradition and teaching of Ktunaxa knowledge. Prior to 1880, employment for wages was rare, but not unknown as Ktunaxa frequently provided services to the HBC as guides.

Water	Traditional Knowledge and Language	Economic	Social	Lands and Resources	Education and Employment
1881 - 1932					
Impacts from early logging and mining begin to impact the Columbia River. Salmon harvest in the upper Columbia, an important part of the Ktunaxa seasonal round, continues but is reduced due to overharvest in the lower Columbia and mining related habitat impacts. Ktunaxa citizens continue to care for water as a sacred thing and rely on the Arrow Lakes, and Columbia River and its tributaries, for drinking, fishing, plant collection and ceremonial purposes. The Arrow Lakes remain an important transport route by steamship, train and canoe.	Ktunaxa is still the dominant language in Ktunaxa communities, but English becomes the dominant language outside them. Pre-emption and Crown land grants privatize Ktunaxa lands. Under pressure from government agents, Ktunaxa citizens resident on the Arrow Lakes move onto reserves, and the Oatscott reserve is surveyed downstream from Burton City in 1902. Frank Joseph and Louie Joseph maintain Ktunaxa stewardship in the Arrow Lakes. In 1932, Frank Joseph, as chief of the Arrow Lakes Kootenay, takes part in a gathering of Ktunaxa chiefs at Creston.	The discovery of gold at Cariboo Creek in the Arrow Lakes area in the 1890s draws an influx of farmers and miners; Burton City is established. Forestry develops along side mining, and steam powered ships and rail establish Revelstoke and Arrowhead to the south as transportation centers. The non-Ktunaxa population grows rapidly around Nakusp and Arrowhead. Ktunaxa are involved in mining in the west Kootenays, but Ktunaxa citizens find themselves increasingly excluded from the new wage economy. Mining, forestry, agriculture, and trade increases the wealth of non- Ktunaxa residents and economic disparities increase between Ktunaxa and non-Ktunaxa. Fur trapping and selling berries remains important for the Ktunaxa economy and way of life, in addition to subsistence economy activities.	Illness, including tuberculosis and flu, remains at high levels. All three of Louie Joseph's teenage sons die of tuberculosis in the 1920s. Ktunaxa population continues to drop and reaches its low point in the early 1900s. Issues of racism and wealth disparity intensify as the non-Ktunaxa population increases and systemic inequalities compound. Ktunaxa citizens find themselves largely shut out of the dominant economy. Social problems, including poverty and alcohol, become increasing problems for Ktunaxa families.	Ktunaxa reserves are established by the Canadian government with objections from Ktunaxa leaders. Conflicts between Ktunaxa citizens and non-Aboriginal new comers seeking land and resources become more intense. Implementation of reserves and Indian Act restrictions impinge on traditional Ktunaxa governance, and increased pressure from non-Ktunaxa, leading to armed conflict at Joseph's Prairie, the location of modern Cranbrook. Ktunaxa oral histories record some of the first promises made by a Crown authority to Ktunaxa leadership. Ecological effects of early mining practices, forest harvesting (including clearing related to rail development and fuel for steam operation), fencing of pre-empted or privatized lands, and declining air and water quality begin to be felt. Increased pressure on fisheries, including sturgeon fishing, and wildlife including caribou. Railway and road networks increase accessibility and pressure on the Columbia River. Ktunaxa opposition to Canadian and BC interference is maintained. Frank and Louie Joseph / Kootenay live on the Arrow Lakes with their families.	Christianity becomes a stronger influence in Ktunaxa communities, reinforced by the development of government supported residential schools, and Indian Act legislation restricting the sundance and other important Ktunaxa ceremonial practices. At the household level, Ktunaxa families maintain transmission of knowledge to young people. Some Ktunaxa young people attend school, learning to read and write.

Water	Traditional Knowledge and Language	Economic	Social	Lands and Resources	Education and Employment
1933 - 1983					
- 1932 Cora Linn Dam constructed on the Kootenay River downstream of Nelson, operates as a run of river generator until 1938 - 1942 Grand Coulee Dam in the United States is commissioned after ten years of construction. - 1964 Columbia River Treaty is established. - 1967 Duncan Dam completed. - 1968 Keenleyside Dam (originally known as High Arrow Dam), is completed upstream of Castlegar, raising Arrow Lakes' levels by 12 metres and flooding Ktunaxa settlements and preferred harvesting and use areas. - 1973 Mica Dam completed.	Ktunaxa language is spoken less frequently in everyday settings and is actively discouraged in the residential schools. After the 1960's, English becomes the dominant language in Ktunaxa communities, though Ktunaxa is still spoken fluently in many homes. Ktunaxa families continue to live around the Arrow Lakes and hold ceremonies into the 1940s, likely timed with annual salmon spawning.	Construction of hydro-dams requires large financial investment and inundates large areas. Water resources are monopolized without consideration of Ktunaxa title or rights. Forestry industry established in the area of Revelstoke, Beaton Arm and Comaplix area. Economic disparities between Ktunaxa and non-Ktunaxa increase.	Overall health of Ktunaxa citizens improves as a result of increased access to health services, but social challenges increase under pressure from ongoing Indian Act policies. Changes to the Indian Act make it impossible to push land issues in the courts and to practice some aspects of Ktunaxa culture until the late 1950s.	Salmon are extirpated from the upper Columbia around 1940 by construction of the Grand Coulee Dam in the United States. This removes the ability of Ktunaxa peoples to harvest salmon, Sturgeon, caribou, yellowfin rainbow trout and other populations decline as impacts accumulate. By the late 1960s, in response to increasing challenges to Ktunaxa governance, Ktunaxa rights-based organization results in vocal calls for recognition of Ktunaxa rights on both sides of the international border. Due to industrial impacts, and pressure from government officials, Ktunaxa use on the Columbia River is diminished, but continues as a pattern of temporary hunting camps, and resource harvesting areas used while in the area. Long distance trails and passes are used less frequently by Ktunaxa following development of railway and road Oatscott reserve is decommissioned in 1952 without acknowledgement of ongoing Ktunaxa practice in the area, or descendants living in Ktunaxa communities.	Some Ktunaxa participate in the forestry and mining industry as drivers and other labour. School education becomes more common in Ktunaxa communities. During school breaks, Ktunaxa elders take children out on the land. Just prior to 1968, Marion Goodman / Earnest travels with her grandson to where she lived at Burton and they travel Arrow Lake by canoe. She teaches him Ktunaxa stories and history as they travel.

Water	Traditional Knowledge and Language	Economic	Social	Lands and Resources	Education and Employment
1984 - 2016					
In 1984, Revelstoke Dam construction is completed, impounding the Columbia River above Revelstoke, creating Revelstoke Reservoir. Industrial logging intensifies and continues to impact the Columbia watershed.	Ktunaxa language is spoken less frequently in everyday settings. English becomes the dominant language in many Ktunaxa homes as impacts from residential schools, especially after the 1960's. By the 1990's, many homes do not have fluent Ktunaxa speakers and the language becomes increasingly rare. The Ktunaxa Nation actively works to revitalize Ktunaxa knowledge and language.	Economic disparities between Ktunaxa and non-Ktunaxa continue to increase. Ktunaxa participation in BC Hydro operations is minimal or non-existent until agreements associated with Mica 5/6 and the CVT Project result in modest improvements.	Overall health of Ktunaxa citizens improves as a result of increased access to health services, but social challenges increase. Ktunaxa-Kinbasket takes over health and child and family services from the Province.	Despite the continued alienation of Ktunaxa rights in the Arrow Lakes due to increased industrial development, land privatization, settlement and government policy, Ktunaxa citizens maintain land use and stewardship in the Arrow Lakes and Mid Columbia River valley.	Ktunaxa employment and education rates increase, but disparities in access continue. The Ktunaxa Nation works to improve opportunities. As of October 2015, no Ktunaxa were employed in BC Hydro's Revelstoke Dam operations (including Revelstoke 5).

C8.1.1 Assessment of Project Cumulative Effects

Ktunaxa review of section B assessment and it's implication for cumulative effects is ongoing. The Ktunaxa understanding of cumulative effects and the contribution residual Project effects will be updated based on ongoing work. If the Project proceeds, changes caused by the Project will be experienced within a wide range of existing ecological and industrial impacts in the Mid Columbia River Valley. Within Mi¢'qaqas ʔamakis

(Chickadee's Land), riverine floodplains, wetlands, and valley bottoms, traditionally maintained through Ktunaxa stewardship, are now largely permanently or seasonally inundated and subject to man-made flow regimes responding to electrical demand from far away urban areas. Fire suppression, forest harvesting, housing, energy transmission, hydro-electric reservoirs, agriculture, privatization of lands, and transportation developments all contribute additional effects. Remaining riverine and riparian remnants provide critical habitat for cultural keystone species including white sturgeon, kokanee, other fish, furbearers, ungulates, and a range of other plants and animals of importance to Ktunaxa. Anadromous salmon, another keystone of the Columbia ecosystem, have been blocked from the MCR for more than three generations. The Mid Columbia River valley has also seen substantial residential and recreational development and associated municipal water use and waste effluent impacts.

Based on the local study area (LSA) and regional study area (RSA), cumulative effects including loss of salmon and yellowfin (large-bodied) rainbow trout, impacts to white sturgeon, mountain caribou, and other biodiversity components, impacts to ecosystem (riparian, floodplain, wetland, upland) structure, productivity and function are anticipated to be exacerbated by the Project. Impoundment of the Columbia River has already seriously impacted the ability of current Ktunaxa citizens to practice title and rights along the MCR. In terms of percentage, more than 80% of some valley bottom ecosystem types, such as ecologically important wetlands and riparian areas, have already been lost. Existing impacts and current total disturbance levels already far exceed thresholds of significant effect. The Project would contribute additional adverse residual effects that would reduce and destabilize remnant riparian habitats, erode remaining cultural resources, and exacerbate existing impacts on Ktunaxa title and rights in Mi¢'qaqas ʔamakis. Past disturbance has inundated areas of particular Ktunaxa cultural value, including trails, habitation areas, and harvesting areas in the Project LSA and RSA, including culturally and spiritually important resources. The Project will further erode Ktunaxa cultural resources and opportunities for transmission of knowledge between generations.

Should the Project proceed, Ktunaxa knowledge holders anticipate incremental Project impacts to the quality and quantity of wild foods available for Ktunaxa harvest in preferred locations, including fish habitat important to salmon and sturgeon downstream along the MCR. Project effects on water levels, flows, velocities, erosion, and fish and fish habitat will interact with other foreseeable developments, climate change, ongoing and future BC Hydro flow management regimes, and are expected to incrementally increase the magnitude and extent of already existing significant adverse effects on Ktunaxa title, rights and interests.

From a Ktunaxa perspective, considering the overall disturbance of lands and waters within the Mid Columbia River Valley, and considering both quantitative disturbance, and more qualitative factors, a threshold of adverse, long term, high magnitude effect on the exercise of Ktunaxa title and rights in the RSA, as defined in C1, is understood to have already been surpassed. Additional residual Project effects, and effects from other reasonably foreseeable developments, changes in the environment, are anticipated to interact into the future. Potential synergistic, additive, and/or antagonistic interactions among a range of aquatic, riparian and upland impacts are likely, but poorly understood. Information from previous and ongoing revegetation programs indicates that areas subject to BC Hydro operating regimes and other disturbances are challenging to

revegetate, and that the structure, function and integrity of pre-disturbance ecological communities, may be impossible to restore to culturally and ecologically effective levels within the context of industrial water management.

Based on existing information, and uncertainties related to mitigation and the influence of other BC Hydro facilities, the KNC anticipates that that these cumulative effects will exacerbate already significant effects in the Mid Columbia River Valley, and on the title, rights and interests of Ktunaxa citizens, for the foreseeable future.

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C9 OTHER KTUNAXA NATION INTERESTS

This section identifies other Ktunaxa interests with respect to potential social, economic, environmental, heritage and health effects (to the extent not already identified in Sections C2-C7).

Aboriginal interests are generally defined as claimed, but unproven rights. The Ktunaxa Nation maintains that its rights – including cultural, economic, governance, and land and water rights, are proven and stand based in Ktunaxa law and oral tradition. With regard to Ktunaxa ʔamakʔis, it is the governments of BC and Canada that claim rights that are not proven under either Ktunaxa or Canadian law.

See Section C2 through C7 (Ktunaxa Rights) for additional information.

C10 KTUNAXA NATION COUNCIL PERSPECTIVES ON PRE-APPLICATION CONSULTATION

The BC Hydro draft report for the Revelstoke Unit 6 Project*, Draft Aboriginal Consultation Report 2* (January 27th, 2017) includes a summary of BC Hydro's understanding of the Ktunaxa Nation Council's (KNC) concerns related to the Project. Subsection C10 below includes a summary of the KNC perspective on consultation for the Revelstoke Unit 6 Environmental Assessment (Rev 6 EA) Project. Please see the draft BC Hydro report for a detailed table of comments provided by the KNC staff and consultants to date.

During the pre-application period, the KNC provided BC Hydro with substantial input and information, through meetings and in writing. This information includes concerns regarding potential Project effects on Ktunaxa title, rights and interest, and the adequacy of information and assessment related to the Project. In addition to providing comments on the draft Application Information Requirements, and undertaking writing of Section C materials related to Ktunaxa rights and interests, the KNC has participated in a series of meetings and workshops related to BC Hydro's Core Committee process. As part of this process, KNC staff and contractors reviewed draft baseline and assessment material related Section B of the application. As noted in a letter and memorandum provided to the BC EAO on December 2, 2016, despite ample information and communication through the pre-application period, there are still many outstanding issues:

Key outstanding issues include:

- Valued Component selection and scale of assessment -VCs do not fully characterize the scope of potential impacts with regard to certain plants and species and in many cases the spatial scale for assessment is not appropriate for understanding impacts to Ktunaxa rights and interests;
- Water as a full valued-component with attendant assessment of Project effects on flow levels, timing, ice formation, and freeze-thaw cycling resulting in changes in erosion and deposition, as well as related valued components (e.g. wildlife, archaeology, fish and fish habitat, and others);
- Adverse Project effects on existing valued components where impacts are either under-estimated, or not fully mitigable, and on a suite of other under-recognized values, including multiple rare and culturally important species; as such KNC representatives lack confidence in BC Hydro's assessment methodology and the assessment conclusions of non-measurable adverse effects; and
- Cumulative effects assessment that anticipates Project effects in combination with effects from other past, ongoing, or anticipated future projects as well as changes in the environment, including the reintroduction of anadromous salmon to the mid and upper Columbia River. This is particularly relevant where ecological or cultural thresholds have already been exceeded and perceived incremental project effects are adverse.

KNC is committed to full consideration of materials submitted by BC Hydro, and to participation in decision-making regarding the Project, including possible identification of mitigations and accommodations, consistent with Ktunaxa title, rights and stewardship responsibilities.

C11 KTUNAXA DRAFT SUMMARY OF RECOMMENDED PROJECT MITIGATIONS AND MEASURES

Mitigation measures are currently under review by authors.

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Okanagan Nation Rights and Interests

Submission to Part C of BC Hydro's Revelstoke Unit 6 Project Environmental Assessment Application

FEBRUARY 14, 2017

Okanagan Nation Rights and Interests: Submission to Part C of BC Hydro's Revelstoke 6 Environmental Assessment Application

FEBRUARY 14, 2017.

Prepared by the Okanagan Indian Band with support from Westbank First Nation, Penticton Indian Band, the Okanagan Nation Alliance and The Firelight Group.

Submitted to: BC Hydro

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Disclaimer: The participation of the Okanagan Indian Band (OKIB) in this project is without prejudice to the Indigenous rights of the Okanagan Nation or the Indigenous rights of any other of its member Bands—Westbank First Nation (WFN) and Penticton Indian Band (PIB)—or any members thereof. The information contained in this report is based on research by the OKIB, WFN, PIB and the Okanagan Nation Alliance (ONA), as well as published works and archival research, all of which was limited by available time and resources. It reflects the understanding of the authors, and is not intended to be a complete depiction of the dynamic and living systems of resource use, traditional economy, and local knowledge regarding community conditions maintained by Okanagan Nation members.

The Syilx (Okanagan) words that appear in this document are spelled phonetically as the Okanagan practiced an Oral tradition and did not have an alphabet.

Nothing in this report derogates or takes away value from Captikʷɬ. The Crown approach to consultation results in an extremely simplified and limited interpretation of the vast and complex Captikʷɬ that is passed down through practice and oral tradition.

The information contained herein does not, and should not be used to define, limit, or otherwise constrain the Indigenous title, rights, or interests of Okanagan Nation, any of the Okanagan Bands, or other First Nations or Indigenous peoples. This report does not represent the opinions of the Okanagan Nation or any of the Okanagan Bands on whether or not the proposed Revelstoke Unit 6 Project should proceed.

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List of Acronyms

AIA	Archaeological Impact Assessment
AIUS	Aboriginal Interests and Use Study
BC	British Columbia
BCH	BC Hydro
BCTF	BC Teacher's Federation
CEC	Chiefs Executive Council
cfs	Cubic feet per second
CPR	Canadian Pacific Railway
EA	Environmental Assessment
EAC	Environmental Assessment Certificate
EAO	Environmental Assessment Office
Firelight	The Firelight Group
FLNRO	Ministry of Forests, Lands and Natural Resources
FTE	Full time equivalent
GIS	Geographic Information System
GWh	Gigawatt hours
Ha	Hectares
HBC	Hudson's Bay Company
ILM	Interior to Lower Mainland Transmission Line
INAC	Indigenous and Northern Affairs Canada
IR	Indian Reserve
km	Kilometer
km^2	Square kilometers
LSA	Local Study Area
LSIB	Lower Similkameen Indian Band
m	Meter
m^3/yr	Cubic meters per year

MCR	Middle Columbia River
MW	Megawatt
n.d.	No date
Ntd	Note to draft
NWC	North West Company
OKIB	Okanagan Indian Band
ON	Okanagan Nation
ONA	Okanagan Nation Alliance
PIB	Penticton Indian Band
RDOS	Regional District of Similkameen
Rev5	BC Hydro's Revelstoke 5 Project
Rev6	BC Hydro's Revelstoke 6 Project
RSA	Regional Study Area
SARA	Species at Risk Act
SCS	Summerland Capacitor Station
SEIA	Socio-economic Impact Assessment
TSA	Timber Supply Area
US	United States
VC	Valued component
WFN	Westbank First Nation

Translations of Syilx Terms used in this Report

Syilx Term	English Translation
sktəɬəɬtan	Balancing out everything by straightening it out
Captikʷɬ	Traditional stories, passed on by oral tradition, holding knowledge and laws of what it means to be Syilx
c'ayxa	Crayfish/ Crawfish
c'm7tus	Sturgeon
qaʔɬ ilmìxʷəm	Hereditary leadership system, men and women
ƛəɬʕaċxən	Process Syilx people follow in order to come to decisions about resources. One meaning is to "look underneath" the obvious. Term is also used to refer to the process of tracking an animal and suggests the need to look beyond the immediate to see underneath our own tracks to see where the footprints will lead.
knkanaxʷaʔ	Hereditary salmon chief in the late 19th century
qʷspiċaʔ	Arrowhead buffalo hide place
k'ʷl'əncutn	Creator of all things
naʔƛʷl'məntət	Traditional/current way of life and doing things through practical daily use
nk'ʕaməntət	Prayers for strength and help
iʔnunxʷinaʔntət	Belief system and spirituality
nƛmapəlqs	Okanagan Indian Band, also the place name for Head of the Lake, Vernon area
nƛmip	Osoyoos Indian Band or head of Osoyoos lake
nƛmapəlqs	Fishing village on the upper most end of Upper Arrow Lake at Comaplix
Nsyilxən	Okanagan language
ntitx	Spring (Chinook) salmon, one of the four food chiefs

Syilx Term	English Translation
sp̓itɁ'm	Bitterroot (Lewisia rediviva), one of the four food chiefs
skc̓x̌ʷiplaʔ	The laws/responsibilities which outline our Rights, laws that govern every aspect of our lives. They are derived from captikʷɬ, which is passed from the creator through an oral culture
nʕayckst	Arrow Lakes
siwɬkʷ	Water
sənk̓llp	Coyote, a main character in most of the captikʷɬ stories as an example both good and bad
snqax̌ʔstn	Where buffalo hides were staked and stretched on the ground (Revelstoke)
sənpintkən	Penticton Indian Band, also the place name for the area
suknaʔkinx	"transport toward the head or top end"; this refers to the people traveling from the head of the Okanagan Lake to where the Okanagan River meet the Columbia River
stɬʔtaɬt	A word used in translation for Title and Rights of the people, but also refers to responsibility towards humanity or all ecology; Rights and responsibility of the people
suxʷxtəm	People who take care of land, water and four ecosystems
siwɬkw	Water
syilx	Okanagan people
tmixw	Four sacred life forces/ecosystems
tmxwulaxw	The land, or our people
xatmasqilxʷ	"In front of us", the second stage of learning to live on the land; also translated as the "First people". (NB: This relates to an actual time period in the temporal worldview of the Syilx and should not be confused with "First Nations" or "Indigenous peoples" in the current parlance.)

This report does not:

a. *limit, alter, fulfill or partially fulfill the Crown's duty to consult and accommodate any Okanagan community, or the Okanagan Nation or Syilx People in relation to any decision to issue any permit, licence or other authorization in relation to BC Hydro's activities or operations in Okanagan Territory;*

b. *provide any Okanagan community, or the Okanagan Nation or Syilx People's consent to any BCH activity or operation nor any Crown decision to issue any permit, licence or other authorization in relation to BC Hydro's activities or operations in Okanagan Territory;*

c. *provide justification of any Crown infringement of any Okanagan community, or the Okanagan Nation or Syilx People's aboriginal title or rights; or*

d. *limit, alter, fulfill, or partially fulfill any need or requirement for BC Hydro to engage and reach understandings with any Okanagan community, or the Okanagan Nation or Syilx People regarding its operations in Okanagan Territory.*

Preamble

The history, teachings and stories of the Syilx people are passed from generation to generation through oratories. Oral history is our canon of proof, a critical part of sharing our history between generations and planning for the future. Our ways are, and will always be, our strength and we will continue to be strong nations.

The Captikʷɬ story below is a mix of legends, oral teaching, and insightful thoughts from the perspective of the storyteller, who is also a fluent speaker of the Nsyilxəɬn (Okanagan) language (see Appendix 1 for more details and background on the Captikʷɬ). Caqcaqalxqn (Arnold Baptiste) is an individual brought up by and raised around Okanagan cultural leaders and language speakers, spiritually insightful elders and politicians, all of whom helped to give him, as the story teller, the courage needed to bring each and every one of these words first to voice and then to paper.

The Captikʷɬ raises many of the themes and concerns that are at the essence of Okanagan's worldview and past and current socio-cultural context, which will emerge throughout this submission. They include:

- The need for balance in a healthy world;
- The critical importance – the sacredness – of salmon and water to Syilx;
- Syilx governance rights and responsibilities over our territory;
- Syilx connection to the Project-affected area, including Upper Arrow Lake and the Columbia River;
- The importance of knowledge of – and travels across – the Syilx cultural landscape to cultural continuity and well-being of our people and critical role of land to identity;
- How the "Visitors" (fur traders, then settlers and the Crown) have changed everything;
- The key role of the creation of dams in eroding the cultural landscape; and
- A remaining strong hope for the future that Syilx rights and responsibilities, and a more natural balance between people and the natural environment, can be renewed.

Captikʷɬ: The River People, Coyote and Salmon, as told by Caqcaqalxqn[1]

In the time immemorial before the arrival of the new comers to the land of the Syilx people the land was wild clean pure and natural, each and every animate and inanimate being was a part of the whole there were no fragments. Everything had been delicately and deliberately placed within a precise inter-relation matrix. All of the living things that existed in "The Syilx World" balanced itself off of everything else around it. In order for the world to maintain this balance there was no domination of any one thing over other things. The balance was said to be related to the world and therefore taught that it is spherical and made up of four great parts. Each of the four parts are placed in a position that counter-balanced all of the other parts.

*The Ntytyix [**ntitx**], "Chinook Salmon" was purposefully placed at one of the great cornerstone positions as the chief of that realm. Ntytiyix [**ntitx**], was known as a chief, he helped to govern and keep the Syilx people in balance, through stories and laws governing the land. Inter-nation Governance and Land Laws practiced by each human being was synchronized to this realm; known as the water kingdom. The old testaments and teaching about the salmon and the water helped the Syilx people understand their place on the land and how to live their lives guided by the laws of the great Rivers.*

*Chief Ntytyix [**ntitx**] and the land laws do pertain to the area known as the Arrow lakes. The laws to mention a few are about Land and Water Stewardship, Nation to Nation Relationships and Protocols. All people were undeviating from these fundamental laws and honored the balance brought to them by this chief. All human beings knew that the sacredness of water is to be respected. Captikʷɬ legends, or Coyote Stories, were told since the beginning of time. These great legends and stories were not just about laws and the salmon they also included land forms, which helped to bring the physical evidence needed for unwavering acceptance; that the land, water and animals governed all people. Coyote created many land forms all across our lands.*

In the area of the Arrow Lakes there were sacred land forms created by Coyote to ensure that the Syilx people would forever remember. Visual and oratory evidence of these land forms were identified through the – captikʷɬ – stories told by the people. Wherever their travels took them across the land the people brought attention to these land forms. The journeys and stories told for hundreds of thousands of years to thousands of generations of people were always about identity. These are just a few things mentioned that helped and kept the land laws and histories alive and well. Each story put forth by eloquent

[1] Arnold Baptiste, on an Okanagan Nation site visit to the Rev6 location, August 17-19, 2015. See Appendix 1 for further details.

renowned orators storytellers, chiefs and leaders maintained the identity of the Syilx people and their ties to the land and water. All of which guaranteed that living along the great shores of the Arrow Lakes was a harmonious existence for all.

Then the "Visitors" came to Syilx lands: and the dams happened. Each flood pool behind each dam devastated the land and buried the landforms and the laws beneath sediment and soil. The flooding water drown the Syilx foot prints and homes. Their voices got eroded and erased too, by whirl pools of water, back eddies and the raging river as it is caused to artificially rise and fall from the dams operations. At the same time, in its wake, are the exposed ancient remains of Syilx and siʔxʷepmx people. Also as a result, we no longer are able to see, at the great Kettle Falls, where coyote had sat with his three pronged harpoon, and as the story goes, with one great thrust he bought the salmon ceremony and the protocols to shore there.

From that first salmon and the return cycle upon the fourth year known as "The Big Run" and since time immemorial the people continue to do the salmon ceremony at these fish harvesting sites; Kettle Falls, Castlegar, Revelstoke, Okanagan Falls, and always remembering to state the laws, teach the teaching and tell the old stories to the young as they did for generations and all the while remembering to share a ceremonial salmon. Which is according to our legends the great one prophesized to move with grace and ease through the powerful raging waters of the Kettle River, North and South Thompson Rivers, The Fraser River and The Columbia River.

1. Introduction

1.1 Overview and Scope of Report

This submission to support Part C of BC Hydro's Environmental Assessment Application for the Revelstoke Generating Unit 6 Project (Rev6) has been prepared by Okanagan Indian Band (OKIB) on behalf of the Okanagan Nation (ON) with support from the Okanagan Nation Alliance (ONA), Westbank First Nation (WFN), Penticton Indian Band (PIB) and the Firelight Group (Firelight). This submission was developed in response to BC Hydro's intent to develop both the Rev6 generating unit and capacitor station wholly within the traditional territory of the Okanagan Nation[2].

The Syilx Peoples, descendants of the Nsyilxən speaking Peoples, live, use and occupy the lands, waters and resources and exercise jurisdiction and ownership in the Syilx Territory. They are the historic community of Peoples sharing language, customs, traditions, historical experience, territory and resources at the time of first contact and at sovereignty assertion by the Crown. The Syilx Peoples hold Aboriginal Title and Rights ("Syilx Title and Rights") throughout Syilx Territory, and have never ceded, surrendered or released any Syilx Title and Rights (refer to Section 2 for a map of the Syilx territory). Syilx Title includes ownership of lands and the resources within Syilx Territory and the right to use and enjoy the land, the right to decide how the land will be used, the right to proactively manage the land, and the right to the economic benefits of the land. Syilx Title is collectively held for this and all future generations of Syilx Peoples. The use of the lands and resources by third parties may proceed only with the free, prior, and informed consent of the Syilx Peoples.

The Okanagan Nation Alliance (ONA) is the Tribal Council for the eight member communities of the Syilx Nation which includes Osoyoos, Upper Nicola, Lower Similkameen, Upper Similkameen, Penticton, Okanagan Indian Band, Westbank, and the Confederated Tribes of the Colville Reservation in the United States. Consistent with Okanagan Nation Alliance (ONA) internal protocols and practices, each of the ONA member bands is understood to be responsible for land and resources in their respective area of responsibility. These responsibilities are all carried out in a manner which respects Syilx Nation title and rights. Within Syilx territory, the Project falls within the OKIB, WFN, and PIB areas of responsibility and as such, OKIB has been authorized to take the

[2] In some instances, the shorter terms "Okanagan" or "Syilx" are used in this report. These terms are always used synonymously with Okanagan Nation – the people and groups themselves – and the term "Okanagan" in particular should not be read as the modern geographic delimiter used by settler populations (for example, it does not refer to the "Thompson-Okanagan" region as defined by the Province.

lead in looking at the Project closely and deeply, having regard not only to the OKIB community, but also with regard to Syilx Nation title and rights.

The OKIB, WFN, PIB and ONA have directly participated in developing this Part C submission, in order to reflect shared Okanagan Nation rights and interests in the project areas, as well as identify potential impacts of the Project and other past and present cumulative effects causing agents on Okanagan rights, interests and way of life.[3]

The Okanagan Nation expects that BCH will seek consent before proceeding with the Project, particularly in light of the serious impacts its projects have already had in the Territory, all of which was done without the Nation's consent.

Okanagan Nation and its members appreciate BC Hydro's willingness to fund this Part C Assessment at the community level. We look forward to engaging with BC Hydro on the results.

1.2 Limitations of the Study

This draft Part C Report is subject to a variety of limitations, many of which need to be overcome prior to Okanagan Nation signing off on the use of a version of this document as the actual Part C submission in the EAO process. It is important to remember that Part C effects estimations, in particular, MUST be and always in the past in BC environmental assessment, have been informed by the completed findings of Part B assessments, including full baseline, effects characterization, and mitigation information. This is not the case in this preliminary report as there are substantial gaps in the information provided to date by BC Hydro to the Okanagan Nation. Okanagan Nation takes on this assessment of effects on Rights, Title and Interests with the utmost seriousness, and will only make estimations of residual effects – effects after mitigation is applied, once it has the best possible information on:

1. *the Project and its effects potential;*
2. *the current state of the receiving environment, including change over time, across an adequate breadth of indicators; and*
3. *All mitigation, monitoring and compensatory measures the Proponent is committed to implementing, in order to assess residual effects after mitigation is applied.*

At the present time, there are gaps in all three areas that must be filled through consultation between BC Hydro and Okanagan Nation. Okanagan Nation will work diligently with BC Hydro to identify these gaps, but they primarily must be filled by BC Hydro, the Project Proponent.

[3] See "Limitations" section for discussion of why "reasonably foreseeable future developments" are not included in the scope of this assessment.

Okanagan Nation has provided under separate cover a list of information gaps that need filling prior to completion of effects assessment, and looks forward to discussing recommended mitigation, monitoring or compensatory measures for consideration in subsequent mitigation meetings between ON and BC Hydro.

The following Okanagan-led studies were conducted in support of or in parallel to this Part C submission:

- The OKIB socioeconomic baseline study for the Rev6 environmental assessment (EA);
- Limited Okanagan Nation fieldwork in the Revelstoke Dam area in July 2015 (see Appendix 1); and
- A PIB preliminary assessment of potential effects of the Summerland Capacitor Station.

However, OKIB, WFN, PIB or ONA have not had the opportunity to undertake fulsome use and occupancy mapping studies in the Project study area. As such, the research and writing required to complete this Part C report is primarily desktop-based, with inputs from various departments at OKIB, ONA, PIB and WFN offices.

In addition, WFN and PIB intend to move ahead in developing socioeconomic baselines for the purposes of this EA for their respective communities, but have not had the capacity to engage in this work to date. These studies will be completed in coming months and may be required to inform the final Part C effects estimations.

The temporal scope for this study focuses on past, present and anticipated future practice of Okanagan rights and interests but the effect causing agents are limited to past, present and Rev6 caused effects only. Reasonably foreseeable future developments will also likely add to cumulative effects on Okanagan Nation rights and interests. These developments, which would typically include any projects proposed at the time of the assessment, are not subject to this Part C submission at this time, because:

- They are beyond the capacity of ON to identify on our own or assess the effects of without further capacity funding; and
- They have not clearly been defined in an approved AIR for the proposed Project, nor has BC Hydro provided ON with a list of “reasonably foreseeable future developments” it will be considering in its cumulative effects assessment, as required in the EA.

1.3 Holistic Effects Assessment and the Critical Need to Establish Cumulative Effects Loading in the pre-Project Case

As seen throughout the report, Okanagan cultural values, and the natural laws and norms used in its governance system embrace a multi-faceted, holistic sense of the world and the People's role in it. This holistic perspective differs radically from the typical perspective taken in environmental assessment in critical ways. First of all, in the Okanagan worldview VCs are recognized as being intricately interconnected, and therefore links between them (and between the many different effects pathways that impact on each VC) merit close consideration. This differs from the typical EA "silo" approach to effects assessment, which artificially separates both VCs and impact pathways. The Okanagan approach recognizes that all impacts on a VC must be considered – and focuses on total effects loading on the VC.

In recent years, environmental assessment practitioners have started to increasingly recognize what indigenous peoples have always held – that by far the most important impacts are cumulative impacts. Assessing impacts from discrete projects as if they were the primary source of concern is an increasingly illusory task and one that takes the focus off what should be the primary focus: total effects loading on the VC. As Duinker and Greig (2006) put it "the critically important point is quite simply the need to assess the aggregate stresses acting on environmental values." The focus of analysis in environmental assessment should be on the health of the Valued Components (VCs) in question, using *total effects* on the VCs of concern as the most important factor for decision-making, and not simply the project's incremental contribution to cumulative effects (e.g, Duinker and Greig 2006, 154; Noble, 2013, 2). The approach taken in this study, echoes this trend.

Cumulative effects assessment must in a holistic assessment lens include identification of all cumulative effects causing agents, rather than ignoring many causes of past change. In relation to these past changes, Noble (2014) suggests:

> *Impacts on [a First Nation's] interests, specifically impacts on the VC current use of land and resources for traditional purposes, need to be approached as legacy effects – a persistent effect on contemporary function from definite and identifiable past perturbations... Legacy effects are effects caused by past action that persist, or even amplify, over time and often act cumulatively with the effects of current, and future, development action.*

Noble (2014) also notes a common focus on prioritizing analysis of ecological systemic change in EA, while not adequately considering the significance of the effects of past disturbances on First Nations' interests due to long-term resource development in their traditional territories, without which cumulative effects on the First Nation's interests cannot be adequately determined.

Consideration must be given to all types of activities and stresses (human-induced and natural disturbances) that may interact with the project's effects, not merely projects that are subject to EAs themselves. Multiple causal factors and pathways may need to be recognized. These may not be limited to industrial developments. Factors may include mixed natural/anthropogenic change, land privatization and other government policies, as well as industrial clearing and other impacts on the land base. Changes enforced on Aboriginal peoples since contact with non-Aboriginal people are considered in section 2.5 of this report, and a cumulative effects context is provided in each VC-specific section (4 through 8).

The Okanagan approach recognizes that the most important types of impacts to assess are cumulative effects, even in Project-specific environmental assessment. This study recognizes both that total cumulative effects loading on VCs and overall values is the most important factor for decision-making, and that this total cumulative effects loading context must be established prior to the consideration of Project-specific effects, in order to understand the vulnerability and resilience of the values and VCs to additional change.

1.4 Methods

The following methods were used to characterize Okanagan Nation rights and interests:

1. Define the priority valued components (VCs) and indicators via community engagement and verification with the Okanagan Nation Rev6 Project Review Committee for this submission (see section 1.4.1 below);
2. Establish as credible as possible a set of baseline conditions for the pre-contact era in the Okanagan territory with a focus on the Columbia River Basin in Canada, using a range of information sources available for all VCs (Sections 2, and 4 through 8);
3. Identify and describe the key projects, Crown decisions and activities that have changed Okanagan Nation VCs over time, and how things have changed (Sections 2, and 4 through 8);
4. Describe the cumulative effects context for each VC up to the present day (Sections 2, and 4 through 8); and
5. Set the context for where the two main components of the proposed Rev6 Project are within the Okanagan cultural landscape (Section 3), and then identify – to the degree possible with information available at the time of drafting – potential Rev6 Project impact pathways on Okanagan Nation VCs (Sections 4 through 8).

1.4.1 Valued Components and Key Indicators

Valued components and key indicators were identified through a series of focus groups and interviews with OKIB members and the Okanagan Nation Rev6 Project Review Committee. Focus groups and community meetings were held on OKIB's main reserve as part of the socioeconomic baseline and impact assessment coordinated by the OKIB Territorial Stewardship Department and The Firelight Group in October 2016. During these sessions, participants were asked to identify and discuss their core values. Transcripts from these sessions were transcribed and thematically analyzed in order to determine key priority values and associated indicators. The list of Valued Components and Key Indicators was verified by the Okanagan Nation Rev6 Project Review Committee in a workshop on November 18, 2016.

Table 1.1: Okanagan VCs and Indicators for this Study

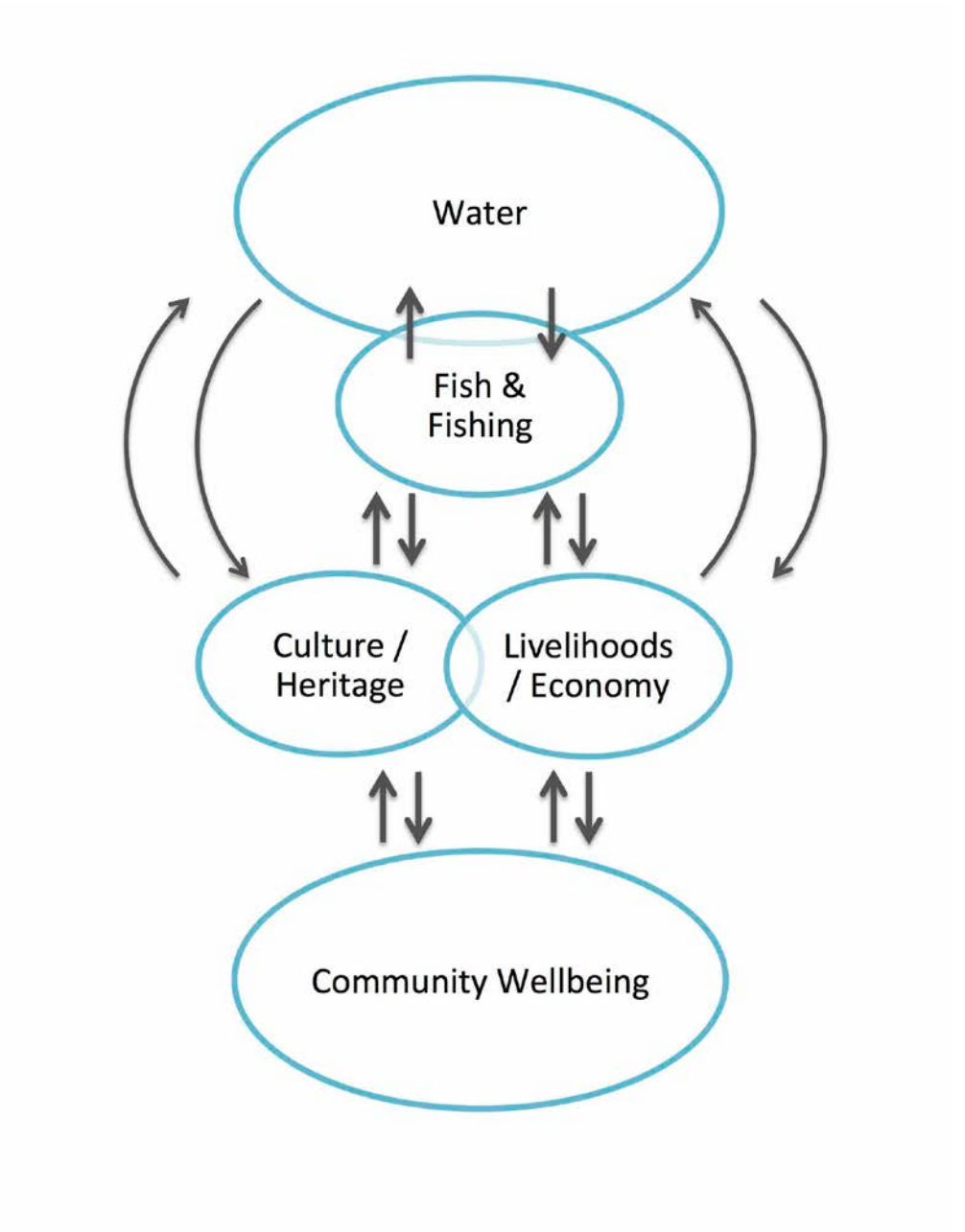
Okanagan Valued Component	Key Indicators
Water (Section 4)	• Access to healthy water for people, plants and animals • Syilx water stewardship; • Water quality • Water quantity • Healthy and resilient ecosystems to support both aquatic and terrestrial plants and animals • Accessible, undisturbed shoreline • The ability to navigate and move freely in waterways for transportation purposes • Enjoyment of natural, undisturbed waterways in the territory • The free movement of water and all the life within it • Pristine Columbia River
Fish & Fishing (Section 5)	• Food security • Access to preferred fishing sites in traditional territories • Safety on the water • Quiet enjoyment of the territory • Good return on effort (fishing success) • Healthy and abundant preferred fish species (salmon)

Okanagan Valued Component	Key Indicators
Okanagan Culture (Section 6)	• The ability to meaningfully practice and pass on Syilx laws and traditional knowledge as they relate to traditional cultural practices (dance, son, language, arts, place names, ceremony, etc.) • Ability to practice Syilx laws of stewardship and responsibility- tmix^{w} and tmx^{w}ulax^{w} • The ability to protect and respectfully manage burial and other archaeological sites • The ability to navigate a changing landscape and changing place names- the connection between land and language
Livelihoods & Economy (Section 7)	• Local employment opportunities consistent with Okanagan values • Access to education and training opportunities • Self-sufficiency • Ability to meaningfully practice Indigenous economy and livelihoods • Ability to harvest adequate quality and quantity of traditional foods and medicines • Ability to meaningfully practice Aboriginal rights for traditional food and medicine harvesting • Food Security
Community Wellbeing (Section 8)	• Access to adequate, affordable housing that is in good condition • Physical and mental health • Access to clean drinking water • Safe and affordable transportation • Access to recreational facilities, community infrastructure and programming for people of all ages • Ability to access and manage the land for cultural, health, spiritual and other traditional uses • Self-determination based on traditional laws, practices, and norms

There are both Aboriginal rights and other interests included as indicators. Okanagan understanding of its members' Aboriginal rights as related to this specific environmental assessment is identified in further detail in Section 2.3.3.

There are a number of relationships and linkages between the Okanagan identified VCs, as illustrated in Figure 1.1 below. There is an iterative relationship between each of the VCs, the health of each relying on the health of every other. Water is the central VC in this assessment, and to the Okanagan way of life more generally (see Section 4). All aspects of Okanagan livelihoods, culture, and wellbeing rely on healthy water and the habitat it provides for fish. Likewise, strong culture and livelihoods indicate that Water is being stewarded by strong Syilx laws and governance.

Figure 1.1: Relationships and Linkages Between Okanagan VCs



1.4.2 Spatial Boundaries for the Study

The following rough spatial boundaries were used to bound data collection for the specific VCs. Given the holistic nature of the study as per Okanagan values, cumulative impacts on any of the VCs at the regional (Okanagan territory) level are also considered as part of the context of resilience and vulnerability.

Table 1.2: Regional and Local Study Areas Used in the Study

VC	Regional Study Area	Local Study Area
Water	Columbia River Basin in BC	A 5 km LSA around Revelstoke Lake, the Middle Columbia River (MCR) and the Upper Arrow Lake
Fish and Fishing	Columbia River Basin in BC	A 5 km LSA around Kinbasket Lake, Revelstoke Reservoir, the MCR and the Upper Arrow Lake
Okanagan Culture	Okanagan Nation Territory	A 5 km LSA around Kinbasket Lake, Revelstoke Reservoir, the MCR and the Upper Arrow Lake
Community Well-being	Okanagan Nation Territory	Okanagan Nation Territory
Livelihoods and Economy: Traditional Livelihoods	Okanagan Nation Territory	A 5 km LSA around Kinbasket Lake, Revelstoke Reservoir, the MCR and the Upper Arrow Lake A 5km LSA around the Summerland Capacitor Station
Livelihoods and Economy: Wage Livelihoods	Okanagan Nation Territory	Okanagan Nation Territory

1.4.3 Temporal Boundaries for the Study

The temporal scope will focus on past, present and desired future practice of Okanagan rights and interests. To assist in identification of change from the past, a long backcast context of how Okanagan members lived and used their territory prior to contact is established in Section 2 in general, and for each subsequent VC-specific section (4 through 8).

Temporal boundaries of the assessment are presented from an Okanagan perspective. Given that many Okanagan rights and interests continue to be heavily impacted by both post-contact engagement with non-indigenous (settler) peoples, and especially the Revelstoke Dam and other

dams on the Columbia River, the following timelines will be used to frame the assessment of change over time:

- Pre-contact conditions up to approximately 1811 (arrival of European explorers followed by the fur trade);
- Change over time, from contact up until the 1930s when the first large-scale dams were constructed on the Columbia River, blocking fish – especially salmon – passage into the Columbia River system in Canada;
- Change over time, between the 1930s and the present day (the Hydro Era); and
- Anticipated future changes in the Project Case (Rev6 changes are the only ones subject to this futuring exercise). *Due to information constraints in the Part B materials and the lack of any cumulative effects assessment in the Part B materials, ON can only provide informed estimation re: impact pathways rather than full Project Case effects characterization at this time. This portion of the exercise will be completed if and when additional information regarding likely impact outcomes on specific VCs in the Project Case and mitigations by BC Hydro are provided to the Okanagan Nation.*

1.4.4 Data Collection and Analysis

Data collection relied primarily upon documents available in the public domain. The following documents and document types were reviewed:

- BC Hydro's partial draft Environmental Assessment Certificate Application documents, including the Project Description, draft Application Information Requirements (dAIR) and draft Part A and Part B materials;
- Formal agreements such as the Columbia River Treaty;
- Gray and academic literature describing dams on the Columbia River and their impacts;
- Published ethnographic and other historic literature describing the Upper Columbia River region and the Okanagan Nation territory and peoples;
- Publicly available government biophysical data (e.g., from the Water Office, Environment Canada);
- GIS shapefiles available from DataBC, Geogratis, Okanagan Nation Bands;
- BC Hydro infrastructure data available from BC Hydro public sources;
- The OKIB's Socio-economic Impact Assessment (SEIA) baseline study for the Project; and
- A multitude of Okanagan Nation documents, including written version of Captikwl, including Salmon Capitikwl, the Okanagan Nation Water Declaration (2014), available traditional use

study (TUS) and Aboriginal Interests and Use Study (AIUS) data, and other materials available in the Okanagan Nation Bands' archives.

As noted at the outset, a very small number of interviews with Okanagan Nation members were conducted and information from a site visit in 2015 by a group of Okanagan Nation members (see Appendix 1) was used to gather limited information about Okanagan values in the Rev6 area. In addition, PIB developed an initial assessment of potential effects of the proposed Summerland Capacitor Station from various internal sources (see Appendix 2).

Note on information gaps: There were substantial gaps in the data made available by BC Hydro in relation to Project-specific and cumulative effects and the health of the receiving environment. These have been identified for BC Hydro under separate cover. These gaps need to be addressed to the degree possible prior to the finalization of this Part C submission, if it is to be used in the final Application submission to the EAO.

1.5 Outline of this Report

The remainder of the report is laid out as follows:

- Section 2 provides a background on the primarily affected Okanagan Nation communities, their location, cultural background, economic system, worldview, governance systems and mode of life on the land. This pre-contact context is critical to understand in order to assess change over time on the Okanagan since contact, which is also the subject of Section 2's second half to create a cumulative effects context to date.
- Section 3 adds the proposed Rev6 Project into the equation, describing the proposed Project as per the Proponent's Project materials, and situating the Project's two main component locations in the context of Okanagan territory and use;
- Sections 4 through 8 examine the effects of change over time to date, and then adds initial consideration of impact pathways from the Rev6 Project, on the five primary Okanagan VC's chosen for this assessment:
    - Section 4: Water;
    - Section 5: Fish and Fishing;
    - Section 6: Physical and Cultural Heritage
    - Section 7: Community Wellbeing; and
    - Section 8: Livelihoods (especially terrestrial harvesting) and Economy.

2. Okanagan Nation Background and Cumulative Effects Context

This section provides an introduction to the Okanagan Nation- our territory, way of life and history, including a strong focus on the causes and outcomes of cumulative effects since contact with non-indigenous peoples. It also identifies Okanagan Nation's Aboriginal rights included in this Part C report, and provides an overview of how and by what change agents these rights have been adversely impacted to date, and recent efforts by the Okanagan Nations to protect and promote those rights. This creates the cumulative effects context of resilience and vulnerability against which future change and proposed projects like Rev6 need to be assessed.

2.1 The Okanagan Nation

The Okanagan Nation, also known as Syilx, have occupied their territory and managed their resources since time immemorial (Okanagan Nation Alliance 2006). The Syilx people hold Indigenous Title and Rights ("Syilx Title and Rights") throughout Syilx Territory, and have never ceded, surrendered or released any Syilx Title and Rights.

The Syilx people historically spoke the Nsyilxən language. Nsyilxən is a Salish language, which is distinct from other Salish languages like the Spokan, the Nlkamux, and the Secwepemc. Nsyilxən is spoken in all the districts of the Syilx territory with varying dialects.

Based on linguistic research of the Okanagan language, the different groups of this territory can be broken down to include: Northern Okanagan (along upper Okanagan Lake), Similkameen Okanagan (along the Similkameen River), southern Okanagan (along the lower Okanagan River), Methow Okanagan (along the Methow River), Sanpoil-Nespelem (along the Columbia River), Colville (along the Colville Valley) and Lakes (Columbia River, Arrow Lakes and Slocan Lake).

2.2 Potentially Affected Communities

The Okanagan Nation is made up of eight member communities:

- Okanagan Indian Band (OKIB);
- Westbank First Nation (WFN);

- Penticton Indian Band (PIB);
- Upper Nicola Band;
- Osoyoos Indian Band;
- Lower Similkameen Indian Band;
- Upper Similkameen Indian Band; and
- Colville Confederated Tribes in the United States (ONA 2010c).

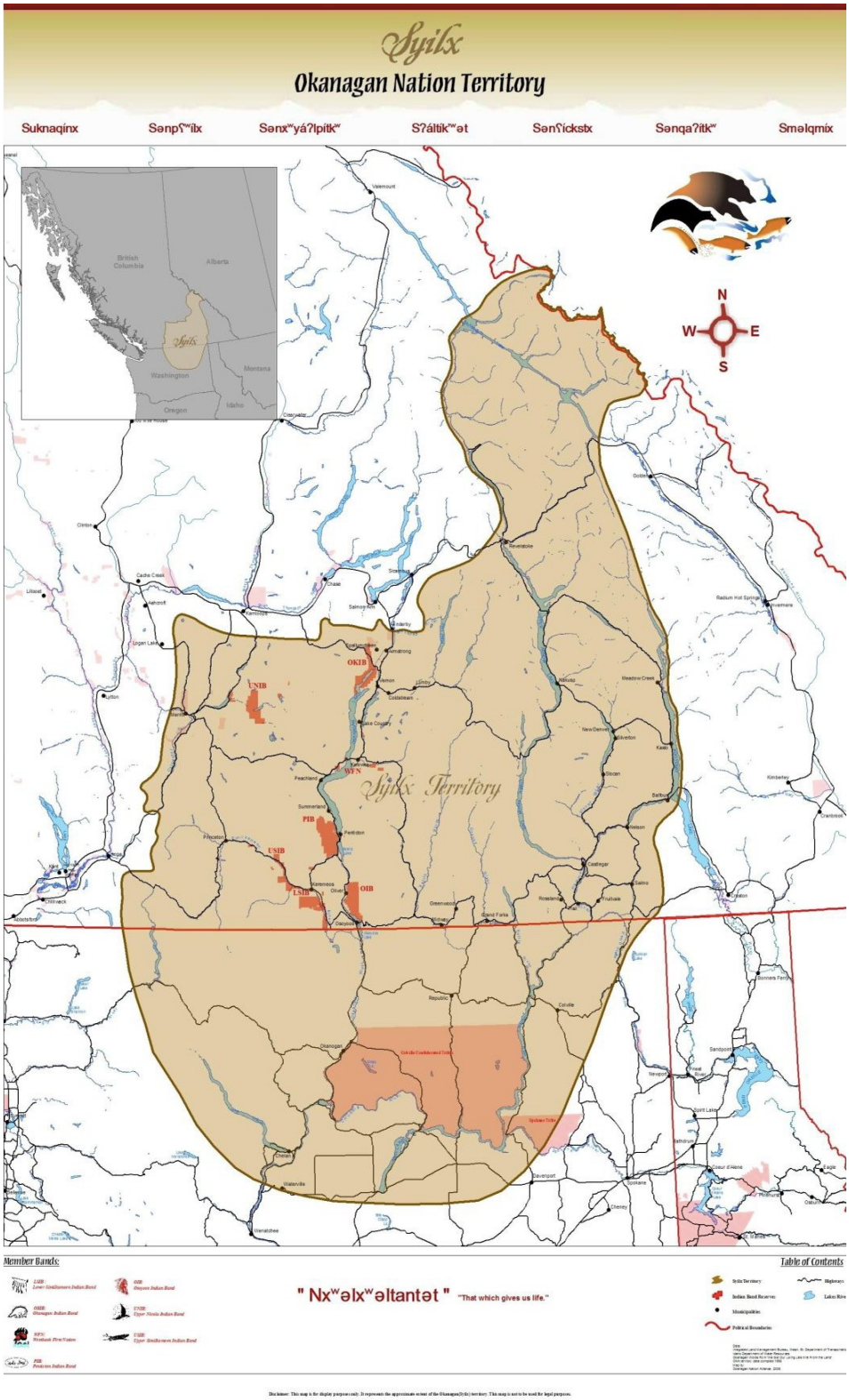
Of these, OKIB, WFN and PIB, as well as the Okanagan Nation Alliance, were identified in the BC EAOs Section 11 order as likely to be impacted for the BC Hydro Rev6. These four entities are thus the focus of this Part C report.

2.3 Okanagan Nation Territory

tmx^{w}ulax^{w} (“the land”) of the Syilx people covers approximately 69,000 km^{2} in British Columbia and Washington, stretching from the Mica Creek area north of snqaxɬʔstn (Revelstoke, B.C.), in the North, to Wilbur, Washington in the South. Syilx territory encompasses the land from Kootenay Lake to the East to the Nicola Valley in the west. The Syilx have lived on this land since time immemorial.

The Okanagan Nation does not recognize the divide at the 49th parallel division of the Okanagan Nation. It is all one territory.

Figure 2.1: Okanagan Nation Territory and Member Band Reserve Lands



2.3.1 Okanagan Indian Band

Okanagan Indian Band (OKIB) members refer to themselves as nk̓mapəlqs or Head of the Lake referencing both who they are and where they live. OKIB is comprised of six reserves located from Armstrong to Winfield and Westside Road along the head of Okanagan Lake. OKIB is the largest populated band in the Okanagan Nation and has six reserves, totaling approximately 11,282.50 ha (OKIB 2016a; Okanagan First Peoples 2008a). They are located at the north shore of Ellison Lake, the north shore of Swan Lake, the west bank of Otter Lake, south east of Otter Lake, and there are two at the north end of Okanagan Lake. The registered population is 1,997, with 819 members living on reserve (INAC 2016a). OKIB included Westbank First Nation until the early 1960s.

2.3.2 Westbank First Nation

Westbank First Nation has five reserves that collectively cover approximately 22 km^2 (approximately 5,340 acres), and two of their five reserves are located in West Kelowna, part of the larger city of Kelowna. Two of these were bought in 1984 (Medicine Hill Reserve no. 11, 15 km southeast of downtown Kelowna and Medicine Creek Indian Reserve no. 12, 10 km southeast of downtown Kelowna) and granted reserve status in 2001. Two of the reserves are located on the west bank of Okanagan Lake near the city of Kelowna (one directly west and one southwest). The fifth reserve is located on the left bank of Mission 3 kilometres south of downtown Kelowna. The registered population is 870 with 427 members living on reserve, and members have a registered total income of $29,307 as of 2011 (INAC 2016b). WFN is self-governing, and was part of Okanagan Indian Band until they separated in 1963 (WFN 2000).

2.3.3 Penticton Indian Band

sənpintkən (the Penticton Indian Band or PIB) has three reserves at the south end of Okanagan Lake that collectively cover 187 km^2. PIB is located four kilometers to the West of the City of Penticton, is bordered to the north by the City of Summerland, and Highway 97 runs both East and South of the community (ONA 2010h). Two of the reserves are adjoining and located at the south end of Okanagan Lake. The other reserve is between Okanagan and Skaha (or Dog) Lakes. The IR#1 reserve, immediately west of the City of Penticton in the southern Okanagan Valley within the Regional District of Similkameen (RDOS), occupies 19,277 ha (PIB n.d.). Their total land bases comprises 19,436 ha, and is geographically the largest reserve land base in the Province of British Columbia (PIB n.d.). PIB's registered population is 1064 with 569 members living on reserve (INAC 2016c), and the average total income was $25,480 in 2011 (INAC 2016c).

2.3.4 Okanagan Nation Alliance

The Okanagan Nation Alliance is the Tribal Council that facilitates collaboration between member communities in areas of common concern, including title and rights, land, water, food, culture, language, identity and sovereignty. The ONA was formed in 1981 and represents 8 member communities, including the Okanagan Indian Band, Upper Nicola Band, Westbank First Nation, Penticton Indian Band, Osoyoos Indian Band and Lower and Upper Similkameen Indian Bands and the Colville Confederated Tribes (ONA 2010g).

The Chiefs Executive Council (CEC) is composed of Chiefs or Chairmen as representatives from each community. Their mandate is to work as a government to advance and assert Okanagan title and rights over their Territory (ONA 2010d). The five departments of the ONA include Administration, Business, Fisheries and Aquatics, Natural Resources, and Wellness. These departments operate to implement the ONA's strategic priorities, which include promotion, enhancement and preservation of lands and resources; Okanagan indigenous history, language and culture; political, social, economic and cultural development; and of the environment, fish and wildlife resources in the traditional territories of the Okanagan Nation (ONA 2010b).

The ONA is a governmental body that represents its member First Nations and Native American Tribes to steward their traditional territory and further the interests of its members in topics of shared interest; including governance and cultural preservation.

2.4 Okanagan Ethnographic and Historic Background

This section provides an introduction and high-level overview of the historical attributes of the Okanagan Nation. It is not possible to fully construct the landscape or view the diversity of flora and fauna present during this time period. While each Okanagan band is distinctive, this section focuses on their general historical attributes, especially way of life patterns of land use and governance.

The first European contact with the indigenous Okanagan people occurred in the latter part of May or the first of June 1811 at the fishing station located at Kettle Falls (Brown 1911:172; Sam 2013). Carbon dated archaeological evidence places human habitation along the Columbia River about 9,000 to 11,000 years ago in the Lind Coulee region (Linenberger 1998:2; Hunn 1990:6). The Okanagan's population prior to contact was estimated at about 10,000, based on a 1903 census count of 2,579 and on Syilx oral narratives proposing that their numbers were formerly at least four times greater.

2.4.1 Okanagan Way of Life Prior to Contact

Four primary rivers characterize the Interior Plateau region within Syilx territory: the Columbia, Okanagan, Similkameen, and Kettle Rivers. These river systems sustained complex ecosystems in Syilx territory that people depended upon, such as providing spawning grounds for migrating salmon. These rivers are critical territorial references and boundaries for Syilx people, as well as vital passages for trade, food access, culture and way of life. For example, in the early 19th Century the Columbia River was vital for communication, transportation to salmon fisheries, and trade between the Arrow Lakes and Kettle Falls. Trade networks existed between the Syilx and neighbouring Nations, and waterways were used to hunt and fish together in their territory.

> *S-Ookanhkchinx"* [sukna?kinx] *in the Okanagan language translates to mean "transport toward the head or top end" this refers to the people traveling from the head of the Okanagan Lake to where the Okanagan River meet the Columbia River. In other words Okanagan Lake and Okanagan River as well as other water systems were the traditional transportation routes of the Syilx. (ONA 2010f)*

Alexander Ross, a North West Company (NWC) Fur Trader, described Syilx territory at first European contact in 1811:

> *The territory extended into the Columbia Basin area in the east to the summit of the Cascade Mountain range in the west, to the headwaters of the Columbia in the north and to the south extended a short distance beyond the confluence of the Okanagan and Columbia rivers. Within the boundary demarcations the geographic area was substantial and the ecological niches ranged from low-lying desert areas to high mountain alpine regions. (Sam 2013)*

Oral and archaeological records confirm that there was an abundance of resources in the Pre-contact Columbia Plateau that were integral to supporting a complex diet and way of life for people in this region. Access to seasonal harvesting grounds was an important part of fishing, hunting, trapping, and plant gathering, and formed a strong cultural connection to the land and water within their territory. The Columbia River History Project describes these seasonal rounds further, and the importance of these resources in subsistence diets:

> *The traditional lifestyle was one of hunting and foraging, with winter villages and seasonal camps that would be established for fishing or gathering purposes… those who lived farther upriver, where food supplies were more seasonal, the winter climate was harsh and the lifestyle accordingly was more nomadic. Roots, berries, animals, fish, wildlife—all were important to the tribes both as food and as elements of their spiritual beliefs. Land and water, which supported life, were sacred.*
>
> *The earliest inhabitants were nomadic hunters who relied on big game animals as an important part of their diet. Fishing began to be important to the subsistence pattern at*

least 8,000 years ago. By about 3,000 years ago, fish, animals and root crops were important in the diet, and shared food resources, particularly fisheries, may have led to cooperative political, social and religious structures among bands in shared geographic areas.

…By the mid-1800s Columbia Basin Indians had developed complex societies in discrete geographic areas, each with seasonal rounds of foraging, hunting and fishing. When necessary, tribal territories were defended aggressively against outsiders. (Harrison, Indian Tribes, supra note 23. In McKinney et al. 2016)

2.4.1.1 Salmon: A Vital Resource

Fishing was an important part of the Okanagan seasonal round, and salmon were one of the most important sources of protein for Okanagan people. As McKinney et al. (2016) write, "Salmon are iconic to the Pacific Northwest and their importance to tribes and First Nations cannot be overstated. The importance of salmon is evidenced in both oral and archaeological records, as well as oral histories documenting the arrival of salmon to the Interior Plateau region (Post 1938:12 in Sam 2008). Species of salmon migrating up the Okanagan and Columbia Rivers, included chinook, sockeye, and coho.

The Okanagan developed technologies and strategies to ensure salmon yields, including using pitch torches to attract fish at night, and tools including single- and double-pointed spears, dip-nets, wicker weir traps, and U-basket traps. Fishing was a well-organized and critical cultural and economic activity.

The salmon chief performed a ceremony to mark the catch of the first salmon, a ritual that symbolized the people's dependence on the annual salmon harvest. (Kennedy and Bouchard 1998).

Fishing in their traditional territories offers the Nsyilxən people a productive resource of many different species of fish. The most valued and prized are the various species of salmon because of the great quantity in the many rivers and streams that flow through the Nsyilxən territory. Elders speak about the abundance of the salmon on the Columbia River prior to the extensive damming projects that have emerged along this waterway. The plentiful and immense size of the salmon was well known and considered to be a major food source to the Nsyilxən people. Fishing camps were established at various locations along the Columbia River with target species including salmon, trout, white fish, Kokanee and Squaw fish. (ONA 2006)

There are some shared oral histories between Syilx Nations that demonstrate a collective understanding of the importance of salmon and the creation of key fishing spots within Syilx

territory. One Syilx story in particular documents the importance of salmon for Syilx people, and centers around Coyote (Snk'lip) [sənkl̓ip] bringing salmon upriver to the Syilx people as a gift. A common thread in each version of this story is the gift of salmon to Syilx people by Coyote. Some versions of this story focus on Coyote being chosen by Creator to bring this gift, while others describe Coyote's gift of fish as an exchange for marriage. Because of this, salmon were introduced to the Columbia River, the Okanagan River as far as Okanagan Falls, and avoided the Similkameen River when Coyote was refused by people there (Teit 1917; Clark and Inverarity 1953).

Records also demonstrate that salmon runs were also an integral part of traditional seasonal rounds, as described by the Okanagan Nation Alliance (2003):

> *In May or early June, early salmon runs would begin to appear, root digging would take place in the late spring and early summer, berries and seeds would be gathered throughout the summer and early fall and upland hunting would take place in the fall. (Grabert, Garland F. 1974 in ONA 2003, 3)*

During the early contact period the majority of the *Syilx* tribes were dependent on the salmon that traversed the Columbia and Okanagan River systems. David Chance (1973:14) estimated that Interior Plateau Salish tribes on average relied on salmon for 50 per cent of their subsistence.

2.4.1.2 Other Harvesting Activities

In addition to salmon, other animal species that were commonly relied upon by the Okanagan included the following, noted by Teit (1930):

> *three species of deer, elk, big-horn sheep, caribou, and black and grizzly bear. Antelope were scarce and goats were uncommon… The principal smaller kinds of game hunted for food were rabbits, marmots, and beaver. Ground squirrels and tree squirrels were hunted by boys for sport, and their flesh was sometimes eaten … They were ordinary still hunting; approaching game in disguise of the game itself and by imitating its actions, or by approaching in disguise of some animal familiar to it; driving into ambushes or to places such as passes, where hunters were concealed; drivuig mto corrals of nets or entanglements; drivmg over clifl's; driving deer with dogs to baj' in creeks and bears into trees; driving (generally with dogs) to crossing places of rivers and lakes, where hunters lay in wait; encirchng; shooting from pits, trees, and ambushes at certain favorite watering places or salt licks; riding down on horseback in open country ; watching for deer, caribou, and bear at swimming places and overtaldng them with canoes; calling was also practiced to some extent… It seems that the*

> *Okanagon and Similkameen used dogs more extensively in hunting than the other tribes…*

Hunting was part of a larger seasonal round that was an important part of life for Okanagan people, and although men hunted individually and in small groups, at other times both men and women hunted together, and women were part of the process of driving game and shooting (Teit 1930, 243). The importance of deer to Syilx people as a primary food source has been highlighted in many sources, and communal deer hunting throughout the region was common (Teit 1930; Kennedy and Bouchard 1998).

Teit describes the characteristics of seasonal harvesting rounds circa 1904-1909:

> *most bands had four great hunts every year: A spring hunt for deer and sheep, which usually was not very far afield and comparatively short in duration; a late fall hunt for deer, sheep, elk, and bear, the parities sometimes going far away and remaining out for about two months; a midwinter hunt for deer, and a late winter hunt for sheep. During the spring and late fall hunts the women busied themselves digging roots; and during the summer and early fall, when individual hunting only was carried on, they attended to the gathering and curing of berries and roots. Skins were dressed more or less all the year round, but probably chiefly in the wintertime. In the winter sheep hunt mostly ewes were killed and the rams were let go. The latter were hunted on their summering grounds when fat by small parties in the late summer and early fall, either by still hunting (the chief object being to catch them in their lairs on hot days), or with dogs (Teit 1930:243)*

Carstens (1991, 8-9) and Thomson (1994, 97) elaborate on this seasonal round, describing:

> *In summer the pattern changed as men concentrated more and more on hunting while the women gathered all kinds of berries and wild fruit for immediate consumption. The women also dried and stored part of the berry and root crop while they were cooking and drying fish and meat for use in the winter. Thomson (1985) provides details of food-gathering operations by women and children, demonstrating the enormous value of wild crops to the band… After the hunt, or the catch, women took charge of the animals and fish, and prepared them for eating, distribution, curing, smoking, and storage… In fall the summer villages prepared to break up and there was a concerted effort by the women to dig roots, while the men were involved in intensive hunting of game and birds. By late fall (the Okanagan's fifth season) people began the process of moving back to their permanent winter villages while they carried out last minute foraging before the winter. The more food stored, the more comfortable the cold months were, enabling people to concentrate better on general education and special*

> *instruction in myth, legend, and the details of communal ritual. While co-residential families constituted primary production units they could only function as part of larger complexes such as a village or band. Some families assumed specialized economic functions (e.g., fishing, tanning, berrypicking) within the context of these wider production units. Individuals also acquired specialized knowledge and skills in hunting, fishing, basket-making, leatherwork, and so on. Some were recognized for their magical and medical knowledge which was highly valued in many facets of life. All these diverse aspects of production, together with age and gender divisions of labour, made for a complex domestic economy. (Carstens 1991, 9)*

Throughout the plentiful months, until the fall deer hunt ended in October, the Okanagan people migrated as individual families to minor resource sites and, when necessary, reassembled in larger groups at major resource locations. When resources such as fish and berries were found in close proximity, lengthy or even year-round residence was possible.

> *Life in these seasonal villages was loosely structured with each family retaining considerable independence as well as the freedom to change its association from one village headman to another. Headmen played a mediation role but had little real authority, except the influence which they acquired through their redistributive function, which in turn depended on their ability to organize economic activities, such as the fall deer hunt or the building of a fishing weir." (Thomson 1994, 97)*

Okanagan lodges were also seasonal, and were constructed based on whether they were temporary or permanent. Winter dwellings, referred to as "earth lodges", were built into the ground and covered with low conical roofs, while summer lodges were circular or oblong and covered with tule mats over a wooden frame (Carstens 1991, 8). Winter lodges were often in low-lying areas, with access to water, fuel, and game. They served as strategic semi-permanent sites and central storage depots for incoming resources from hunting camps and other temporary camps that would be established closer to resource sites for harvesting and processing (Thomson 1994, 97).

Winter villages were left as the harvesting cycle began in early spring, and groups would divide to begin harvesting deer and sheep, and plants.

Plant harvesting as part of a seasonal round was also a key reason groups would travel long distances to the southern parts of their territory, and to higher elevations as the season progressed. Higher elevations ensured a longer harvest of certain plant species, and plants such as camas, wild onions, wild celery, Saskatoon berries, and wild potatoes were ready for harvest earlier in the season in the southern reaches of Okanagan territory than further north (Sam 2008, 21). Bitter-root was a staple harvest that could be easily dried for winter, and along with Saskatoon

berries were the most important plant foods for Okanagan people (Turner et al. 1980; Sam 2008, 21).

As well as being a vital food source that Okanagan people relied on, plants were also a large part of Okanagan culture, and several spiritual naming ceremonies for girls, as well as “first roots” and “first fruits” ceremonies were connected to plants and harvesting cycles. These connections to plants, both for food and cultural reasons, demonstrate the integral role plants held for the Okanagan people and their way of life. In addition, seasonal rounds to dig roots and collect plants were also part of a political assertion of sovereignty over Okanagan territory and an assertion of harvesting rights in these areas (Sam 2008). Turner et al. (1980) describes how plant importance is “reflected in the large botanical vocabulary in the Okanagan-Colville Language.”

In winter, travel was by snowshoe, and in summers travel was commonly by dugout canoes, which were made by Okanagan groups. Waterways, and the Columbia River especially, were important as a mode of transportation and communication, vital for economic and social relationships, and subsistence (Bouchard and Kennedy 2004).

Access to a territory rich in a wide range of food resources ensured a diversity of harvest for Okanagan people that made them less vulnerable to periods of famine. As a result the health and vitality of Okanagan people is directly tied to the health of their territory and the staple foods they accessed on the land.

Integral to the system of land tenure are ecological management protocols to support sustainable harvesting practices and the conservation of resources. Okanagan people had economic strategies to address lack of significant annual surpluses, including the communal dispersal of food such as preserved game meat and fish, which was regulated by a headman, and individual family-based management of other resources.

Extensive trade networks also connected Okanagan people to neighbouring groups, and were part of a larger, versatile economic system of exchange and resource management within their territory. “The Syilx were not an agricultural society but instead relied on harvesting the vast amounts of seasonal flora and fauna within their traditional territories for subsistence purposes and trading extensively to disburse surplus goods” (Sam 2013, 15). Other “Syilx trade items included dried salmon, deer-nets, skin bags, dressed moose-skin, scent, paint or red-ochre, horses, bark made into twine for snares, bone or horn beads, arrow points, roots, wild hemp and berries” (Sam 2013, 15).

The archaeological and ethnographic data demonstrate the reliance of the Syilx on resources and seasonal rounds within their traditional territory, as well as rules and laws that governed resource management and contributed to traditional Syilx ways of life. These are discussed further in Section 2.4.2.

Summer months in the seasonal round also brought a return of berry, plant and mushroom harvesting, including:

Berries:

- Soapberries
- Wild Strawberries(sttq'm'iɬmíx)
- Raspberries (tall, trailing, dwarf)
- Blackcap (blackberry, black raspberry)
- Thimbleberries (palpl=qn)
- Saskatoon berries (síyaʔ)
- Chokecherry (sk lw s=áɬq)
- Grouseberry
- Rosehips
- Crabapple
- Huckleberry, red
- Huckleberry, blue (st x=ałq)
- Blueberries (oval, leafed, bog)
- Cranberries
- Elderberry, blue (c kʷkʷ=iɬmlx)
- Currant
- Oregon grape (sc rs=íɬmíx)
- Juniper berries

Mushrooms:

- Shaggy manes
- Pine
- Morel
- Chanterelle

Plants:

- Bitteroot (s*ṕ* iɬm)
- Tiger lily (stx=cin)
- Balsam root (smúkʷaʔ=xn)
- Camas (ʔítxʷaʔ)
- White Camas (c xʷƛ̓=úsa)
- Indian onions, nodding (x*ḭ* íwaʔ)
- Indian potatoes (skʷn kʷín m)
- Chocolate tips (ayu7)
- Rattle snake plantain (nki7íwṡ)
- Cow's parsnip/Indian rhubarb (xʷxʷt=iɬp)
- Wild mint species (tʕʷaʔtíʕ́ʷaʔ)
- Labrador Tea/Indian Tea/TrappersTea (xʷxʷƛɬm =íɬp)
- Yarrow (kw`ets`kw`ets`wi7húp7s)
- Kinnikinnick (skʷlis)
- Wild raspberry stems and/or leaves (ɬʕá laʔ)
- Huckleberry leaves (packɬ ist xʷatq)
- Sage (nq nq tiɬp)
- Devil's club (xaxagáy̓lhp)
- Strawberry leaf/root
- Willow (stkcxʷ=iɬp)
- Juniper stems, leaves, roots (snc íc q=p=naʔ)
- Chokecherry bark (sk lw s=áɬq)
- Hemlock (ciqʷlx)
- Alder (qʷɬn=iɬp)
- Poplar (m*ḿ*m*ḱ*t=iɬp)
- Douglas fir (cq =iɬp
- Larch (ciqʷlx)

- Cottonwood (mulx)
- Birch (qʷqʷɬin)
- Wild ginger (spuʔ=s=íɬmx́)
- Prince's pine (tkkaʔkaʔɬí=íkaʔst)
- Pine (sʔatqʷ=ɬp)
- Spruce (sk w k w =iɬp)
- Yew (ckʷ=ink)
- Cedar (ʔastkʷ)
- Balsam fir (mr=iɬp)
- Tree Fungus (kʔamt=álqʷ)
- Lichen (tqʷsqʷsp=isxn)

2.4.2 Okanagan Governance System

> *The right of being a Syilx is a responsibility, first to know and follow the natural laws to make sure of healthy generations to come, and second to follow the laws of a community for the same reason. (Armstrong et al. 1994, 3)*

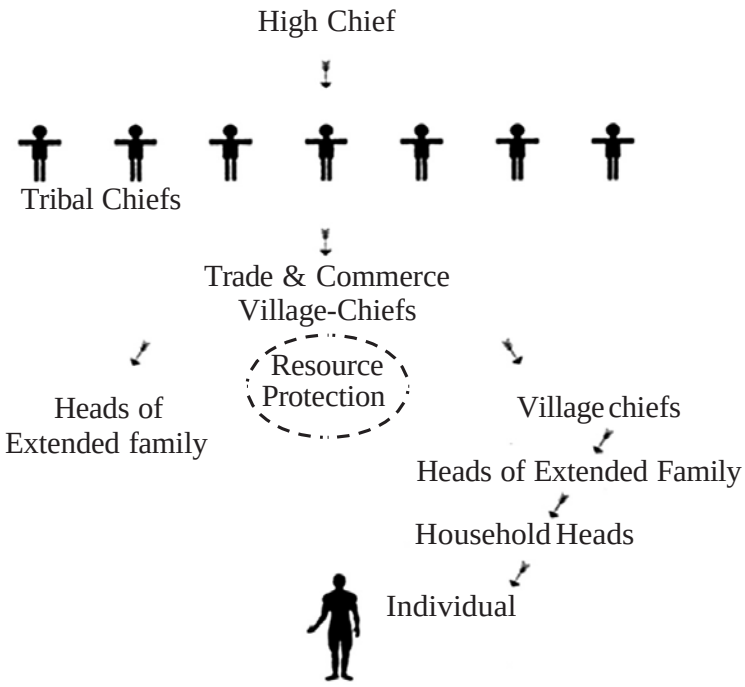
2.4.2.1 Governance Structures

The social organization and authority structures of the Okanagan are an intricate system of leadership based on lineage, skill, task, knowledge, and spirituality (Kennedy and Bouchard 1998).

Okanagan laws are held in the Captikʷɬ, oral histories that are passed down from generation to generation, transferring the knowledge of what it means to be Syilx. Traditionally, the system of Syilx law was upheld by a hierarchical governance system that spanned the territory.

Figure 2.2: Okanagan First Nation Governance System

Diagram Showing the Structure of the Governance System



Source: Okanagan First Peoples – Governance: http://www.okanaganfirstpeoples.ca/governance.cfm

Okanagan society was organized in a hierarchy, from the High Chief down to the tribal chiefs and village chiefs, the last of whom were appointed through a hereditary system (Okanagan First Peoples 2008b). The High Chief/Grand Chief represented the laws of the whole Syilx at the nation level and would travel to visit each district. The High/Grand Chief was responsible for balancing human needs with the natural laws. Protection and careful management of the lands' resources meant protection for future generations.

Tribal Chiefs then represented each district and were responsible for designating times for hunting, fishing, and berry picking. Tribal chiefs regulated the allocation of resources, as in the case of Knkannaxwa (a salmon chief in the late 19th century) who oversaw the division of salmon for the Syilx tribes (Armstrong et al.1994, 4). Different chiefs administered different parts of the ecosystem, separately for the creatures of the land, water, the underground, and those things that grow on the land (Chief Black Bear, Chief Spring Salmon, Chief Bitterroot, and Chief Saskatoon Berry, respectively), ensuring that resources were not over-exploited.

Each district had its own village chiefs. Village Chiefs were appointed following a hereditary system or *qaʔɬ ilmìxʷəm* and ensured that the laws of the village were kept (Okanagan First Peoples 2008b).

The designation of the international boundary in 1846 was the first colonial interference in this system. The solution at that time was the creation of a second southern High Chief responsible for reporting to the main High Chief. Further interference with Okanagan Nation governance would come in the 1880s through the administration of elections by Indian Agents (Thomson 1985; Thomson 1994).

Today there is a High Chief/Grand Chief, but this role is quite different than it was historically. The Chiefs Executive Council (CEC) is composed of Chiefs or Chairmen as representatives from each community. Their mandate is to work as a government to advance and assert Okanagan title and rights over their Territory (ONA 2010a).

Historically Chiefs also governed in economic and social domains, functioning as advisor, conflict manager, and aid worker, policed their respective jurisdictions, and more (Thomson 1985). A Chief's authority and power was based on the moral and social capital built over their lifetime and through their family lineage; however, not all chiefs were hereditary and some were chosen based on their proficiency or knowledge in a certain area of life.

> *Within all of the river Nations' governance acts, were some very important and well-structured protocols. Each of the protocols maintained balance between the natural world – the environment, to the community, on to the Nation and out and on to other tribes or Nations. (Baptiste 2016, see Appendix 1)*

The Syilx People has always had established protocols of cooperation. These protocols were implemented by the Chiefs authority and reinforced through feasts, ceremonies, potlatches, dances, trading ceremonies, swanx pow-wows. The social organization and authority structures of the Okanagan are an intricate system of leadership based on lineage, skill, task, knowledge, and spirituality.

The land was also actively managed by the Okanagan in order to care for the territory, for example, through controlled burns in order to foster the growth of valued plants (Armstrong 2007). Management of the land is viewed as a responsibility and only possible through the transmission of specialized knowledge on the behaviour of the forest and meteorological conditions (Armstrong 2007).

> *When we [the Okanagan people] were created, a covenant was made that we, as Syilx people, were required to act as caretakers of our lands and in return we would be looked after. This is our ʂtɬtaɬt, [our right and our responsibility]. (Okanagan Nation Water Declaration 2014. See Appendix 2)*

2.4.3 Okanagan Laws and Norms

The relationship between the Okanagan people and the natural world is the basis for Okanagan laws, norms and guiding principles:

> *Within all of the river Nations' governance acts, were some very important and well-structured protocols. Each of the protocols maintained balance between the natural world – the environment, to the community, on to the Nation and out and on to other tribes or Nations. (Baptiste 2016)*

The laws and structure of Okanagan society are dictated, in large part through Captikʷɬ: (stories) that provides instruction on norms and values, or "natural laws" (Sam 2008; Armstrong 2007). Again highlighting the intimate connection between the Okanagan and the natural world, Captikʷɬ are often communicated through interactions between (sometimes anthropomorphic or symbolic) animals. As articulated by Armstrong (2010, 145): "Coyote … made the laws for the xatmasqilxw – first people … which results in establishing ethics observed by the Okanagan Syilx." One Captikʷɬ, "The War with the Frogs", for example, describes protocols and procedure around land ownership and boundaries, authority and "democratic" values in problem-solving, and international conflict, including war and compromise, through a tale of the Frog People and Swallow People (Sam 2013).

It is essential to understand that from the Okanagan worldview, the environment is inseparable from the autonomy and identity of the Okanagan Nation, and that stewardship of the environment is a great responsibility and requirement of being Okanagan. From the Captikʷɬ and other teachings, the Okanagan understand that good governance also involves the ability to live with one another; from the family to the scale of the Nation, each person is also responsible for one another and the land (Armstrong et al. 1994, 5). Reciprocity and sharing are bedrock principles of the Nation.

The Nsyilxəɴ word commonly used to refer to all living things is timixʷ. Timixʷ includes everything alive – the land, water, animals, people, plants, and so on. The Syilx concept of land encompasses more than the physical geography of place, it includes the spiritual connections of everything living on and within it. Underneath all of the timixʷ is tmxʷul'axʷ, which is the core spirit from which all of creation arises and which unites everything. The literal translation of timixʷ is a quantity of strands spreading outward from a source, the idea that many living things both seen and unseen are all bound to one place. This way of visualizing and constructing the land through the interconnected layers of all living things is in turn reflected through Syilx history and language.

The Syilx have an ethical responsibility to maintain and live in a co-existing and reciprocal relationship with the natural world as it, in most instances, provided a more than adequate supply of roots, berries, large and small game (e.g., elk, deer, sheep, bear, prairie chicken, grouse, water fowl, etc.), and a rich protein source in the salmon. Access to a territory rich in a wide range of food resources ensured a diversity of harvest for Okanagan people that made them less vulnerable to periods of famine. As a result the health and vitality of Okanagan people is directly tied to the health of their territory and the staple foods they accessed on the land.

A common principle represented across Okanagan governance, laws, and values is the need to sustain these resources for the benefit of future generations. Armstrong (2007) articulates this cornerstone aspect of Okanagan culture:

> *The laws and knowledge of the Okanagan people regulate the resources. The Okanagan word which describes the process that our people follow in order to come to decisions about resources is kʼəɬʕacʼxən which is a complex word carrying many meanings. One meaning is to "look underneath" the obvious. Underneath what is here today, there is a long line of people, and creation, to be considered in the future. The word also is used to refer to the process of tracking an animal and suggests the need to look beyond the immediate to see underneath our own tracks to see where the footprints will lead. (Armstrong 2007, 7)*

Okanagan's laws and norms include (but are not limited to) prescriptions and principles for interacting and relating with the land, especially with respect to future generations, including: [4]

- Sustaining the diversity of species and their habitats in perpetuity for the well-being of future generations;
- The land is at the centre of how we are to behave; without land we are endangered as a life form and we in turn endanger other life forms;
- Water is a relation who provides life for all living things and must be treated with honour, respect, and reciprocity;
- Activities in the community will be conducted with respect for the land *[tmxʷulaxʷ],* traditions and way of life [naʔkʷlʼməntət], prayer *[nkʼʕamәntәt];* strength and help), and belief system and spirituality [iʔnunxʷinaʔntət];
- The right of being Syilx comes with a responsibility to follow the natural laws and make sure the land is healthy for generations to come;
- Preserve the land in its natural healthy state for each generation through knowledge and the practice of natural law; and
- *kʼəɬʕacʼxən*: "always look underneath our actions to see how our actions or the tracks that we leave are connected to the future, to our grandchildren, to the continuation of all creation, and to the tracks that they make on the land into the future" (Armstrong 2007).

[4] These laws and norms are derived from the Okanagan Water Declaration (Okanagan Nation 2015), Original People (Armstrong et al. 1994), the Okanagan Nation Declaration (Carstens 1991), Guiding Principals of Suxwtxtem (Upper Nicola Band n.d.), and Jeanette Armstrong's 2007 Affidavit for the Supreme Court of British Columbia in Chief Dan Wilson vs. The Queen (Armstrong 2007), and have been verified by the Okanagan Nation Rev6 Project Review Committee.

2.4.4 Okanagan Rights

Okanagan Aboriginal Rights and Interests are protected under S.35 of the *Constitution Act* of 1982. Okanagan people hold these Aboriginal rights collectively and have never ceded any of these rights at any time in our history. The rights as understood below are not to be read as an exhaustive definition of Okanagan member Nations' rights.

- Right to hunt in territory;
- Right to fish in territory;
- Right to trap in territory;
- Right to harvest food and medicinal plants in territory;
- Right to harvest raw materials from the land (e.g., trees, bark, stone);
- Right to access and freedom within our territory;
- Right to clean water from the territory;
- Right to carry equipment and materials necessary for hunting, fishing, trapping, and harvesting, including such things as arms and ammunition, spears, steel bladed instruments, etc.;
- Right to manage forest through prescribed burning and stand management;
- Right to mark and otherwise identify traditional use sites;
- Right to develop traditional use sites, for example constructing a camp, lodge, trail, or boat launch;
- Right to self-governance, independence and ownership of our lands, territories and customs as the basis for the preservation of our knowledge (Suxtem Policy);
- Right to exclusive ownership of Okanagan intellectual and cultural property, and control over the dissemination of such property and knowledge (Suxtem Policy);
- Right to decide how the lands, waters and resources can be used;
- Right to manage the lands, waters and resources; and
- Right to take economic benefits from the lands, water and resources.

2.5 The Weight of Recent History: Change Over Time Since Contact

We have shown that the Okanagan were a self-governing, self-sufficient people prior to contact with European peoples. They were widely distributed across the Okanagan and Columbia River watersheds and enjoyed a vibrant resource-based economy.

That changed with contact. This section of the report examines historic documentation of change over time to establish total cumulative effects loading on the Okanagan since contact with European cultures.

2.5.1 Contact, Settlement and Colonialism (1811-1930s)

Even prior to direct European contact, during the 1770s, Syilx populations were severely reduced due to the introduction of deleterious European diseases. The severity of actual losses will never be known, yet according to oral sources given by various individuals throughout the Syilx territory it was a common occurrence for entire villages to be wiped out. The rapid spread of smallpox could be attributed to the prolific Interior Salish trade networks that extended beyond the Rocky Mountains to the Plains country and to the coastal regions of the Pacific Northwest. At first contact the indigenous people of the Interior Plateau were the first generation survivors of the virulent pandemic (Scheuerman 1982, 21; Ray 1933, 21).

2.5.1.1 Fur Trade

Syilx first contact was with fur traders in 1811 when David Stuart of the Pacific Fur Company ascended the Columbia River and built Fort Okanagan (Kennedy and Bouchard 1998; Thomson 1985). Syilx's traditional economy was flexible and quickly adapted to take advantage of the fur traders' presence. Early HBC maps record and depict the movement of Okanagan people between the Okanagan, Columbia, and Similkameen valleys as early as 1827 (ONA 2006, 6).

Unlike other Nations, the Okanagan did not rely on providing pelts as a primary trade good with the fur traders. As they were already experienced with raising horses prior to contact (horses were introduced to the area in the first half of the 18th century), Syilx ancestors were able to sell their horses for the HBC brigade. Over time, Syilx ancestors also started raising other stock such as cattle and growing potatoes for trade with the HBC. Syilx were known as experienced stock-raisers by the time of expanded European settlement (Thomson 1994). The fur trade introduced Syilx ancestors to European clothes, medicines, guns, steel traps, and tobacco, among other goods (Thomson 1985; Thomson 1994).

2.5.1.2 International Boundary Setting

In 1846 the Treaty of Washington established the international boundary between the United States and what would become Canada, splitting the territory of the Okanagan Nation in two. While the border did not impair relationships between Okanagan north and south of the border as understood by these relations, they were now faced with different emerging systems of government, missionary orders, and other forms of colonialism (Sam 2008; Thomson 1985). Further, the border impeded access to village sites and key fishing locations for Okanagan on either side.

2.5.1.3 Early Settlement

During the fur trade period (1811–1848) European traders had only traversed Okanagan ancestral lands and did not settle or even build a post. It was settlers that would truly change the physical and political landscape of the region. European settlement in the area emerged due to a number of reasons: mining, ranching, the establishment of the mission, and the exit of the HBC. The first influx of settlers occurred in 1860 around the newly constructed mission at Mission Creek and to the south around the placer mine at Rock Creek. The Roman Catholic Oblates of Mary missionaries had arrived with a mandate of forcing religious and social change among the Indians in the region and by 1864 they were servicing an area from Thompson River to the International boundary.

On August 2, 1858, the Colony of British Columbia was established. This brought about a number of changes including the promotion of European settlement and the revoking of the HBC's exclusive rights of trade on the mainland in September of the same year (Thomson 1985, 24). In order for settlement to proceed, Governor James Douglas sought agreement with the Okanagan Indians through an imperial agreement in 1860. This agreement was tentative and never concluded but did include the demarcation of reservations by local magistrates that were expected to include exclusive rights by Okanagan Indians over village sites, fields, fishing sites and other areas of interest and use and could be whatever size the Okanagans demanded (Thomson 1994, 101-102). Magistrate W.G. Cox worked with Okanagan Nation groups to mark out the boundaries of their new reserves. For example, OKIB received most of the good bottomland at Head of the Lake with their fishery locations, garden plots and a winter ranging area for their livestock (Thomson 1994).

As settlement began to expand due to first ranching and then the planting of orchards, conflict followed as settlers sought the land held by Okanagan ancestors. J.C. Haynes, a new Magistrate who was sympathetic to the settlers, denied the rulings of Cox in 1865 and reduced the reserve at Head of the Lake from approximately 200 acres to 25 acres per household (Thomson 1994). Within 15 years of the Haynes reduction, European settlers monopolized the good watered bottomland in the Okanagan valley (Thomson 1985).

With confederation, the dominion government became responsible for Indians in B.C. in 1871. The per-family reserve land reduction by Haynes and the appearance of fences (from settlers) on the landscape inhibiting Okanagan traditional practices and stock-raising increased tensions and lead to the threat of war by the Okanagan and neighbouring nations (Thomson 1994). In 1877 the newly formed Indian Reserve Commission was sent to the Shuswap and Okanagan to resolve these tensions through the formal establishment of reserves (OKIB 2016c, para 12).

Other government actions also dispossessed Okanagan Nations of their traditional territory. Pre-emptions for railways occurred in the 1880s, further changing the landscape.

The military also infringed on Okanagan Territory through the use and appropriation of Okanagan lands for military active training and artillery starting in the early 1900s and continuing after the end of the Second World War up until 1953. Ordnance used in training areas around Vernon included pyrotechnics (e.g., thunder flashes and smoke bombs), small calibre arms, grenades, mortars and tank and anti-tank rounds (Department of National Defense and the Canadian Armed Forces 2016, para 12). This extended use over 50 years has left approximately 2,800 hectares of OKIB land riddled with unexploded ordinance (MacQueen 2016, para 3).

The Gold Rush within the Okanagan Nation's territory was brief but had lasting effects. The gold rush started south of the border in Fort Colville in 1855 and moved north to the Fraser River in 1858 and Rock Creek in 1859/1860 (Thomson 1985, 1994). The discovery in Rock Creek brought over 500 miners to settle in the area. The influxes of miners lead to the establishment of wagon roads, trails, rail, and steamships in the region, which further facilitated settlement. A wagon road was constructed from Kamloops to Priest's Valley (Vernon) in 1871 and was extended to Mission Creek in 1875 (Thomson 1985, 26). The Canadian Pacific Railway (CPR) was completed in 1881 and due to the efforts of local businessmen a rail line was built and completed off the mainline from Sicamous to the head of the lake near Priest's Valley in 1892 (Thomson 1985, 26). The CPR also placed steam ships on Lake Okanagan to travel and move goods from Okanagan Landing to the lower parts of the lake at this time (Thomson 1985, 26-27).

All of these transportation infrastructure projects opened up Okanagan territory to outsiders and Okanagan members actively participated in the cattle industry, the first agricultural industry in the area. The Commonage was established in 1877 as a crown grazing land open to use by Okanagan people and settlers. Okanagan Nation members' and settler's cattle grazed freely on this range with no written rules applied (Thomson 2016). Unfortunately, a number of forces reduced the cattle industry at the turn of the century. Prices for cattle fell in the early 1890s due to increased competition from the Northwest Territories (which included Alberta and Saskatchewan at this time) and large European firms started to buy farmland (Thomson 1994). The commonage was released for settlement in 1892 (Lake Country Museum 2016a) and subdivided into lots for sale in 1893, thereby removing Okanagan Nations' area for grazing (Lake Country Museum 2016b).

The Residential School System

The residential school history, with its legacy of assimilation and abuse, is an integral part of early colonial era for Okanagan Nations. As early as 1865, the Roman Catholic Oblates in the region attempted to establish a school for boys at the Okanagan mission that would follow a formula of education later adopted by residential schools. Okanagan parents were reluctant to send their children to this school and with good reason. The boys school at the Okanagan Mission was closed in 1868 in part because it was self-funded but more importantly because in the three and a half years of operation with only 21 students, there were 6 deaths and 9 desertions (Thomson 1985, 98). The refusal by Okanagan and other First Nation parents to pay for and send their children to the Okanagan mission boys school lead to its closure.

In 1886, Indian Agent Joseph William Mckay, recommended that a school supported by the Department of Indian Affairs be established after discovering that no Okanagan children were attending school in the Kamloops-Okanagan Agency (Thomson 1985). It was decided that a residential school should be built at Kamloops instead of creating several day schools near reserves so that children could be kept from the “native influences” of their parents (Thomson 1985, 105). The Kamloops Indian Industrial School was established in 1890 and operated until 1978 by the Roman Catholic Oblates (BCTF 2015). In the early years, attendance was voluntary, which allowed parents to keep their children at home. This changed in 1920, when amendments made to the Indian Act made it mandatory for every Indian child to attend a residential school (BCTF 2015; UBC 2009). The Kamloops school was one of the largest residential schools in Canada with over 400 students at its peak of operations in the 1950s (BCTF 2015, 14).

After 1890, the majority of Okanagan children were sent either to the Kamloops Indian Industrial School or further from home to St. Eugene’s Indian Residential school (located in the Kootenay Agency 1898–1970) in Cranbrook (Okanagan First Peoples 2008c). Conditions at both schools were atrocious, with systematic abuse and neglect as well as the rampant spread of communicable diseases such as tuberculosis (BCTF 2015). Forty-seven children died during the first seven years of St. Eugene’s (Thomson 1985, 106).

Cattle ranching transitioned to orchards in the early 1900s. The Okanagan Valley Land Company and the Okanagan Centre Irrigation and Power Company Ltd bought up large tracts of land in 1908 (Thomson 2016, 3). These companies developed irrigation systems on the lands purchased and began selling them as orchard lands (Thomson 2016, 3). The Wood Lake Fruitlands Company was also purchasing, subdividing, and selling orchard land at this time (Thomson 2016, 4). By

1911, hundreds of individual plots were planted to orchards (Thomson 1985, 32). Okanagan Nations and members were largely excluded from orchard agricultural activity as reserve lands were not provided with the irrigation systems required nor were the First nations given the capacity to obtain such a system.

Commercial logging in Okanagan territory started as small side enterprises for European settlers (Matheson 2006). The building of the railway facilitated the expansion of the forestry industry in the area, as it was a purchaser of timber for railway-ties. The expansion of the railway in the 1880s provided access to new markets (Canadian prairies and central Canada) prompting the establishment of timber mills along Lake Okanagan, in snqaxiʔstn, and in Kamloops as well as the expanded use of portable saw mills in the Okanagan forest interior (Geography Open Textbook Collective 2014; Matheson 2006). The 1912 *Forestry Act* established the BC Forestry Branch (later called Forestry Service) and imposed the requirement of Timber licenses and leases to cut on Crown Land. This legislative change pushed out small operators and encouraged the establishment of larger companies who could buy multiple timber leases and build stationary operations.

2.5.2 Contemporary Development Context in the Hydro Era (1930s to present)

2.5.2.1 Effects of Dams and Hydroelectric Power Development

The Columbia River system has undergone significant change within the last century, mostly due to resource extraction, impoundment and hydro development. The mainstem and most significant tributaries have been fragmented by dams functioning for flood control, irrigation and hydro-electric power production.

The development of dams both north and south of the International Boundary was literally a watershed moment for the ecology and lifeworld of the Syilx. In the 1930s, hydroelectric development and the “Hydro Era” in the Columbia basin really began in earnest with the damming of the mainstem of the Columbia and Snake rivers. The first, in 1933, was Rock Island Dam near Wenatchee. Bonneville Dam followed in 1938. Construction of dams on the Columbia and Snake rivers continued into the 1970s, with most of the development occurring between 1950 and 1970.

Rock Island Dam and Bonneville Dam were both built with adult fish passage, however, Grand Coulee was completed in 1942 without fish passage. After 1946, salmon and steelhead no longer appeared at the base of Grand Coulee Dam, trying to get upriver to spawn. The Grand Coulee dam alone was responsible for loss of 1,100 miles (1,700 kilometres) of spawning habitat for salmon and steelhead and a loss of 4 million salmon harvested by the tribes annually (the Columbia Basin Tribes and First Nations 2015, 2, 5; Ortolano & Cushing 2000, 59; Sam 2008, 50). The construction of dams on the Columbia River created an impediment that inhibited the migration of

the salmon stocks that for thousands of years faced only natural obstacles on the fast flowing Columbia and its tributaries, including the then meandering Okanagan River.

As a result of this fundamental cutting off of upstream access, salmon were extirpated from the Columbia River system, an impact that remains to this day. The loss of this critical cultural and food security species is by itself a longstanding significant adverse cumulative effect on Okanagan Nation rights.

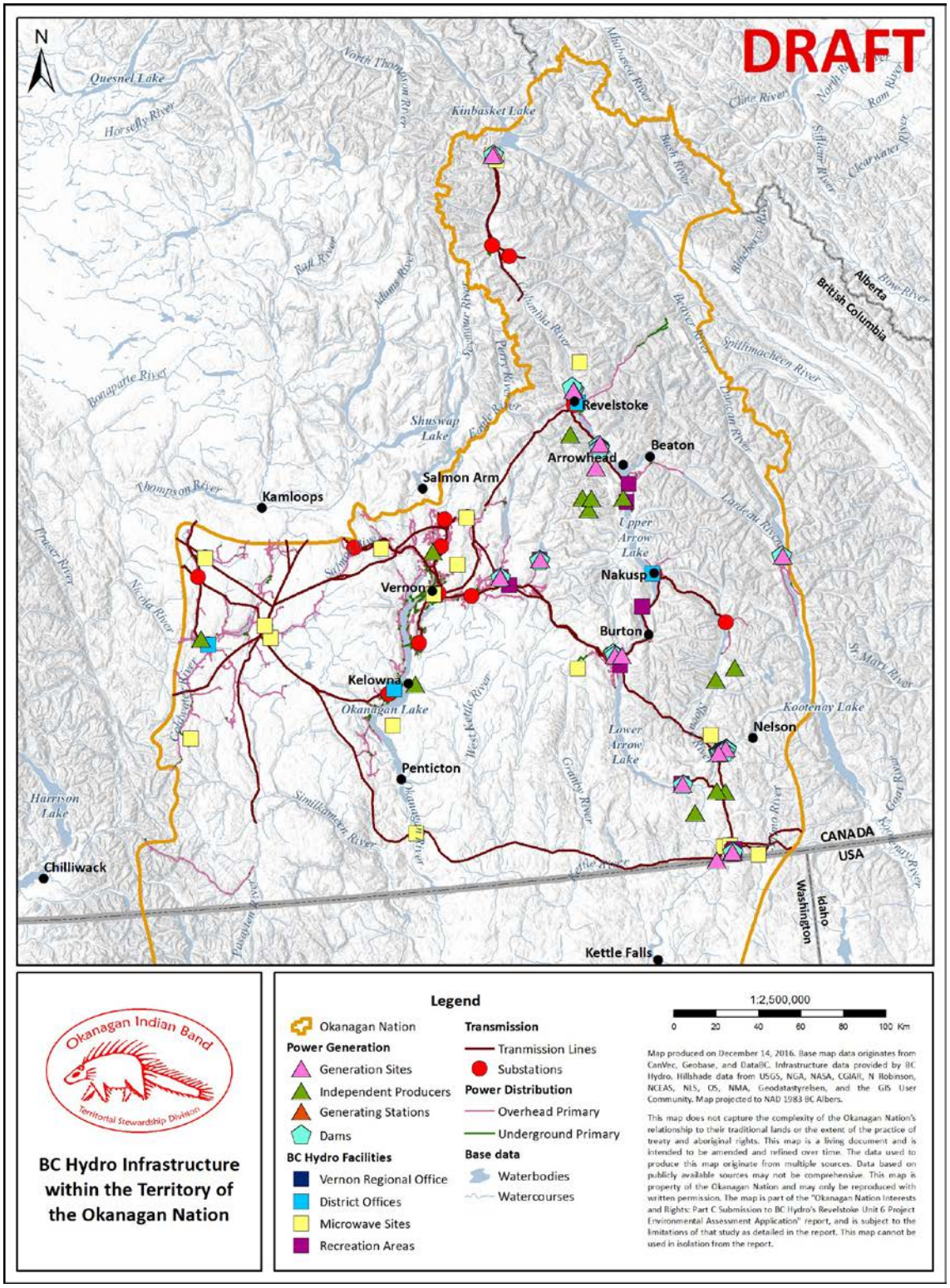
The Columbia River Treaty, ratified in 1964, saw the increase in dam construction in Canada, including Hugh Keenleyside Dam (1968) and Mica Dam (1973), both owned and operated by BC Hydro, and again further fragmenting the upper Columbia River. Damming at Hugh Keenleyside caused Upper and Lower Arrow Lakes to swell in surface area and depth, and flooding in the segment of Columbia River that used to interconnect these two lakes. Flooding of the lakes and river segment led to the removal of 126 km^2 of forested and riparian lands (Shaw et al. 2012). In total, 625 km^2 of sixth+ order river, 25km^2 of small to medium lakes, and 5.5 km^2 of shallow water habitat were lost as a result of Columbia River, tributary, and floodplain/forest land flooding (Shaw et al. 2012). Water retention flattened out seasonal flow pattern, maintaining sub-natural flow volumes, and preventing naturally returning floods. The Revelstoke Dam followed in 1984.[5]

Currently, the Arrow and Kinbasket Reservoirs occupy massive footprints at 51,270 and 42,650 ha respectively. The Revelstoke (11,450 ha), Duncan (7,300 ha) and Koocanusa (6,685 ha) reservoirs are smaller but still very large. The Whatshan (1,770 ha) and Pend d'Oreille (430 ha) are smaller still, and Kootenay Canal, Aberfeldie, Elko, Cranberry, and Spillimacheen reservoirs are less than 50 ha each.

Okanagan Nation territory is now the powerhouse of British Columbia, housing the majority of BC Hydro's power generation facilities. There are 11 hydroelectric dams, including six major dams — Mica, Revelstoke, Hugh Keenleyside, Duncan, Kootenay Canal and Seven Mile Dam — totalling 53% of BC Hydro's provincial infrastructure. Figure 2.3 identifies the locations of this BC Hydro infrastructure. Most recently, BC Hydro completed the Interior to Lower Mainland (ILM) Transmission line. The ILM project is BC Hydro's largest transmission line to be built in the last 30 years. The ILM is a 500 kilovolt transmission line that is 247 km long and runs from Vancouver to just east of Nicola and crosses Highway 5A and 97C (BC Hydro 2016). Vegetation control along transmission line right-of-ways can include mechanical control methods and/or herbicide spraying (Golder Associates 2008).

[5] Effects of the Revelstoke Dam to date are discussed further in Section 3.3 of the report.

Figure 2.3: BC Hydro Infrastructure Within the Territory of the Okanagan Nation



2.5.2.2 Other Contemporary Development Activities and Effects in Okanagan Territory

Additional cumulative effects on the Okanagan land base include contributions from forestry, transportation, mining, agriculture and residential community development.

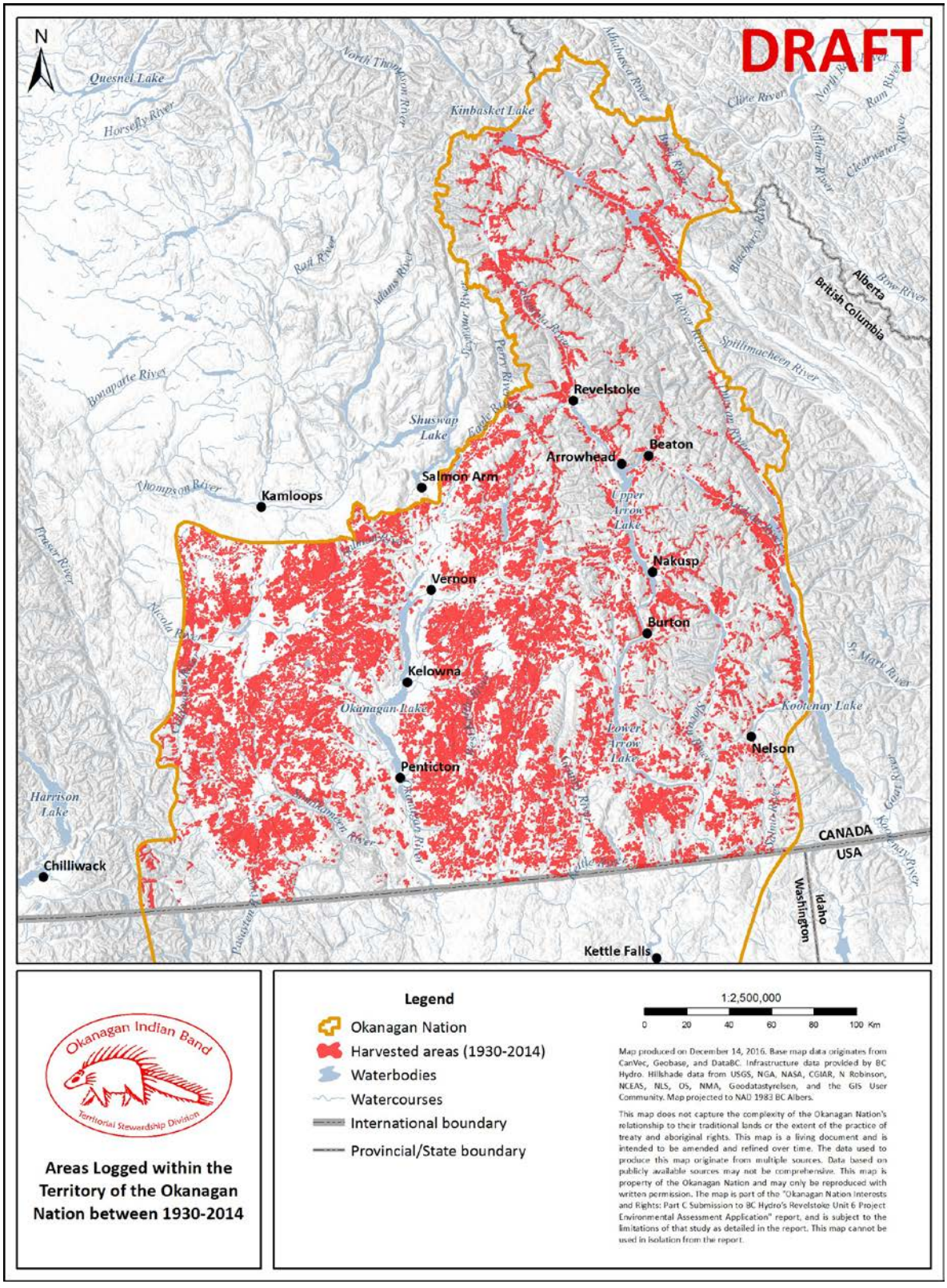
In addition to hydroelectric power generation and transmission, the current day main economic base for the Thompson-Okanagan Region[6] includes mining, forestry, agriculture, manufacturing, tourism and retirement industries (BC Major Projects 2015). Forestry, agriculture, and mining are discussed in further depth below.

Forestry and forestry products is another dominant industry in the region. Forestry accounts for 11% of the Okanagan-Shuswap district's total employment. Within the Okanagan Timber Supply Area (TSA) there is an annual allowable cut of 2,655,000 m^3/year (BC FLNRO 2016). Current forestry management practices often do not align with Okanagan values. Figure 2.4 shows areas logged between 1930 and 2014. The change over time is evident, with wide expansion of forest clearing throughout the RSA.

Logging activities replace mature trees with immature forest communities, resulting in a multitude of adverse effects on landscape ecosystem dynamics, vegetation, soil, wildlife, fish and water bodies. Cutblocks include a road network, both within and between cutblocks and processing locations, as well as decking sites so the extent of disturbance is not fully captured with the cutblock polygons alone; Figure 2.5 depicts the road network within the RSA. Additionally, forest clearing in advance of flooding the Columbia River and tributaries, as well as Upper and Lower Arrow Lakes and the small to medium size lakes was not recorded as 'cutblocks' so this expanse of forest conversion lands in not captured in the above statements about spatial extent of disturbance.

[6] Thompson-Okanagan Region is defined by the BC Major Projects Inventory and includes Okanagan territory see http://www2.gov.bc.ca/gov/content/employment-business/economic-development/industry/bc-major-projects-inventory for more information on the regions.

Figure 2.4: Areas Logged Within the Territory of the Okanagan Nation Between 1930-2014



Agriculture continues to be an important part of the economy for the region (BC Agriculture & Seafood 2016). As reported in the 2011 Census, the Thompson-Okanagan region is second to having the most farms in the province of British Columbia (COEDC 2015). Agricultural products include dairy and cattle ranching, and forage in the north (around Vernon and Enderby), and grapes, cherries, and tree-fruit crops in the central (Kelowna) and southern part of the region. Cherry production is increasing in the region due to growing demand as well as recent legislative changes in mainland China (COEDC 2015). Associated water allocations are a growing concern for the Okanagan Nations. These competing interests threaten Okanagan land and water stewardship along with food security, health, economy, and future salmon returns, a fundamental aspiration and right for the Okanagan.

Community development and associated road and electric utility development, both to support community members and the industries in the area, as well as sub-division of land, are another land use that impacts the ONA member Nations' Aboriginal rights throughout this area. Figure 2.5 depicts the road network, as well as the communities and sub-divided lands that occur within the RSA. These disturbances lead to increased habitat fragmentation, an alteration of plant and wildlife population dynamics and natural disturbance processes, as well as influences predator-prey interactions and diseases. These disturbances increase mortality effects on wildlife, both through increased hunting and predator pressure, as well as through vehicle accidents and human-wildlife interactions in more populated areas.

Mining and mineral development is an important land use in the region (see Figure 2.6). In 2015 there were 14 exploration projects documented for Thompson-Okanagan-Cariboo (BC Ministry of Energy and Mines 2016). Of particular concern to Okanagan are Ximen Mining Corporations' exploration activities in the Brown's Creek Watershed, located directly west of OKIB's main reserve lands. Fears are that mineral development activities could impact both human and animal health along with water quality and quantity.

Alternative (non-Hydro) power operation technologies are also being built in the region with the Pennask Windpower Generation Plant nearing completion. The plant is located 44 km west of Kelowna on the west side of Lake Okanagan. Upon completion, it will be a 15 Megawatt plant that will consist of five turbines (Zero Emission Energy Developments 2016). The Pennask Windpower Generation Plant was undertaken as part of the Okanagan Wind Projects, which are sponsored by InstarAGF Asset Management Inc. and are being developed through collaboration between Zero Emission Energy Developments Inc. and the Upper Nicola Band, Westbank First Nation, and the Penticton Indian Band (Okanagan Wind 2016). The location of wind tenures in the Project-affected area is shown in Figure 2.7.

Figure 2.5: Infrastructure and Land Use Within Okanagan Territory

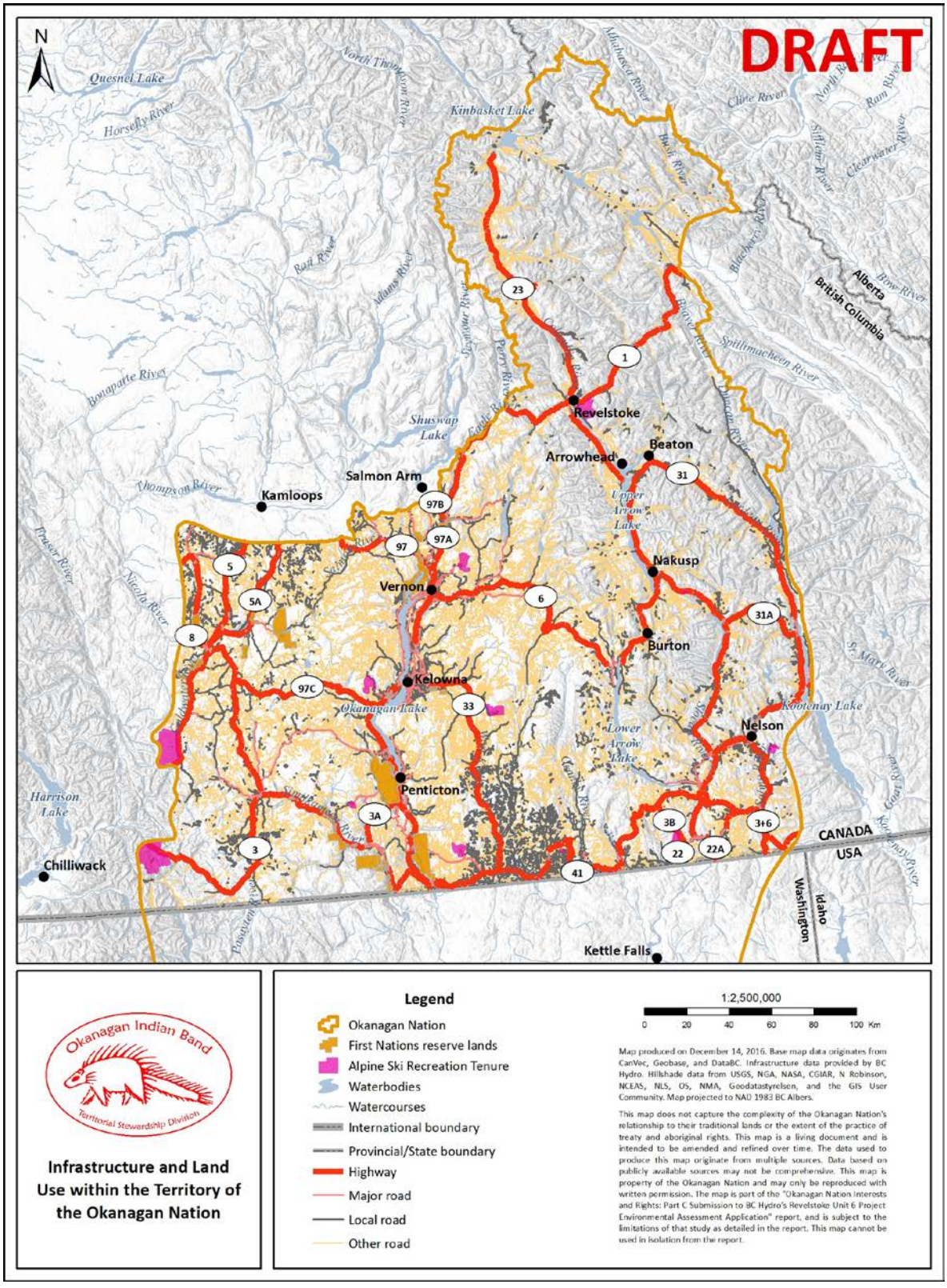


Figure 2.6: Minerals, Placer, and Coal Tenures within Okanagan Territory

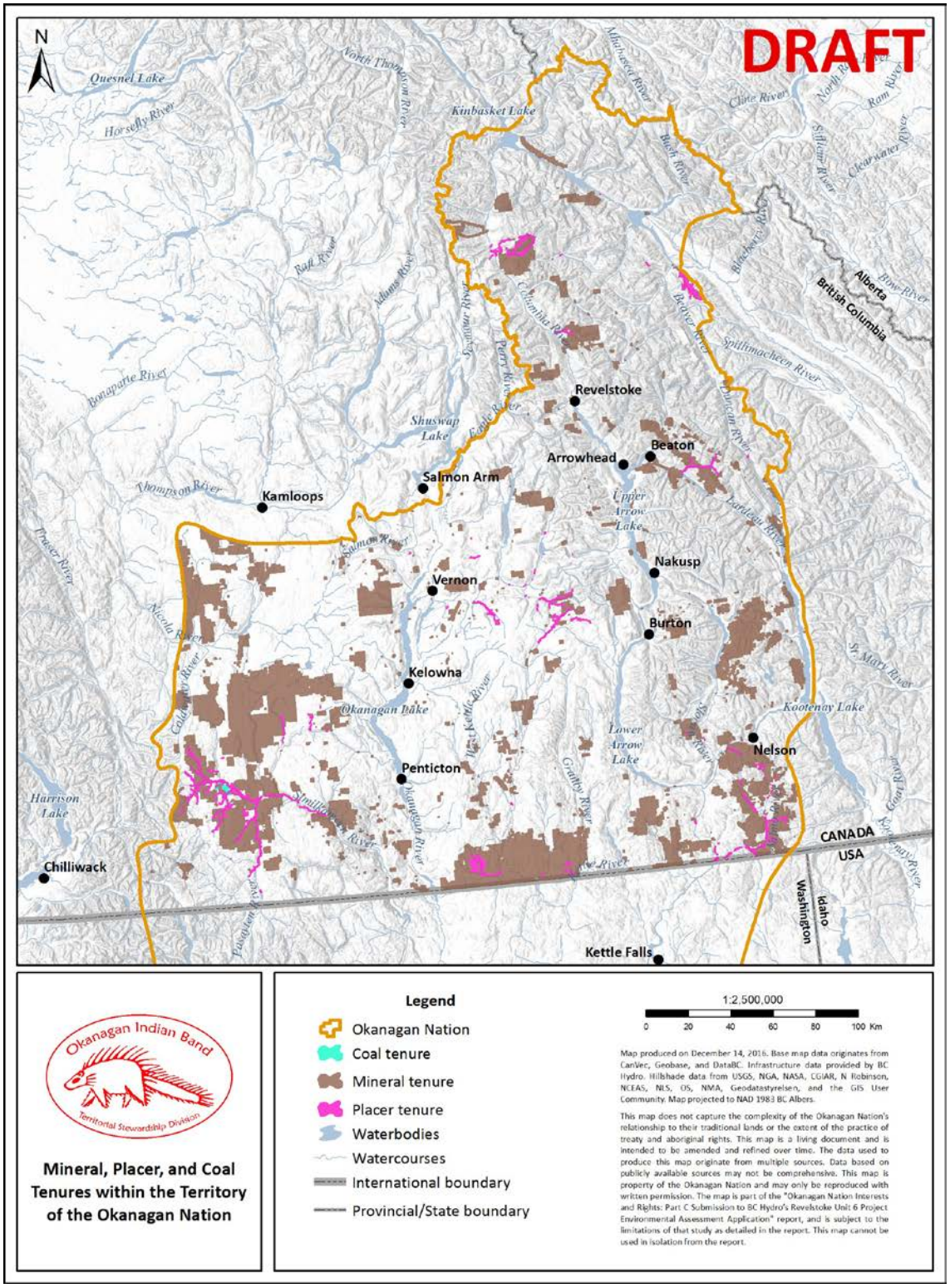
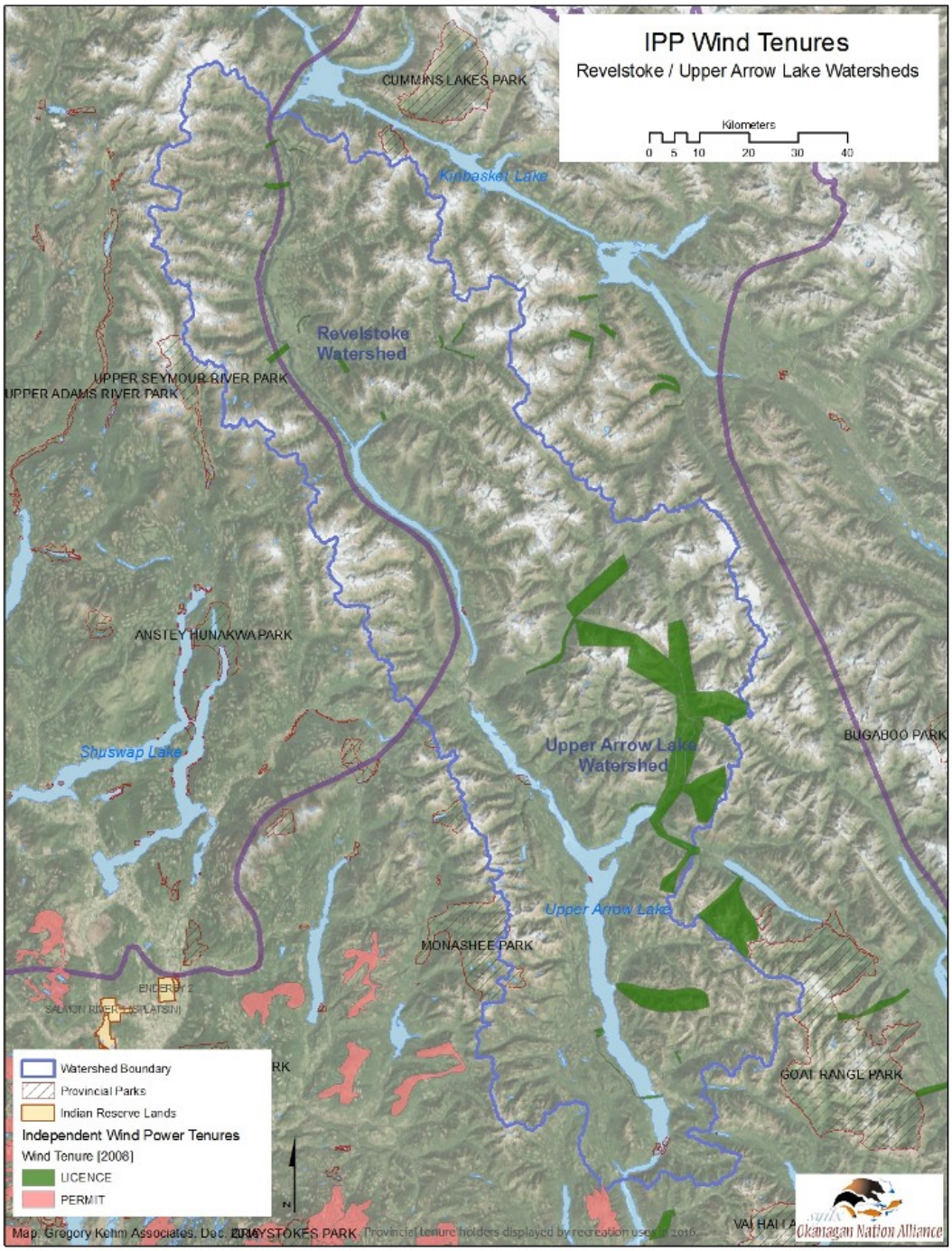


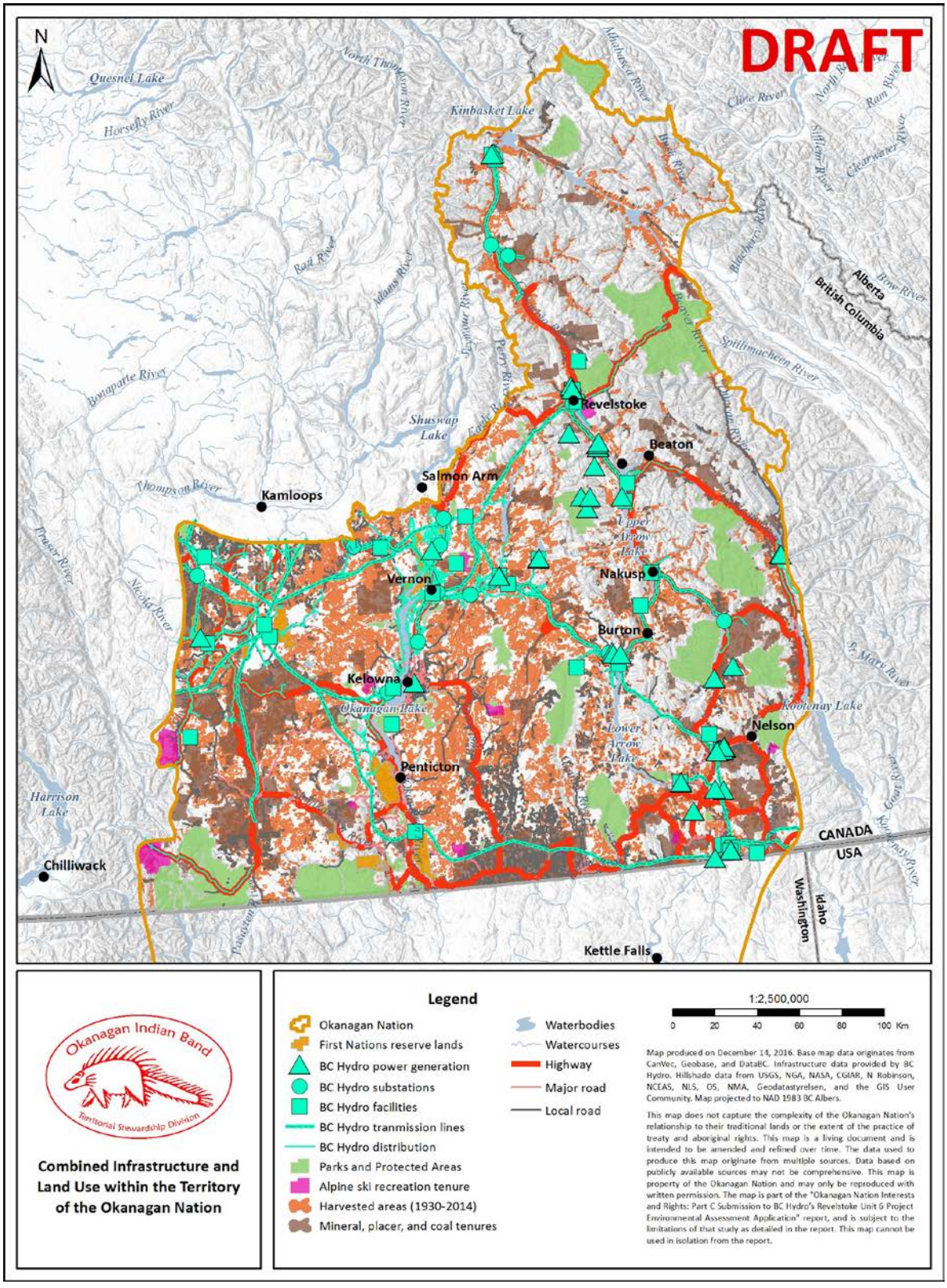
Figure 2.7: Independent Wind Power Tenures



In summary, the land and water within the Columbia River watershed in particular, and throughout Okanagan Nation territory in general, has undergone a large number of changes since the dawn of the Hydro Era in the 1930s. Most significantly the damming of the Columbia River and forest clearing, via clearing/flooding associated with the dams, and ongoing timber harvest. Other notable activities include development and expansion of Revelstoke, including subdividing the landbase in the local area; converting floodplain to agricultural use south of Revelstoke; development of the Revelstoke Mountain Resort; and development of the transportation and electric utilities network.

Figure 2.8 overlays existing infrastructure, tenures and land uses within Okanagan Territory. It shows clearly that the territory is largely disturbed and has already been impacted by industrial development and anthropogenic activities that adversely affect the land and water, resources, and environmental services relied upon by Okanagan since time immemorial.

Figure 2.8: Combined Infrastructure and Land Use Within Okanagan Territory



2.6 Consideration of Cumulative Effects to Date on the Okanagan Nation

This section examines cumulative effects overall on the Okanagan since contact; VC-specific context of cumulative effects to date is provided in Sections 4 through 8.

The past 200 years of contact followed by colonization have had adverse (negative) consequences on the ability of the Okanagan Nations and their members to flourish in what should have been a partnership of cooperation among equals. Okanagan has been constrained in many ways from exercising its indigenous customs, laws, traditions and stewardship practices over the land and waters of the Columbia and Okanagan watersheds at the core of their territory.

Evidence of substantial cumulative effects loading is all around the Okanagan people, and it is even reflected in their characterization of this period of history. There are three time periods of history the Syilx have lived through and one time period that is yet to come, as explained in the following:

1. st'elsqilxʷ (torn from the earth sqilxʷ): the first people without the natural instincts to live off the land.
2. xatmaʔ sqilxʷ (in front of us sqilxʷ): first thinking people who learned to survive from the natural laws.
3. ʔawtmaʔ sqilxʷ (to struggle and /or come after sqilxʷ), which means the people of today, after the arrival of the settlers.
4. Kʷaʔsíc (hereafter): the time that is yet to come.

The characterization of this current era, the time after the arrival of settlers, as ʔawtmaʔ sqilxʷ – "to struggle" – is telling. In many ways, colonization, settlement, urbanization and industrial development within Okanagan territory has made it challenging for Syilx people to practice their inherent laws, for example, their stɬʔtaɬt (right and responsibility) to act as caretakers for the land [7].

The level of existing development and industrial activity in the territory shown above, combined with the colonial history, illustrates that Okanagan Nation values have already been heavily impacted. Many different Crown and settler decisions and actions have led to a massive amount of change in the well-being and way of life of the Okanagan Nation since contact. These combined changes over time must be considered whenever looking at cumulative change in the vulnerability of our members and infringements of their rights and interests.

In summary, externally imposed changes mean that the members and bands of the Okanagan Nation now live in a cultural landscape that:

[7] As laid out in the *Syilx Nation Water Declaration* of 2014 (see Appendix 2).

- Has seen widespread land alienation from – and annexation of – traditional harvesting, transportation and occupation grounds, with our people forced into smaller and smaller "postage stamp" areas, tiny proportions of our traditional territory;
- Has been largely alienated from ON governance, laws and norms;
- Has seen extirpation or large-scale reduction in the distribution, abundance and population health of multiple wildlife and plant species (most notably salmon and caribou, critical harvested species);
- Has been subject to multiple regulatory constraints on the ability to harvest;
- Has been forced to adapt to so many landscape, cultural, socio-economic, political, educational, and other changes that their cultural resilience and way of life has been heavily infringed upon; and
- Has seen reduced mobility on land and water for ON members, among many other changes.

Okanagan have also been subject to many experiences with BC Hydro and other developers, and the federal and provincial Crowns, that have fundamentally altered the Okanagan way of life and which have been contrary to Okanagan laws and norms. As outlined in the Captikʷɬ story – The River People, Coyote and Salmon, as told by Caqcaqalxqn:

> [*When] the dams happened[,] [e]ach flood pool behind each dam devastated the land and buried the land forms and the laws beneath sediment and soil. The flooding water drown the Syilx foot prints and homes. Their voices got eroded and erased too, by whirl pools of water, back eddies and the raging river as it is caused to artificially rise and fall from the dams operations. At the same time, in its wake, are the exposed ancient remains of Syilx and siʔxʷepmx people. Also as a result, we no longer are able to see, at the great Kettle Falls, where coyote had sat with his three-pronged harpoon (see Preamble, p.11)*

This cumulative effect context has left the Okanagan in an impoverished social, economical, cultural and political position in our own territory. It has also left us wary of both existing and any additional cumulative effects loading, including the following:

- Impacts on water, watersheds and water crossings, including wetlands, drainages, groundwater, drinking water, and everything that relies upon those watersheds, such as fish, wildlife, birds, deer, moose (i.e., changes in the abundance, distribution and population health of these critical species);
- Continuation and exacerbation of change from a natural ecological flow regime with one managed by humans, contrary to Syilx laws, norms and guiding principles;
- Disturbance/losses to *Syilx* way of life, including:
    - ongoing cultural and spiritual losses;
    - loss of access to land and resources;

    - impacts to fishing, hunting, food gathering,
    - loss of indigenous economy, for example through reduced harvesting success; and
    - impacts to *Syilx* management of lands and resources for present and future generations;

- Disturbance and/or loss of lands, food and medicinal plants from road building, introduction of non-native invasive weeds and use of herbicides adjacent to reservoir, roads and construction sites;
- Increased opening of *Syilx* Territory to recreational use, including lack of respect and protocol shown for land, water, resources and cultural/spiritual sites;
- Increased risk of industrial accidents, including appropriate mechanisms for avoidance, mitigation, and compensation for impacts; and liability and responsibility for damages and ecosystem recovery;
- Long term effects of building and operating hydro generating stations;
- Cumulative impacts of on-going development in *Syilx* Territory, including such things as impacts to physical, emotional, mental and spiritual well-being and ecological impacts including from mountain pine beetle and climate change; and
- Infringements to s.35 Rights, including *Syilx* Title and Rights.

It is in this context of existing vulnerability that any additional development, including the proposed Rev6 Project, must be assessed.

2.7 Okanagan Efforts at Renewal and Recovery

Although colonization brought harm and great challenges to the Syilx/Okanagan, we have survived and today continue to strengthen our culture and protect our land (ONA 2010e). It is worth recalling that there is a fourth time period in the Syilx worldview – the Kʷaʔsíc or time yet to come. The Syilx are seeking renewed control and governance to make the time to come less of a struggle than the current era, and more in line with “those who learned to survive with the natural laws” in the second era of Syilx time.

In 1987, the Chiefs and Councils of the Okanagan Nation signed the *Okanagan Declaration* which reaffirmed their commitment to uphold the fundamental Okanagan principles and values contained within the Declaration and continue to work towards being a strong, unified Nation and Government in the best interests of their members. Under the *Declaration*, the Syilx people declare that:

> *We are the unconquered aboriginal peoples of this land our mother; The creator has given us our mother, to enjoy, to manage and to protect; We the first*

inhabitants, have lived with our mother from time immemorial; Our Okanagan Governments have allowed us to share equally in the resources of our mother; We have never given up our rights to our mother, our mother's resources, our governments, our religion; We will survive and continue to govern our mother and her resources for the good of all for all time. (Okanagan Nation Declaration 2014)

2.7.1 Contemporary Elected and Customary Governance Mechanisms

Today, the Okanagan Nation bands follow a band council governance system. For example, the Okanagan Indian Band presently follows *Indian Act* requirements for their elected political governing structure. Elections take place every two years and are held in April (OKIB 2016b). Okanagan Indian Band Leadership is comprised of one Chief and ten Councillors.

Despite changes, today's governance model and governors are both closely aligned with historic Syilx values. The process of cooperation and consensus decision-making symbolized in the Four Food Chiefs captikʷɬ continues to guide their ethics, protocols, order and life lessons of the Syilx way of life and culture. In their deliberations Chief Skimxist (Black Bear), Chief spitƛ'm (Bitteroot), Chief Ntitx (Spring Salmon), and Chief Siya (Saskatoon Berry) reflected how the Syilx trust in each other, collaborate with each other, by including all interests, share with each other, act as stewards of our land and resources, and preserve Syilx well-being and the bounty of Syilx Title for past, present, and future generations. The Syilx Peoples work cooperatively with respect to land and resource decision-making in Syilx Territory, including identification of common principles and standards.

No treaty has been negotiated for the Okanagan Indian band. The Okanagan Nation Alliance represents OKIB in treaty negotiations. As of 2014 the ONA has not filed a statement of claim to commence or chosen to participate in the BC Treaty Commission process as ONA does not believe their members' Aboriginal Rights and Title claims would be adequately resolved given the mandate of the federal and provincial governments (*Okanagan Nation Alliance v. Province of British Columbia 2014*).

Okanagan governance, pertaining to both resources and people, remains centered on the environment and its perpetuation for future generations (this concept is generally known as stewardship).

The personal and collective responsibility of the Okanagan to the environment also remains based on a deep spiritual connection. For instance, the importance of water and responsibility for siwɬkw (water) is captured in the words of the Syilx National Siwɬkw Declaration (2014, 4-5):

Syilx Peoples have a deep intrinsic and spiritual relationship with our relative *siwłkw. Maintaining the integrity of* *siwłkw* *and respecting its relationship to all life is essential to our identity as Syilx People and is entrenched in our responsibility to our homelands.*

Through the guidance of k’ʷl’əncutn *[Creator] we accept our sacred trust to protect our* *siwłkw* *and fully express our Peoples jurisdictional authority and responsibilities to protect and respect our relative* *siwłkw. We stand united and will apply and implement our Syilx knowledge, Syilx laws, Syilx customs and Syilx self-determination to preserve, conserve and protect life’s most sacred gift –* *siwłkw.*

3. Situating the Proposed Project in the Okanagan Cultural Landscape

This section is provided without prejudice to a variety of information gaps in the draft Part A and (more particularly) Part B EAC Application materials provided by BC Hydro to the Okanagan Nations as of the date of this draft (identified under separate cover). Okanagan reserves the right to update its understanding of the Project, as well as impact pathways of the Project on our rights and interests, when updated information is provided.

3.1 Key Aspects of the Project Description

Information in this section is all based on BC Hydro-provided information.

The Revelstoke Dam and Generating Station is located on the Columbia River, five kilometers upstream from the City of Revelstoke. The dam is part of BC Hydro's Columbia River hydroelectric system, with Mica Dam and Kinbasket Reservoir located upstream, and Keenleyside Dam and Arrow Lakes Reservoir situated downstream.

Originally constructed between 1977 and 1984, the Revelstoke Dam and Generating Station was designed to hold six generating units, but only four units were installed when the facility was constructed. The fifth generating unit was added more recently and began service in 2010. BC Hydro is now proposing to add a sixth and final generating unit.

The Revelstoke Dam facilities currently include a large concrete gravity dam at the generating station, an adjacent earth fill embankment dam along the west side of the reservoir, a gated spillway, penstocks, a power plant, and a switchgear building. The current infrastructure produces about 2,480 megawatts (MW), which represents approximately 23% of the installed capacity of BC Hydro's Heritage infrastructure. Revelstoke Unit 6 would add approximately 500 MW of capacity to BC Hydro's system.

The existing water license of 90,000 cubic feet per second (cfs) was originally intended to provide water diversion flows for all six units. However, the sixth generator will be larger than the existing generators, allowing the dam to utilize a higher flow of 93,000 cfs. BC Hydro is applying for an additional water license of 3,000 cfs from the provincial government.

In order to accommodate the additional generation capacity that Rev6 would introduce to the transmission infrastructure, a new capacitor station will need to be built. The proposed location is

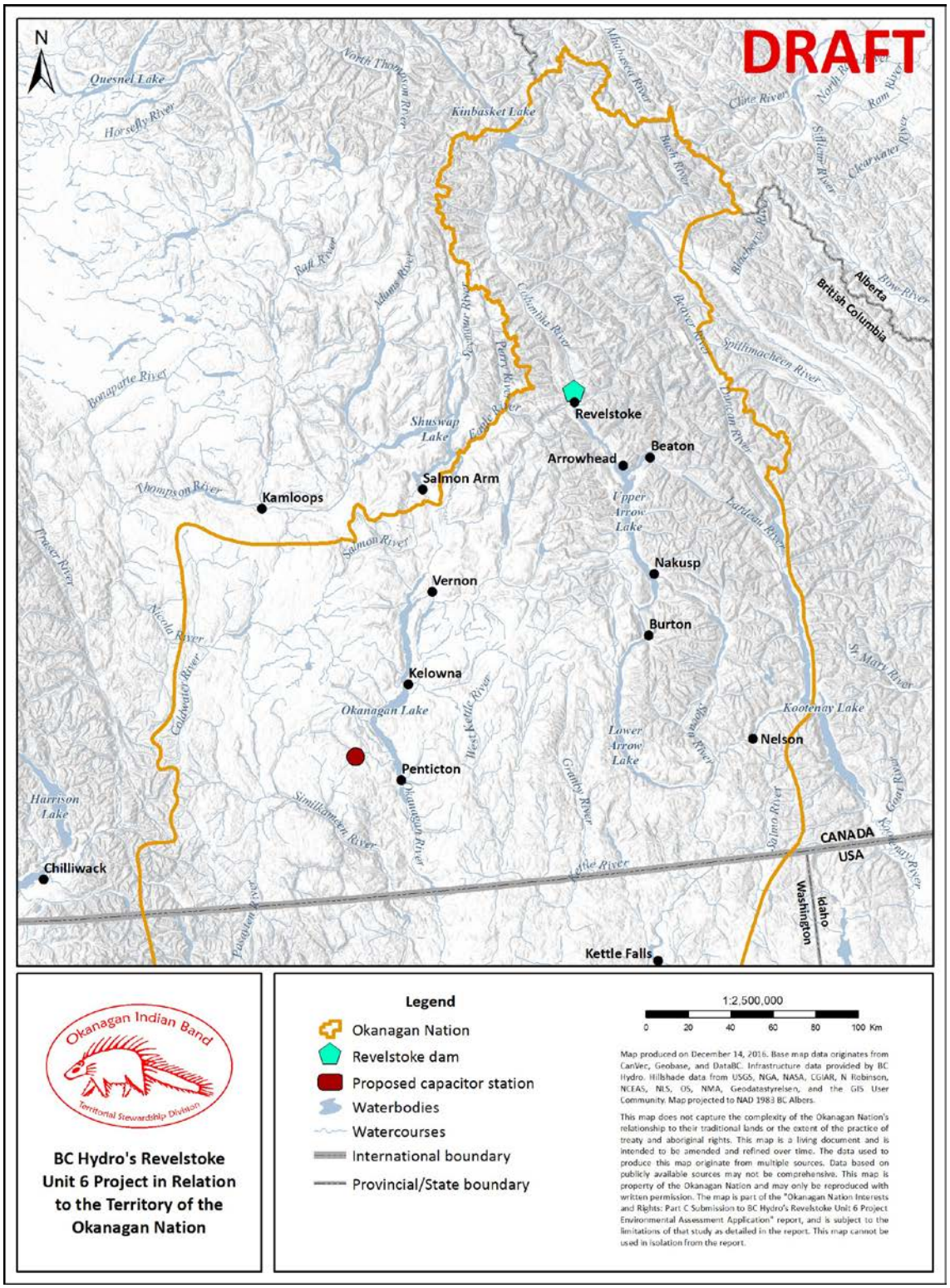
between the Vaseux Lake Terminal Station and the Nicola Substation, near Summerland. This Summerland Capacitor Station, as it is referred to in this report, would not be needed if it were not for Rev6.

The on-site construction of the sixth unit is estimated to take approximately 40 months. In addition, the installation of the Summerland Capacitor Station and an upgrade to the Nicola Substation would both need to take place, requiring about 18 months of construction. It is expected that 472 person years of employment will be created during the construction phase of the proposed project. Total project costs are estimated at $420 million.

Construction is currently scheduled to commence in 2018, with an in-service date of October 2021. The sixth unit and the capacitor station have a 70-year operating lifespan. Plans for decommissioning are not being developed at this time, and BC Hydro has indicated that the Revelstoke Dam is effectively a permanent structure.

The location of both primary components of the Rev6 Project is identified in Figure 3.1.

Figure 3.1: Okanagan Nation Territory, the Revelstoke Dam and the Proposed Capacitor Station



3.2 The Project in the Okanagan Nation's Cultural Landscape

This section provides a brief overview of the Okanagan Nation's historic use and values in the two key Project-affected areas: the Summerland Capacitor Station (SCS) location, and the Revelstoke, Mid Columbia River (MCR) and Upper Arrow Lakes area.

It is critical to recognize that time constraints on Okanagan Nation did not permit collection of more site-specific data to date and therefore this must be treated a partial account only at this stage – more information needs to be gathered to characterize site-specific values in both LSAs.

3.2.1 Use and Values in the Summerland Capacitor Station Area

The proposed Summerland Capacitor Station is the smaller portion of the proposed Rev6 Project. It would be located within the PIB's Area of Responsibility, within an important cultural use area near the location now known as Summerland. It is proposed for an area adjacent to Okanagan places known as kəɬpəlmapqən, tʼəkʷtɨkʷaʔt and sqʔəpqʔapinaʔ/kɬxʷəsink, and approximately 14km west of ackɬtpus. This area "is known as a freezer or supermarket due to the abundance and variety of sources for spiritual, ceremonial medicinal and food sources" (from Appendix 3).

The location values, use, and effects of the proposed Summerland Capacitor Station are highlighted in further detail in PIB's report on this location, which is provided as Appendix 3 to this report. Impacts identified by PIB from this proposed Rev6 Project component included, but are not limited to:

- Reduced cultural transmission practices in the area, including avoidance of this area for vision quests;
- Alteration of travel corridors (for Okanagan harvesters and wildlife);
- Reduced Okanagan harvesting in the area; and
- Disturbance of wildlife during construction and operations.

Where these or other impacts at this location are likely to impact upon Okanagan VCs, they are examined in further detail in Sections 4-8 of this report.

3.2.2 Use and Values in the Revelstoke, Middle Columbia River and Arrow Lakes Area

The Okanagan name for the Columbia River is Nxwntkwitkw. Use and occupation of the Columbia River by the Okanagan, including the snkxykntn (Revelstoke) area, is well established in oral histories, and has been the reality since time immemorial (ONA 2006). Syilx occupation of this area

(perhaps stretching over 10,000 years) is confirmed by oral histories and archaeological and ethnographic research (Sam 2008; Sam 2013; Linenberger 1998). Franz Boas' linguistic map of BC, published in 1891, delineates the Okanagan "as a line crossing the Columbia River in the vicinity of Beaver mouth which is about 110 km upriver from Boat Encampment and approximately 40 km downriver from Golden… extend[ing] from here south along the summit of the Rockies, in the east, and in the west along the summit of the mountains which extend north and south along the eastern side of the Arrow Lakes" (BC Transmission Corporation 2010, 63).

> *The eastern portion of the* Nsyilxən *territory continues to be an area of social, historic and economic significance to the* Nsyilxən *people. It is an area used for gathering, harvesting, trading, hunting, fishing and festivities. The lakes, rivers and valleys in this area provide transportation routes that allow people to come from all directions to convene in and around the Columbia River area. (ONA 2006, 7-8)*[8]

A Columbia River Captikʷɬ *story* translated from Okanagan Syilx speakers demonstrates this connection. This Columbia River Captikʷɬ *story* was shared expressly for the purposes of this EA, following a research trip to Revelstoke Dam and surrounding area with Okanagan language speakers who have specialized knowledge of the area.[1] The Captikʷɬ story is "The River People, Coyote and Salmon", as told by Caqcaqalxqn and is presented in the Preamble to this Report. It tells of how the Ntytyix, "Chinook Salmon", was known as chief of the water kingdom, to govern and keep the Syilx people in balance, through stories and laws governing the land. In this water kingdom, human beings practiced Inter-nation Governance, Land Laws, and laws of the great Rivers.

These laws apply to the Arrow Lakes, notably Land and Water Stewardship and Nation-to-Nation Relationships and Protocols. These laws are fundamental and honored the balance brought by Chief Ntytyix and honored the sacredness of water. Coyote Stories include landforms that bring physical evidence of the fact that the land, water, and animals governed all people. Such landforms functioned to bring unwavering acceptance of these laws. Coyote created many landforms across Okanagan lands, including in the area of Arrow Lakes. At great Kettle Falls is where coyote sat with his three-pronged harpoon that he used with one great thrust to bring the salmon ceremony and protocols to shore.

These landforms, and the journeys and stories tied to them, help keep the land laws and histories alive and, thus, the identity of the Syilx people as tied to land and water, to the salmon that moved through the waters of Kettle River, North and South Thompson Rivers, the Fraser River, and the Columbia River. Living along the shores of Arrow Lakes and maintaining ceremony, then, enabled balance. These ceremonies take place at Kettle Falls, Castlegar, Revelstoke, and Okanagan Falls.

[8] Where this report speaks of the Nsyilxən people (Salish-speaking), this refers to the language spoken by Okanagan (Syilx) people, and is therefore synonymous with Okanagan.

Archaeological evidence around the Arrow Lakes, in addition, demonstrates not only a prolonged occupation by the Okanagan (at least prior to 1870) and their related ancestors, but as a prominent area for economic, subsistence, social, and cultural activities (Okanagan Nation Alliance 2003, 9). Indeed, the Arrow Lakes are reportedly named for the presence of arrowheads left as a custom by the Indigenous populations that travelled the lakes by canoe (Ministry of Attorney General Legal Services Branch 2012, 45).

Contemporary Okanagan members have established ties to the “Lakes” cultural group (both of the Interior Salish group) that are recognized as having a long tenure around the Arrow Lakes (Ministry of Attorney General Legal Services Branch 2012; Laforet 2015). The Okanagan are genetic and linguistic relatives (speaking different dialects of Nsyilxən) to the Lakes (Ministry of Attorney General Legal Services Branch 2012). These links between the Okanagan and Lakes further confirm the longstanding and deep ties of the Okanagan to the Arrow Lakes region.

As recorded by the Ministry of Attorney General Legal Services Branch (2012), in 1901, an Indian Agent visited the Arrow Lakes and found among the families living there, some Okanagan (as well as Kootenay and Shuswap). Okanagan people were settled near Burton City, making their livelihoods from the land through hunting, trapping, and fishing, as well as working on steamers on the Columbia River, for which reserve was allotted nearby Burton in 1902 (Ministry of Attorney General Legal Services Branch 2012).

The Okanagan relied heavily on the resources available around the Arrow Lakes and wider region, including terrestrial and aquatic animals (especially salmon). Numerous plants, lichen, fungi, and mosses were also harvested for subsistence uses and the manufacture of goods, as well medicines and ceremonies, such as those for purification (Turner et al. 1980, 153). The Arrow Lakes area were also rich grounds for hunting caribou, bear, and deer among other species, a year-round and near constant activity (Teit 1930).

The Okanagan way, being indelibly land and water based, necessitated travel to access seasonal resources, such as to bison grounds (Kennedy and Bouchard 1998), by using snowshoes in the winter, and by dugout canoes and rafts over water (Teit 1930; Johnson 1964, 171). In general, travel was highest outside the winter months and even extended to other territories (Okanagan Nation Alliance 1999, 25)

The ability to travel across the territory was, furthermore, a required component of managing the land for its resources, and was based on specialized knowledge gained, in part, through that travel:

> *The caribou swam across the river and up ... our people came over from Beaverdel an over to Carmi over to the Kettle Valley and from the Kettle Valley over to the Christian Valley from the Christian Valley over into the Granby right over to Edgewood and they would wait there. They know when that caribou is going to swim cross. They would wait*

there and our people would ... the caribou would get in the lake; cross the lake ... they know right where they are going to come ashore. They pick out a few. That was part of the management. (personal communication, field visit to Big Eddy archaeology site, August 18, 2015)

The Okanagan continue in the present day to occupy, use, and navigate through this eastern portion of Nsyilxən territory (see Figure 3.1), maintaining a connection to the Revelstoke, the Mid-Columbia River, and linked Arrow Lakes area. The area remains a critical part of Okanagan culture, identity, and language. See Appendix 1 for information on a preliminary field trip for data collection in relation to the Project in 2014. The research completed as part of this field trip is desired to be the foundation of a broader research program that will serve as the backbone to the development of an Okanagan-inclusive monitoring and management plan that will span the lifetime of the regulated hydrological regime that is the Columbia River in BC, and its surrounding terrestrial environment, critical portions of Okanagan territory since time immemorial.

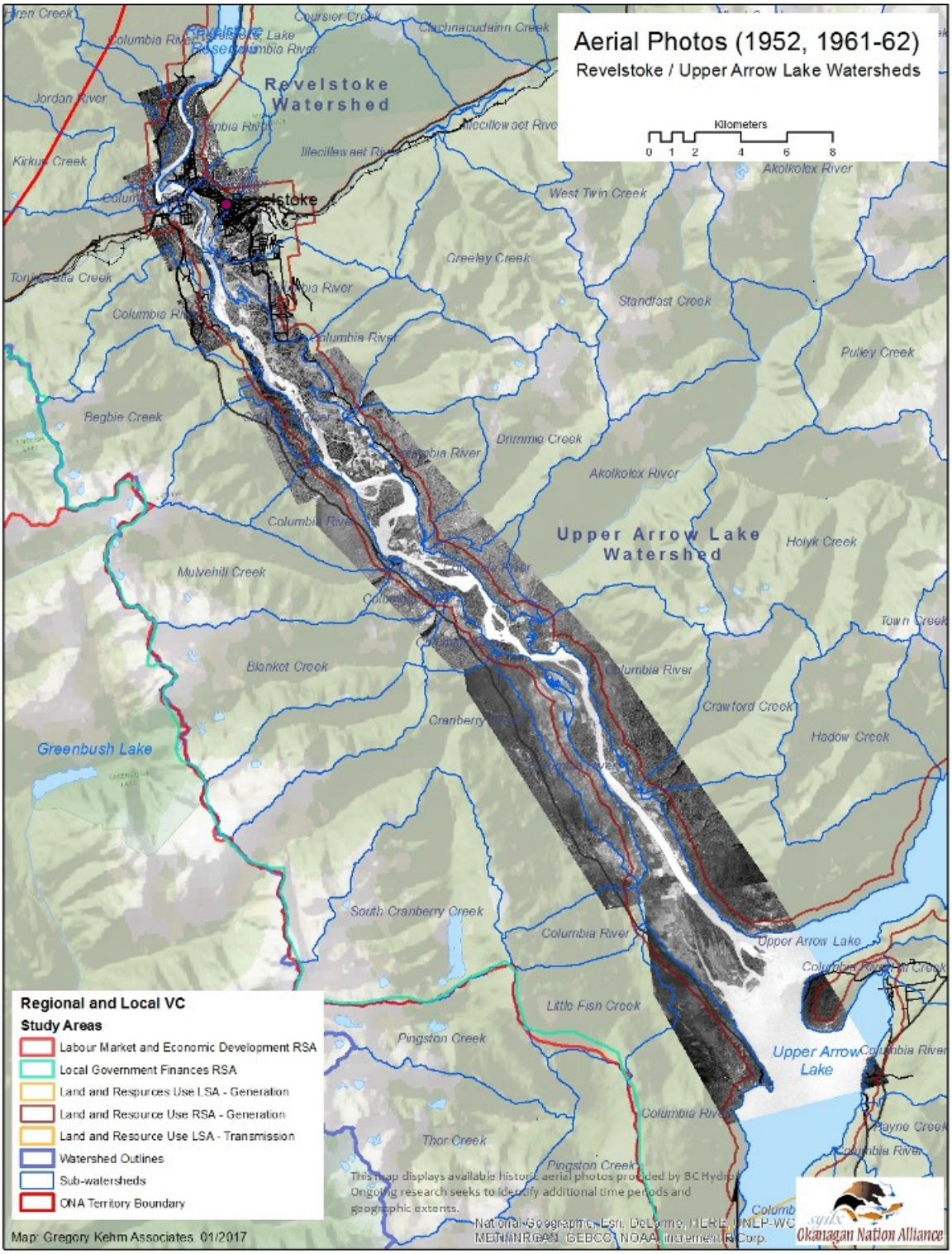
The Rev6 Project is thus clearly situated within the Okanagan's physical and cultural landscape. Okanagan people relied on this part of the territory for sustenance, trade, transportation and livelihoods and continue to access the area and practice rights regularly. The changes to the landscape associated with the Revelstoke Dam have constrained the Okanagan Nation members' ability to uphold traditional laws of balance and respect for the land, as discussed in the next section, but these infringements have not reduced the desire and right to use this part of the Okanagan cultural landscape.

3.3 Effects of the Original Revelstoke Dam

As noted in Section 2, the Columbia River system has been extensively altered by dams built for flood control and hydro-electric power production. At the time of dam construction, there were not a lot of assessments of water, fish, wildlife, and Syilx use to fully assess the significance of potential impacts to ecosystems and species, particularly poorly understood species. In the absence of quantitative baseline data, we are forced to piece together the implications of changes over time, but by any measure they have been dire. The Revelstoke Dam, an expansion of which is the subject of this assessment, is a good example.

The pre-dam ecosystem (see air photo re-creating the pre-dam ecosystem below) was dominated by forested ecosystems, large river systems with associated floodplain wetlands and deciduous forest, and varying lengths of river and/or stream ecosystems. According to studies by Ketcheson et al. (2005), Moody et al. (2007), and Utzig and Holt (2008), there was 11,451.4 ha of pre-dam aquatic and terrestrial ecosystems (rivers, streams, shallow pools, gravel bars, wetlands,

Figure 3.2: Aerial Photo Re-construction of the Pre-dam Ecosystem



cottonwood forests, floodplains, and upland ecosystems inundated by the Revelstoke Reservoir, based on full pool reservoir elevation.

Since construction of the Revelstoke Dam, much has changed. The construction and operation of the Revelstoke Dam has, and continues to, severely affect Okanagan aboriginal rights and title. The Revelstoke Dam is built on Okanagan Nation title lands. The Revelstoke reservoir floods Okanagan Nation title lands.

The operation of the Revelstoke Dam has severely affected the exercise of Okanagan aboriginal rights above and below the dam. Below the dam, the waters flowing on the rivers have been adversely affected, as described below, seriously and detrimentally affecting fish, animals, birds, plants and riparian habitat.

Above the dam, the river has been turned into a hydroelectric reservoir operated to maximize hydroelectric generation. The flooding of the Revelstoke Valley by the Revelstoke Dam has harmed and transformed the local ecosystem and impaired the exercise of Okanagan aboriginal rights in the area. Key adverse impacts associated with the operation of the Revelstoke Dam include but are not limited to:

- Blockage of the river passage way and associated adverse effects on fish stocks (including salmon, bull trout, rainbow trout, and white sturgeon) and habitat;
- Changes in downstream water flows which negatively affect oxygen levels and total gas pressure and associated adverse effects on fish;
- Associated changes in the distribution, abundance and health of key fish species in the Project-affected area;
- Changes to flows of sediments and nutrients which creates adverse effects on fish spawning and habitat areas, including the loss of as much as 30% of spawning areas downstream of the dam in the Arrow Lakes for some species;
- Flooding of land above the dam with associated adverse effects on habitat, water flows and Aboriginal title;
- Interference with traditional hunting and plant harvesting areas, including reduction in likelihood of harvesting success in the Project area;
- Changes in channel morphology and erosion patterns in the Mid-Columbia River;
- Increased risk to physical heritage resources upstream and downstream of the dam;
- Even greater shift from a natural flow regime to a human controlled one, contrary to Syilx values; and
- Interference with spiritual beliefs and practices associated with the water and its free movement, among other impacts.

3.4 Potential Rev6 Project Impact Pathways on Okanagan VCs

The Revelstoke 6 Project and associated Summerland Capacitor Station are expected to have a number of impacts across Okanagan Nation VCs, on top of existing cumulative effects, including from the original Revelstoke Dam. These impact pathways are identified in Sections 4 through 8 as they relate to each of the Okanagan-identified VCs.

4. siwłkʷ (Water)

4.1 Introduction

Water is life.

Water is our relation.

Water bonds us to our ancestry, our descendants and our land.

July 31, 2014

ONA Annual General Assembly, Spaxomin, BC

Water (siwłkʷ in the Okanagan language) – its quantity, quality, form and pattern – helps to define the identity of Okanagan Nation peoples. As a result, human-induced changes to water can have – and have had, primarily since the 1930's with the start of regulating flow of the Columbia River system, starting on the mainstem of the Columbia River in the United States and expanding in the late 1960s into Canadian damming projects – an impact on Okanagan identity, relationship with nature, and ability to adhere to natural laws.

This section focuses on cumulative effects to date and potential Project-specific effects pathways on Okanagan siwłkʷ values in the Columbia River system. As per Syilx holistic assessment requirements, there is strong emphasis in this VC-specific assessment on establishing cumulative effect loading to date rather than merely considering the incremental changes caused by the Rev6 Project. In relation to water, the strong contribution of BC Hydro to changes in water values since the late 1960s makes this careful consideration of legacy impacts all the more necessary.

A full consideration of Project-specific effects and total cumulative effects in the Project Case cannot be completed until: a. BC Hydro fills information gaps in the assessment materials it has provided Okanagan to date; and b. the parties meet regarding mitigation requirements.

4.2 Setting the Context: Siwɬkʷ and Syilx Relations

There are numerous water systems throughout the more than 69,000 square kilometers of *Syilx* Territory. These systems include: rivers, wetlands, lakes, streams and aquifers, springs, marshes and what have now become reservoirs. There are over 27 different watersheds and hundreds of sub-basins within *Syilx* Territory, each with their own personality, needs and ways of being. These characteristics are emblematic of the fact that water is not considered a resource by the Syilx but a relation meriting respect, and anthropocentric change to which is almost always prohibited by natural laws.

A place-based stewardship approach has been utilized for many thousands of years to ensure that those with the most knowledge and understanding of siwɬkʷ within a specific region of the Okanagan Territory are responsible for ensuring that proper measures of respect are carried forward. Armstrong and Hall (2007) describe *Syilx* people and their waters:

> *that were very closely interconnected in terms of the different kinds of habitat that they resided in and the unique aspects that provided food and sustenance in those different areas of the Syilx territory. Most of it around the river systems: the Sanpoil River, and the Methow River, the Similkameen River, of course, the Okanagan River, the Kettle River, the Grandby River, and the Arrow Lakes system. Those are all parts of our territory.*

The use and occupancy of the Interior Plateau region by the *Syilx* revolved around the water systems. The Syilx people used waterways, including the mighty Columbia River and its tributaries, as a mode of transportation and communication that was vital for economic and social relationships, and subsistence.

Water has sustained the *Syilx* for countless generations; it is a fundamental element of their cultural and spiritual identity. Water is sacred. Water is life.

4.2.1 Water Values, Laws and Norms

Water was selected as a Valued Component (VC) due to its overarching importance on many aspects of the Okanagan Nation. Table 4.1 identifies key indicators linked to Okanagan Water values, laws and guiding principles.

Table 4.1: Key Indicators of Water Values of the Okanagan People

Okanagan Valued Component	Key Indicators
siwɬkʷ (Water)	• Access to clean water for people, plants and animals • Syilx water stewardship • Water quality • Water quantity • Healthy ecosystems to support both aquatic and terrestrial plants and animals • Accessible, undisturbed shoreline • The ability to navigate and move freely in waterways for transportation purposes • Enjoyment of natural, undisturbed waterways in the territory • The free movement of water and all the life within it • Pristine Columbia River

Okanagan water values, laws and guiding principles have been articulated in the *Syilx Nation Siwɬkʷ Declaration* of 2014 (included as Appendix 2 to this report). They include but are not limited to the follow fundamental concepts that guide Okanagan decisions related to water:

- siwɬkʷ is a familial entity, a relation, and a being with a sprit who provides life for all living things and must be treated with honour, reverence, respect and reciprocity.
- siwɬkʷ is not a resource or a commodity.
- siwɬkʷ is a part of us and a part of all life; it is the lynchpin of living in balance with the natural world and adherence to natural laws.
- siwɬkʷ is the lifeblood of our tmxwulaxw and our timixw and we as Syilx People recognize siwɬkʷ as a sacred entity and relative that connects all life. siwɬkʷ comes in many forms and all are needed for the health of tmxwulaxw and for the timixw.
- siwɬkʷ is our most sacred medicine: siwɬkʷ nourishes, replenishes, cleanses, and heals.
- siwɬkʷ comes from the sky and the highest places yet it never willfully rises above anything. It will always take the lowest path in its humility, yet of all the elements, it is the most powerful.
- Our sacred siwɬkʷ teaches us that we have great strength to transform even the tallest mountain while being gentle, soft, and flexible.
- siwɬkʷ will always find a way around obstructions: under, over and through. It teaches us that anything is possible.

Overall, for the Okanagan, siwłkʷ movements, pathways, resiliency and power teach us who we are and who we can be as people:

> *Syilx Peoples have a deep intrinsic and spiritual relationship with our relative siwłkw. Maintaining the integrity of siwłkw and respecting its relationship to all life is essential to our identity as Syilx People and is entrenched in our responsibility to our homelands. (Syilx Nation Siwłkw Declaration, 2014 p.4)*

Relevant Okanagan goals and aspirations related to water include improvement over recent conditions in the way water is managed within Syilx territory and ensure that clean, flowing water, the lifeblood of the land, is properly respected and available for all living things. The *Syilx Nation Siwłkʷ Declaration* of 2014 provides the goals and aspirations of the Okanagan Nation concerning siwłkʷ:

- That siwłkʷ is treated with reverence and respect;
- Maintenance of the health and resiliency of siwłkʷ and our tmxʷulaxʷ and timixʷ;
- Self-determination of Syilx, including the right to control our institutions, territories, social order and cultures without external interference or domination and the right to govern land and water use decisions in our territory; and
- To fulfil our role as caretakers of the land and water.

It is further understood that Syilx hold water-related rights, unceded at any time to the Crown. Among those rights asserted by Okanagan Nation are:

- Right to fish on territory (focused on more in Section 5 of this report);
- Right to hunt, trap, harvest food and medicines and other materials (which may be affected by inundation and erosion pattern changes, among other factors);
- Right to access and freedom within our territory;
- Right to clean water from the territory;
- Right to develop traditional use sites, for example constructing a camp, lodge, trail, or boat launch;
- Right to self-governance, independence and ownership of our lands, territories and customs as the basis for the preservation of our knowledge (Suxtem Policy) – for example in making decisions about water allocations and management of flow;
- Right to decide how the lands, waters and resources can be used – in this case waters;
- Right to manage the lands, waters and resources – in this case waters; and
- Right to take economic benefits from the lands, water and resources - in this case waters.

Overall, the *Syilx Nation Siwɬkw Declaration* (2014, 5) states that:

> *Syilx Peoples have inherent and implicit Aboriginal Title, Rights and Responsibilities to siwɬkw. Syilx People must be at the forefront of all siwɬkw planning, siwɬkw protection and siwɬkw operational processes including allocation and generation.*

These culturally relevant water indicators, values, aspirations and rights are the lens through which effects on *siwɬkw* must ultimately be assessed.

4.2.2 Water Conditions and Values at Contact

Prior to contact with European peoples, water had played a critical role in the lifeworld of the Okanagan for thousands of years. It was central in relation to spirituality and stories, transportation, food security and rights practices, drinking, governance, and knowledge sharing. For example:

- **Spirituality and stories:** Water and water spirits have always played a critical role in the worldview of the Syilx, a sacred place in spiritual teachings.
- **Transportation:** Water was the easiest and most commonly utilized form of transportation for Syilx peoples throughout our territory, due to the major river systems, chief of which was the mainstem of the Columbia River, including Arrow Lakes. Trade and seasonal rounds were conducted using major waterways.

Figure 4.1: Syilx Travel by Traditional Sturgeon-nosed Canoe on the Columbia River. ON Archival Photo.



- **Food security and rights practices:** Water provided food in the form of salmon and other fish (and spawning habitat for same), aquatic, riparian and wetland plants and medicines, and the support of terrestrial ecosystems, especially in valley bottoms preferred by many harvested species.
- **Drinking water:** Drinking water was available at well-known locations on the land and was pristine in quality prior to contact.
- **Governance:** While Syilx lived in harmony with water and the natural laws that governed it, they were not passive in relation to it. There were rules and norms, guiding principles, discussed above, which had to be adhered to. And water within the traditional territory was one of the primary factors in political governance: "The traditional territory of the Syilx was ferociously protected and defended as the major water systems were recognized as being central to all life. The survival of the Syilx depended on their ability to control these water systems" (Sam 2008, 2).
- **Knowledge sharing:** As a group which travelled extensively across their cultural landscape on seasonal rounds, bands of Syilx relied heavily on knowledge of landforms, natural hazards, and water flow patterns and cycles, to make their way safely and to harvest from territory. Being at the right place at the right time, was intricately tied up with knowledge of water cycles and waterways.

In the end, it is difficult to impossible to characterize the magnitude of importance water played for Syilx prior to contact.

4.3 Change Over Time in Syilx Water Values

Please note: Syilx consideration of cumulative effects on water was completed within constraints of time and funding available. Fundamental limitations include that no cumulative effects assessment on water has been conducted by BC Hydro in relation the proposed Rev6 Project.

4.3.1 Early Contact: Pre-Hydro Era Conditions – A Natural Columbia River Basin

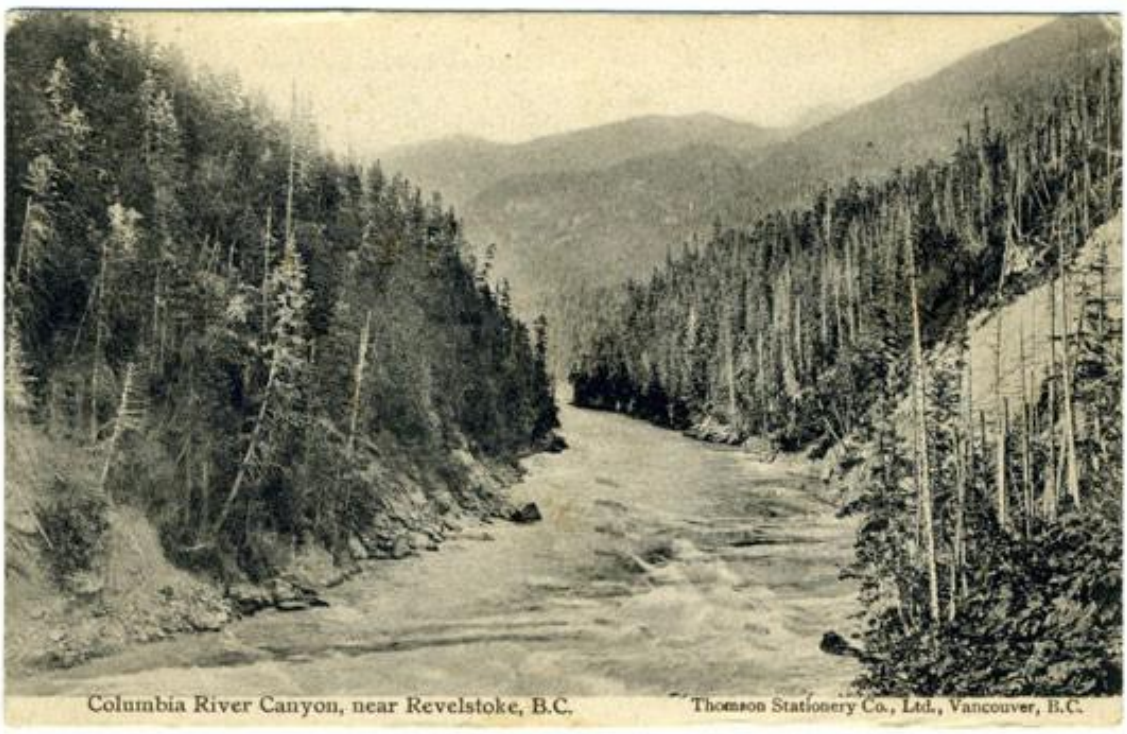
The two major river systems used by the Okanagan were the Okanagan River and the larger Columbia River Basin, into which the Okanagan River drained. Johnson (2015, 6) describes the Columbia River as "a life force" for the Okanagan Nation. Approximately 86% of Okanagan territory is within the Columbia River Basin. The Columbia River Basin is North America's fourth largest, at some 672,100 km^2. Approximately 15 percent of it is in Canada, with the headwaters at Columbia

Lakes in south-central BC. Much of the total flow of the river originates in Canada, (approximately 38% of average annual flow and as much as 50% of peak flows (Hyde 2010).

Prior to the late 1960s, the Columbia River system in Canada remained largely unregulated; in other words it was a natural hydrological regime, with minimal natural lake storage in places like Arrow Lakes. The area now covered by Revelstoke Reservoir, for example, was running river (see images above and at right).

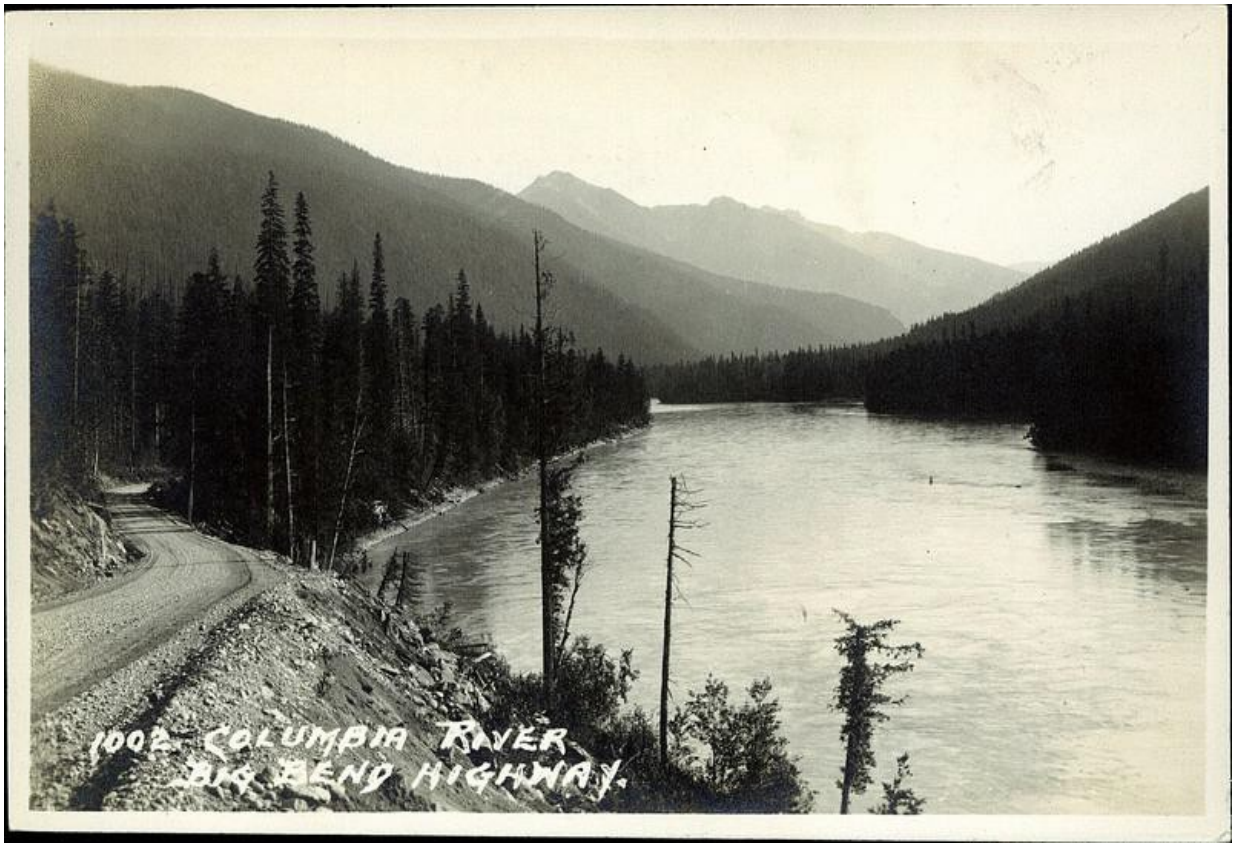
According to data from Hyde (2010), in 1929 streamflow in the Columbia River measured at The Dalles, Oregon, showed variation between low flows of below 100,000 cubic feet per second (cfs) from September to January, up to high flows some five times higher each June. This annual cycle of freeze and thaw, rising freshet and falling waters into the fall, was well known to the Okanagan people, and their activities and travels designed to take advantage of seasonal resources in the Arrow Lakes and north in the Columbia River system.[9]

Figure 4.2 Columbia River Canyon, near Revelstoke B.C. Image courtesy of Thomson Stationary Co., Ltd.



[9] The lack of natural storage capacity and the high freshet flows in the system created strong flood potential downstream, mostly in what became the US portion of the Columbia River Basin, which led directly to the desire by settler society to curb the natural flow of water in the 20th century (Hyde 2010).

Figure 4.3 Columbia River, Big Bend



As can be seen from historic photographs (above) and aerial imagery from the period prior to regulation, the Columbia River between the Big Bend and Revelstoke was wide, being approximately 70 m wide, turbulently meandering within a valley constrained within mountains.

From Revelstoke south to Arrowhead (the uppermost point of Upper Arrow Lake), the Columbia River remained approximately 70 m wide but became less violent, passing through a wider valley so braids and islands became a feature of the river. A number of creeks and rivers fed into the Columbia River, including Kirbyville, Goldstream, French, and Bigmouth, Downie, and Carnes Creeks, as well as the Jordan, Tonkawatla, and Illecillewaet Rivers, increasing turbulence along the way (Bilsland 1955). The Columbia River carried larger sediments between Big Bend to Revelstoke, with medium and finer sediments starting to be dropped out between Revelstoke to the Arrow Lakes, and within the various channels along this stretch of the river.

The river became shallow, creating rapids at a number of locations along the stretch between the Big Bend to where the river naturally widened and deepened at the former location of Arrowhead; most rapids being found between Big Bend and Revelstoke.

The Columbia River Basin is shown in Figure 4.4 below.

Figure 4.4: Columbia River Basin



Columbia River water depth near Revelstoke ranged between 9 to 12 metres in 1940, with a water discharge of 400 m^3/s (14,126 cfs) in April, rising to 2,300 m^3/s (81,224 cfs) for June and July, then

dropping to 1,300 m^3/s (45,909 cfs) in August, and down to 300 m^3/s (10,594 cfs) by November (Government of Canada 2016a). The highest flood on recent record reached just over 5,000 m^3/s (176,573 cfs) in 1948 (Government of Canada 2016a).

4.3.2 Change Since the Start of the Hydro Era in Canada (post Columbia River Treaty)

There were a limited number of direct impacts to the Water VC in the years prior to initial major damming of the Columbia River in the1930s. A number of towns and villages were developed adjacent to the river, for example the town of Revelstoke, agriculture in the floodplain began, and transportation network was developed, including the Big Bend Highway. In general, however, the Columbia River hydrological regime remained similar to natural conditions in this pre-Hydro era.

4.3.2.1 Damming the Columbia River in Canada

While changes caused by damming in the United States portion of the Columbia River Basin (CRB or Basin) had multiple effects on fish (especially salmon) access into and out of the BC portion of the Basin starting in the 1930s, primary hydroelectric-caused effects came later in Canada.[10] The Columbia River Treaty, signed in 1961 and ratified by 1964 by the federal governments of the US and Canada (with no involvements of affected First Nations – Johnson (2015, 6), required the construction of three large dams in the Canadian portion of the Columbia River, for flood control and hydroelectric benefits.[11] This eventually flooded over 40,000 acres (>16,000 ha) of prime valley bottom lands to store 15.5 million Acre feet of water (Johnson 2015, 11), more than doubled the amount of reservoir storage in the basin, and saw substantial alteration of seasonal flow fluctuations in the CRB. With impoundment and regulated release, average monthly flows (previously with lows of 90,000 cfs and highs of 450,000 cfs), saw less variation, flattening out to September low flows of 110,000 cfs, and June high flows of 270,000 cfs (Hyde 2010).

Significant alteration to the Columbia River downstream of the current location of the Revelstoke Dam occurred with water retention associated with the Hugh Keenleyside Dam in 1968. As a result, the Columbia River became significantly wider and deeper in two locations – Upper Arrow Lake

[10] While the focus in this section is on changes that occurred in the mainstem of the Columbia River system, many other changes such as increased withdrawals and diversions related to agriculture, logging, residential and other setter activities, were also impacting on Okanagan water rights and interests in the more western part of our territory during this time period. For example, a 1954 flood-control project channelized a section of the Okanagan River that previously meandered between Okanagan and Skaha Lakes. Johnson (2015, 15) notes that this portion of the Okanagan River lost 50% of its overall length and about 90% of its wetland and riparian habitat through this channelization process. Sam (2008, ii) notes that “oral testimonials from Penticton elders… demonstrate the severity of biological loss and give eyewitness accounts of the negative social, economic, cultural and political impacts caused by this radical alteration to the river.” These types of changes also contributed to cumulative alienation of Okanagan water rights and related interests.

[11] These are the Duncan, Mica, and Keenleyside Dams.

and Lower Arrow Lake. These two lakes became conjoined, deeper, and wider, increasing from a combined surface area of 350 km^2 to a surface area of 476 km^2 (or 35,000 to 47,600 ha – Shaw et al. 2012).

The Revelstoke Dam started construction in 1978 and began operation in 1984 (SNC-Lavalin 2016a). It was constructed as a six-unit generating station, units 1-4 operating from the beginning, unit 5 beginning operation in 2010, and unit 6 now proposed to meet generation requirements of the Province, with an anticipated start of operations in 2021. The Revelstoke Dam is part of BC Hydro's Columbia River hydroelectric system, being situated between Mica Dam (operating since 1973, producing power since 1977), upstream, and Hugh Keenleyside Dam (operating since 1968, producing power since 2002), downstream (Virtual Museum of Canada 2016). The Mica and Keenleyside Dams are water storage facilities, due to their primary function of controlling water levels, while the Revelstoke Dam is operated as a run-of-river reservoir, gravity facility, since it is operated for power production. From a water perspective this means water is held back at the Revelstoke Dam (i.e., there is water storage), but is released more frequently than the water storage dams in order to meet electricity dispatch requirements that are changing faster, e.g., by the minute, than flood control requirements, e.g., by the season.

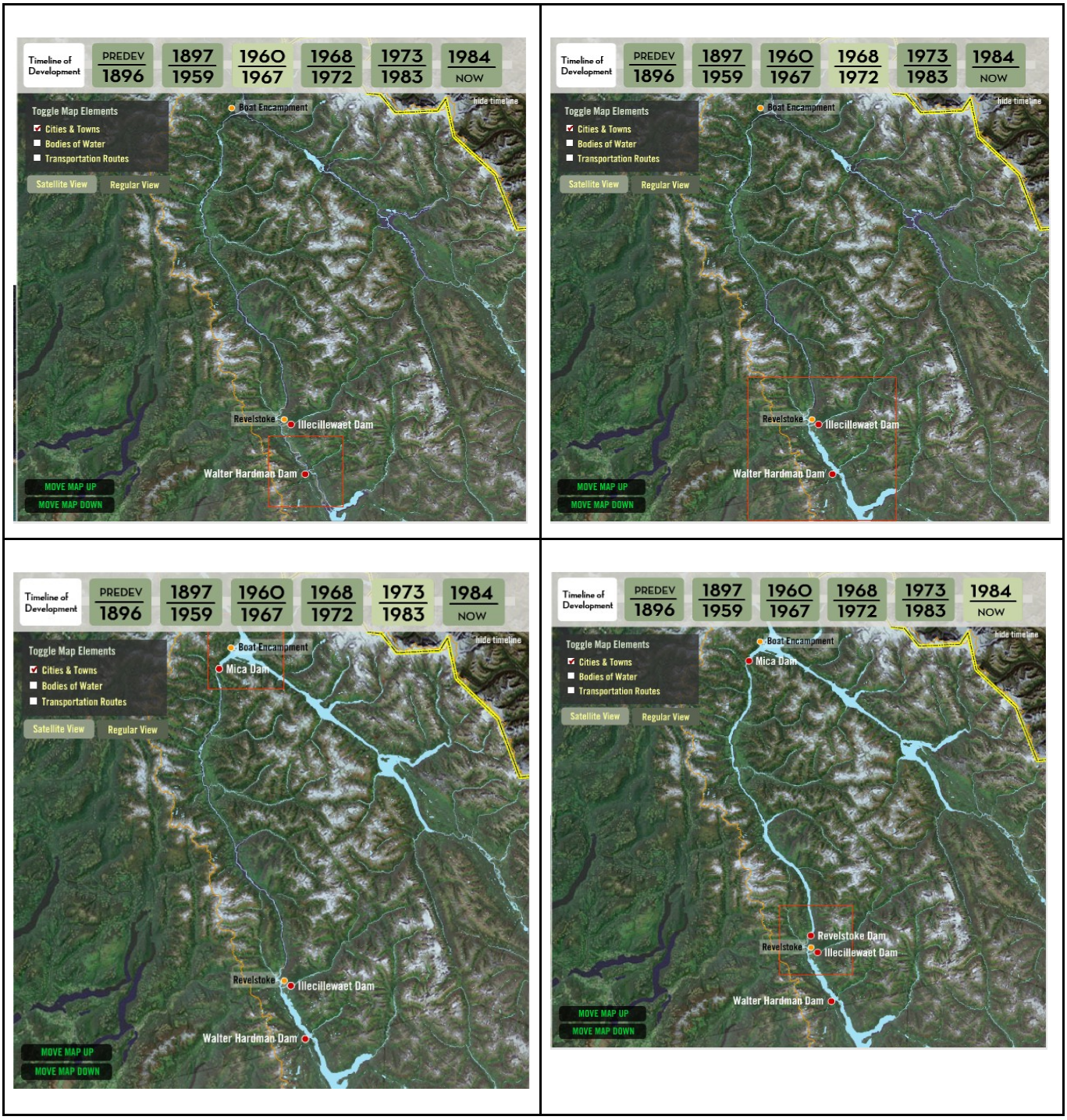
With construction of the Revelstoke Dam, 128 km of the Columbia River north of Revelstoke was flooded to become rebranded as Lake Revelstoke. The infilling of the river valley flooded seven rapids between Big Bend to Big Eddy, including: Gordon Rapids, 12 Mile Rapids, Dalles des Morts (Death Rapids), Priest Rapids, 18 Miles Rapids, Steamboat Rapids, and Little Dalles Canyon (aka Revelstoke Canyon). Portions of the Big Bend Highway (aka Highway 23 North), built in 1930's were re-routed to avoid flooding.

Figure 4.5 provides a visual representation of the effects of increasing water level on changes to the Okanagan cultural landscape from inundation during the Hydro Era, as dams were placed in the region.

By 1972, the Arrow Lakes south of Revelstoke had joined and become deeper and started to develop reservoir characteristics as a result of the Keenleyside Dam. Between 1973 and 1983, the Mica Dam created the massive Kinbasket Reservoir, far up into the headwaters of the Columbia. And after 1984, the remaining Columbia between Revelstoke and Mica Dam became the Revelstoke Reservoir.

Water depth and flow patterns altered radically as a result. Water depth in much of the Columbia River in Canada has deepened with impoundment. As noted previously, water depth near Revelstoke in the Columbia River averaged between 9 and 12 metres in 1940. BC Hydro now operates the Revelstoke Reservoir at 125 metres deep (BC Hydro 2012). In places immediately downstream of dams, daily fluctuations in water levels are now common.

Figure 4.5: Inundation from 1960 to Present in the Columbia River Basin in Canada[12]



[12] Source: Virtual Museum of Canada – http://www.virtualmuseum.ca/sgc-cms/expositions-exhibitions/hydro/en/map/

While seasonal flows variations levelled out, daily and even hourly variations have increased radically in the system. High flood levels on the Columbia at Revelstoke (as high as 5,000 m^3/s (176,573 cfs) in 1948 (Government of Canada 2016a), are now regulated by BC Hydro at a maximum of 75,000 cfs release from Revelstoke Dam from the current five penstocks and generating units, with lows of down to 5,000 cfs (Walker-Larson 2016).

In 1968, the year the Columbia River was dammed by Hugh Keenleyside at the south end of the Arrow Lakes, Columbia River water discharge measured at Nagle Creek, near Revelstoke, peaked at 2,800 m^3/s (98,881 cfs) in July, dropping to 200 m^3/s (7,063 cfs) by November of that year (Government of Canada 2016c). These numbers are similar to those seen in the 1940s. Starting in 1973, discharge patterns were highly reflective of flood management controls associated with Hugh Keenleyside Dam. By 1977, discharge became normalized and fairly steady-state discharge, year-round discharge ranging between 200 to 1,000 m^3/s (7,063 to 35,315 cfs).

Overall, BC Hydro now has 12 dams operating on the Okanagan Nation territory of the 19 such facilities overall in the Columbia River Basin in Canada. These facilities generate approximately 50% of BC's hydroelectric power (Utzig and Schmidt 2011).

4.3.2.2 Effects of the Columbia River Treaty and Damming the Canadian Columbia

The CRT, its associated dams, and the rapid expansion of BC Hydro since 1968, has caused massive changes throughout Okanagan territory, but especially in the Columbia River area as reported by Okanagan Nation Alliance (2014, 11):

> *The Columbia River Treaty is a 30-year renewable multi-million dollar water storage agreement between Canada and the USA in the upper Columbia River Basin, designed to hold back water run-off for maximizing power generation and flood control. It led to the construction of four major Canadian dams that began in the late 1960s that flooded much of the Slocan (Arrow Lakes) valley and converted the Upper Columbia watersheds into a massive reservoir system for the storage and management of millions of acre feet (15.5 million acre feet) of new water. This action created one of the most significant and ongoing infringements to our collective Title and Rights.*

Johnson (2015, 12) similarly argues that the CRT has had "massive impact to First Nations Title and Rights interests":

- Flooding thousands of acres of critical land – inundating village and burial sites, destroying fishing and hunting grounds, fertile valley bottoms and many sacred sites;
- Altering the Canadian portion of the Columbia river system into an industrial managed reservoir; and

- Causing continual impacts on eco-systems and fisheries, the structure and health of the river and reservoir shoreline through erosion, dust, invasive species and continuing exposure or flooding of ancestral remains.

Substantial losses to rivers, river tributaries, and small lakes has occurred through construction of the dams, including the loss of 625 km of sixth order and greater rivers, and five small to medium size lakes having a surface area of 25 km^2 and 5.5 km^2 shallow water habitat (Shaw et al. 2012). Today, there are some 60,000 hectares (or 600 km^2) of valley-bottom land flooded in the Canadian portion of the Columbia River Basin.[13]

> *The CRT was designed for flood control and power, with the objective of smoothing out Columbia river flows within the year and over several years. By its very nature, then, the CRT has altered the pattern of annual water flow in the Columbia River and affected a vast and complex ecosystem from the headwaters to the ocean. Therefore, many associate the CRT with adverse effects on fish and wildlife, especially the reduction in non-hatchery anadromous fish… due to the reduction in flows that aid spawning and downstream migration. Others lament the loss of land submerged by the reservoirs and impact on some resident fish and wildlife. (Hyde 2010)*

Overall, the development of the Keenleyside (1967-8), Mica (1973), and Revelstoke (1984) dams has substantially altered the flow dynamics, storage structure, ecosystems structure, seasonal variation, species distribution and composition within, and volume and speed of movement of water in the Columbia River Basin. Kinbasket Lake is now a massive reservoir, the powerful stretch of the Columbia River from Kinbasket to Revelstoke is now a reservoir, the Mid-Columbia River to Arrow Lakes has substantially altered in nature and dynamics, and the Arrow Lakes have deepened and changed, with increased water levels inundating many critical cultural and ecological areas (Pieters et al. 2003).

Ongoing impacts stem from flow regulation and physical obstructions including “natural flow dynamics leads to changes in aquatic community structure, changes in stream temperature regimes, modified sediment regimes, associated changes in channel bed structures, as well as modified nutrient dynamics” (Shaw et al. 2012).

In 2011, Utzig and Schmidt released a study listing multiple factors that have changed as a result of the 12 BC Hydro dams in the Columbia Basin in Canada. Table 4.2 identifies some of these major changes.

[13] According to blog.gov.bc.ca/columbiarivertreaty/faqs/

Table 4.2: Summary of BC Hydro Dam Footprint Impacts in the Canadian CRB

Factor	Revelstoke Dam and Reservoir	Keenleyside Dam and Arrow Lakes	Total BC Hydro in Canadian CRB
Pre-dam aquatic and terrestrial ecosystems inundated (at full pool)	11,451.4 ha (0% was lake environment previously)	51,269.9 ha (~69% was lake environment previously)	121,602.9 ha (~34% was lake environment previously)
Terrestrial habitat lost	8,882 ha	14,258 ha	68,474 ha
Primary productivity loss (tonnes C/yr)[14]	From 138,240 down to 1,639 (96% decline)	From 139,163 down to 14,559 (90% decline)	From 878,733 down to 38,782 (95% decline)
Lotic (riverine) habitat loss due to inundation	No data	No data	1,604 km lost from a 38,000 km system
Lentic (lake/reservoir) increase due to inundation	No data	No data	From 1,187 km^2 to 1,880 km^2 (58% increase)

Utzig and Schmidt (2011) found that the footprint of BC Hydro dams in the Columbia River Basin have had the following impacts (where the term significant is used, it is theirs):

- Habitat loss: **Significant** amounts of forests, wetlands, floodplains and rivers were lost to inundation. This includes losses of high value ecosystems including 11,700 ha of river, 12,600 ha of wetlands, 24,000 ha of upland environments, and 26,700 ha of floodplain. Overall, losses of lake and river shoreline habitats were rated high for Arrow reservoir and medium-high for Revelstoke reservoir.
- Reduction in primary productivity: A **significant** almost 95% decline in the amount of carbon production per year was lost in the dam footprint areas, with the most substantial reductions in the Arrow, Revelstoke and Kinbasket reservoirs.
- Effects on species:
    - Aquatic: A variety of adverse effects on fish associated with loss of riverine habitat, nutrient losses, changes in flow regimes, and change in water quality/turbidity, were identified (as were some benefits from reservoirs on some species);[15]
    - Terrestrial: Sixty-four Priority 1 species and 46 Priority 2 species were identified as being subject to high habitat impacts from the dam footprints, especially wetland and riparian specialists;

[14] Tonnes of carbon per year generated by the conversion of solar energy into organic carbon by plant photosynthesis; lost primarily in this case due to the loss of forested ecosystems.

[15] These adverse and beneficial impacts and their significance are discussed more in Section 5 of this report.

- **Significant** alteration to ecological functions and processes: Altered hydrologic regimes and floodplain processes, disruption of natural disturbance regimes, trophic dynamics, nutrient cycling, and a variety of intra- and inter-species dynamics have altered for both aquatic and terrestrial species. The annual transfer of carbon and nutrients between floodplain, wetland and aquatic ecosystems, has also been altered.
    - Natural diversity in ecological functions has been lost as well. For example, the amount of reservoir and lakes has increased by 58%; however, lake diversity has reduced "with 12 lakes being replaced by 12 reservoirs" (ii).

It is clearly evident that the Hydro Era, whether considered on the geographic scale of the Columbia River Basin in Canada, or the only slightly smaller scale of BC Hydro's activities within the CRB, has seen significant alteration from a natural water regime to a highly artificial, human controlled one with an altered footprint. The next section examines the implications of these changes on Okanagan water values and rights.

4.3.3 Change Over Time on the Okanagan Water Valued Component

Table 4.3 identifies changes over time to water in the Columbia River system, that have impacted (directly or indirectly) on the Okanagan people. This table was developed using a mixture of BC Hydro information, other technical studies, and Okanagan observations and traditional knowledge of change over time. Indeed, Okanagan Values in relation to water have never changed; it is the physical attributes and level of respect for water and its treatment, especially in the Hydro Era, that has changed radically.

Please note that Okanagan Nation does not have access to adequate information to conduct a full characterization of change over time from pre-dam conditions in making these characterizations. This is one of the reasons we are calling for a full cumulative effects assessment for the Columbia River Basin, including reconstruction of a pre-industrial ecological conditions set, and associated detailed traditional use and traditional knowledge study with the Okanagan focused on the effects of cumulative change of dams in the Hydro Era on Okanagan water values, indicators and rights.

Table 4.3: Changes over Time Since Contact in the Columbia River System

Factor	Pre-Contact	Current	Impacts on Okanagan Rights & Interests
Flow Regime	Natural – very low in winter; highest in June-July	Regulated; water flows flattened for reduced seasonal variation in water levels to avoid downstream flooding; increased day to day and even hourly fluctuations, especially in reaches downstream of dam release points (e.g., Mid Columbia River); flood events 2-year, 5-year, 100-yr non-existent or much greater return interval	Alteration to natural seasonal range of water variation; alteration to aquatic and riparian ecosystem function and ability to support critical life stages of harvested species
Confluences (of mainstem Columbia River and tributaries)	Natural seasonal changes in location and mixing; highly critical for spawning of many species	Many prior confluences and floodplains permanently inundated; loss of habitat critical to aquatic and riparian dependent species (spawning, rearing)	Changes in distribution and abundance of fish species; reduced harvesting success; inundation of critical cultural, gathering, harvesting, areas; loss of utility of site-specific traditional knowledge
Water speed	Turbulent water flow through much of the system, with minimal natural storage in lakes (except for in Arrow Lakes)	Slower water flows in reservoir areas (longer flushing rates), elevated speed of water below discharge points from dams, increases total dissolved gas pressure, which can have adverse effects on fish; increased localized erosion potential	Uncertainty about water speed and amounts leading to alienation of harvesters from Revelstoke Dam to Upper Arrow Lakes (and Mid Columbia River, in particular); increased risk to localized erosion and cultural loss
Water height fluctuations and shorelines	seasonal flow pattern and water level rise	Permanently flooded portions of Columbia River and downstream reaches of multiple tributaries with water levels in some places over 100 m higher than natural; reduced seasonal variation in much of watershed; water level rise and fall is less related to seasons but occurs on hourly/daily interval; increased waterway width created barriers to migration, reduced genetic diversity, and	Continually changing shoreline; loss of multiple archaeological resources with high cultural value (see Section 6); inundation of fish spawning areas for multiple species (see Section 5); reduced faith in safety of transiting an area and leaving a boat or supplies on the rapidly changing shoreline

Factor	Pre-Contact	Current	Impacts on Okanagan Rights & Interests
		mortality risk to terrestrial animals (especially ungulates and furbearers)	
Structures in water	No permanent structures	Multiple, extremely large man-made structures (e.g., Keenleyside, Revelstoke and Mica Dams)	Multiple locations where Columbia River is impassable for Okanagan navigators and fish; reducing ability for both to freely travel on ancestral waters
Fish passage	Constrained only by natural, but largely passable, hazards (multiple rapids)	Constrained by multiple anthropogenic hazards, including multiple impassable structures	Implications discussed in Section 5 (Fish and Fishing)
Fish numbers and habitat	Natural distribution of fish species and fish habitat (within a range of natural variation)	Virtual extirpation of salmon from Columbia River Basin in Canada; reduced spawning habitat and reduced fish numbers and distribution, including in Arrow Lakes, Mid Columbia River and Revelstoke Dam area, due to multiple factors including inundation of critical spawning and rearing habitat; replacement of river with reservoir habitat	Implications discussed in Section 5 (Fish and Fishing)
Nature of lakes	Small number of large oligotrophic lakes (Upper and Lower Arrow Lakes)	Multiple oligotrophic reservoirs (e.g, Revelstoke, and Kinbasket), and even more oligotrophic Arrow Lakes; much deeper lakes/reservoirs with more stable water temperature regime and increased thermal stratification; fluctuating shorelines depending on release of water from dam (can be daily changes)	Effects on fish species distribution and abundance discussed in Section 5 for fish; alteration in conditions reducing traditional knowledge rooted in place; alteration of visual aesthetics and connections to landforms; inundation of large areas of high harvesting and cultural value
Erosion patterns and rates	Natural regime – gradual channel relocation and land development (by floodplain sedimentation and plant colonization) in some sections	Reservoir and downstream river sections shoreline heavily and repeatedly subject to flooding due to daily flood/drain cycle, further compounded in winter with freeze/thaw and exposing shoreline to cold air (when it used to be insulted by snow cover).	Erosion of archaeological and other cultural heritage and use sites in Mid Columbia River; increased uncertainty about erosion patterns and timing contributing to lack of faith in harvesting from this portion of

Factor	Pre-Contact	Current	Impacts on Okanagan Rights & Interests
	(e.g., between Little Dalles Canyon and Upper Arrow Lake)	Increased localized erosion rates downstream of dams due to fluctuations and elevated water speeds from variable release.	territory; alteration to river channel morphology and visual references reduces applicability and utility of pre-existing traditional knowledge of place
Water quality characteristics	High sediment and mineral loading during spring freshet,	Altered water quality in both reservoirs and downstream of water release points from dam – reduction in temperature fluctuations through the year, stratification of water temperature in reservoirs, increased nutrients in reservoirs and reduced nutrients in riverine stretches; reduced overall turbidity in system; potential increase in mercury methylation	Potential for methyl mercury bio-accumulation in fish creates concerns for Okanagan harvesters (human health) as well as potential adverse effects on fish health and reproduction
Transport of sediment	High in late spring and summer; created fertile areas downstream, deposition in floodplains during summer	Reduced amount of sediment transported through system, lower sediment load in water column; reservoirs act as settling ponds	Reductions in turbidity may adversely affect habitat for species like white sturgeon; increased water clarity downstream of dam

4.3.3.1 Discussion of Cumulative Effects to Date on the Syilx Water Valued Component

A variety of adverse cumulative effects on Okanagan water indicators have been identified in the pre-Project Case. Overall, radically increased anthropogenic control over water in the Columbia River Basin since contact has had the following primary (but not exclusive) cumulative effects:

- Complete extirpation of Pacific salmon from the Columbia River system (see Section 5);
- Loss of large amounts of fish spawning and rearing areas, and important riparian and wetland habitat, through inundation of riparian and confluence areas (see Section 5);
- Reduced faith in water quality and lower willingness to drink water from the land;
- Fundamental and unnatural change in the aquatic, shoreline and terrestrial ecology, especially in reservoirs but also downstream of dams;
- Reduced navigability of key portions of the Columbia River system;
- Reduced/removed/increased risk of access to large portions of shoreline;
- Inundation of multiple archaeological and other spiritual and cultural use and value sites and places (see Section 6);
- Loss of critical habitation and harvesting sites through inundation;
- Substantial reductions in the primary productivity of inundated areas and loss of forested areas with high terrestrial species values;
- Reduced knowledge of Okanagan cultural landscape, especially through changes to physical characteristics and knowledge of water regime (for example, changes in landform visibility associated with increased water levels, leading to reductions in the ability to recall and share stories about the cultural landscape, and to navigate via traditional visual landmarks – see Section 6); and
- Continued and exacerbated loss of Okanagan governance over water on territory (started during 1800s), and related inability to meet water stewardship requirements or adhere to laws and norms associated with water.

As a result of anthropogenic changes to the Upper Columbia watershed, primarily associated with BC Hydro dams and hydro-electricity generation and transmission facilities, especially in the Mica Dam to Revelstoke Dam area, and on into the Arrow Lakes, water quality, flow dynamics, and habitat values have been seriously altered over time and in many cases exceed the range of natural variation. Examples of notable impacts that have resulted in large scale changes in watershed habitat functionality include the inundation of large amounts of riparian areas where tributaries emptied into the Columbia River/Arrow Lakes area, reduction in peak discharge flows and seasonal variations as a result of multiple dams on the Columbia River, and artificial changes, often

on a day to day and even hourly basis, in water amounts released, its flow velocity, and shoreline levels downstream of dams.

Okanagan aboriginal rights, many of which rely upon water and some of which are directly related to water (its use, control, management and protection) have been subject to a large number of serious constraints since contact, accelerating during the “Hydro Era”. Many of the enabling conditions required to support meaningful practice of Okanagan rights have been reduced in quality or eliminated entirely.

In addition, Okanagan laws and norms associated with water, passed down from time immemorial and guiding principles in a well-defined governance system prior to contact, are now difficult to impossible either for Okanagan to practice or to require the Crown and industry to practice. Canadian, BC, and BC Hydro management of water-related issues is in a pre-existing and substantial state of non-conformity with Okanagan water laws, norms and guiding principles.

As a result of historical and on-going watershed impacts, the Upper and Mid Columbia River watershed in Canada now functions in a diminished capacity. As such, it already in the pre-Project condition set does not adequately serve the cultural or environmental needs of the Okanagan people. Nor does it serve the valued and relied upon aquatic and fish habitat Okanagan people have for generations relied upon and continue to be stewards of (this is discussed more in Section 5). Aboriginal rights associated with water have also been subject to severe constraints, especially in the “Hydro Era.”

It is into this already highly altered water context that the Rev6 Project is proposed.

4.4 Revelstoke 6 Project Effects on Okanagan Water Values

Please note: Initial draft materials on operation of the Project and impacts on Okanagan livelihoods and economy are discussed here; the technical information is primarily from BC Hydro and still to be subjected to technical examination between the parties. Impact pathways identified below may not be comprehensive and are provided without prejudice; others may be identified as new information emerges. Final BC Hydro EAC application materials are required in order to complete the impact pathways delineation and subsequent impact characterization assessments.

4.4.1 Potential Interactions of the Project with Okanagan Water Values

Based on the information available at the time of drafting of this Part C Report, the following Project-specific effects pathways are predicted for the Rev6 Project on Okanagan water values:

Reduced navigability of, and free movement across, Okanagan territory: Historically and to the present day, Okanagan transportation has been highly reliant on water-based transport. Already, navigation and use of the Mid Columbia River and Upper Arrow Lakes and Revelstoke Lake are reported by members to be unpredictable and dangerous. Any exacerbation of existing adverse effects on day-to-day water level fluctuations in the Revelstoke Dam and Mid-Columbia River area downstream of the Dam, which creates concerns about the safety of navigation and harvesting from these areas for Okanagan members and contributes to alienation from territory (see also Section 8). It is understood that this more intense daily fluctuation may be especially higher in winter months and could lead to unpredictable and potentially dangerous instream conditions, increased shoreline erosion and slumping, loss of equipment including boats, and exposure of and damage to Okanagan heritage sites and values (see also Section 6);

Adverse effects on Okanagan water stewardship and desired protection of aquatic ecosystems: The Rev6 Project will increase the intensity of maximum water releases at the base of the Revelstoke Dam to up to a sought regulated maximum of 93,000 cfs.[16] By doing so, it will increase the already high level of artificial regulation of water in the Columbia River Basin. This commodification of water is contrary to Okanagan water values and stewardship norms. In addition, the increased water velocity during peak release periods is likely to adversely affect Okanagan efforts to re-establish aquatic ecosystems in the already altered and damaged Mid Columbia River area, including adverse effects on critical white sturgeon breeding grounds.

In addition, at a fundamental level, the Rev6 Project will continue the disrespect of water as a sacred entity, an Okanagan relation that connects all life and has many natural laws to learn from in its natural form. The Project will continue the lack of respect through licensing, commodification, alteration of movement, and pollution, that earlier BC Hydro projects have initiated. The free movement of water and all life within it, especially our lost salmon, has been severely curtailed with no end in sight. This is a fundamental affront to Okanagan natural laws, which has environmental and cultural implications for us, and our territory.

Altered water quality: The Rev6 Project has the potential to adversely affect water quality downstream of the Revelstoke Dam to an as yet inadequately predicted degree. This may include lower sediment loads in the water column, changes in temperature, pH, and nutrient levels, which may alter aquatic ecosystem health and the distribution and abundance of fish and other aquatic species. *More information is required from BC Hydro on the downstream water mixing zone in the Project Case, before Okanagan can make an informed estimation of the spin off effects of physical changes onto Okanagan rights and interests.*

Altered water quantity in the Mid Columbia River: Rev6 will bring more intense daily fluctuation and thus more variability to water levels, especially in winter months. This variability is

[16] Maximum water discharges will be increased from 2,124 m/s (75,000 cfs) to 2,633 m/s (93,000 cfs) (BCHydro 2016, Part A).

unpredictable and potentially dangerous as it can lead to areas drying, being exposed and/or to flooding and erosion.

Increased water release during peak periods and associated changes to channel morphology in the Mid Columbia River: The addition of Rev6 will increase total water discharge during peak periods, and water velocity and increased pressure will increase channel incisement in the immediate downstream area, and increase sediment transport, in ways that have yet to be properly characterized by the Proponent, but which may include accelerated rates of erosion on tributary channels and the main stem of the Mid Columbia River.

When compared to the operation with five generating units, Revelstoke Dam with six generating units is expected to discharge higher flows between approximately 60,000 and 75,000 cubic feet per second somewhat more often (about 11 per cent of the time compared to about three per cent of the time currently). The facility is expected to discharge medium flows (between approximately 35,000 and 60,000 cfs) somewhat less often and low flows (less than 35,000 cfs) about the same. Flows are expected to be above 75,000 cfs less than one per cent of the time.

Adverse effects on the health of aquatic and wetland ecosystems: Higher discharge rates, erosion and flooding – all changes predictable from Rev6 – all have effects on the surrounding ecosystems. Of particular note are the effects that the spring max load scenario has on nesting birds (specifically short-eared owls-*SARA listed species, special concern*) and breeding western toads (*SARA listed species, special concern*) in Cartier Bay. There are also outstanding concerns that alterations in water level at peaking will result in greater fluctuations in water levels in some of the lower wetlands of the Mid Columbia River.

Increased river level fluctuations and higher max flows may create adverse effects on accessible, undisturbed shoreline: Rev6 has a high potential to further disturb the already altered shoreline of the Mid Columbia River, further challenging access to Okanagan users. As discussed above, more water will flow through the dam each second when the Rev6 turbine is on, which will likely have an impact on the river in the stretches south of the dam. This includes potential alteration (and perhaps speeding up of) erosion patterns in the Mid Columbia River, a major concern from the Rev5 process. Specifically, increased bed shear stresses on riverbanks could result in increased bank erosion.

Due to increased power production, better turbine efficiency of Unit 6, and alteration to facility operation, the total water discharged will increase but the releases will be over a shorter period of time (i.e., higher intensity). With addition of Unit 6, peak discharges are anticipated to increase to 2,832 m^3/s (100,000 cfs), from 2,809 m^3/s (93,000 cfs) (SNC-Lavalin 2016b). The Revelstoke Dam has operated as a peaking power plant with the addition of Unit 5. Because of this, the water discharge rate and reservoir levels can change rapidly on a daily, or even hourly, basis.

NHC's hydraulic assessment modelling indicates that Rev6 peak discharge would result in water depths between 0.35 and 0.60m higher in the Mid Columbia River, water velocity that is between 0.15m/s and 0.30m/s faster and up to 50% greater shear stress and erosion potential in certain locations from Rev5 conditions (2016).

It is of note that BC Hydro may have underestimated hydropeaking impacts on water, for example freeze-thaw impacts to plant communities and bank stability as well as the scope and scale of incision in their Rev5 EA, since impacts are being observed in locations not predicted in the Rev5 analyses (Maltby 2014). BC Hydro has reviewed areas of Rev 5 predicted erosion against actual observed erosion in preparation of their assessment of predicted Rev 6 impacts (for example see Figure 4.1.1-55, Part B BC Hydro 2016). Okanagan is very concerned to review current Rev6 erosion estimates against findings of actual erosion effects from Rev5, as it appears that there may not be a strong correlation between predicted and observed erosion from that EA.

With increased discharge intensity, channel incisement, sediment transport and deposition patterns will be altered and likely the 'plume zone' will be extended further into the MCR and the Upper Arrow reservoir. Water level fluctuation within Revelstoke and Arrow Lake Reservoirs is expected to maintain the same pattern as is exhibited with Unit 5. However discharge volume and intensity is expected to increase, leading to higher potential for shoreline erosion (reservoir and downstream sections of the river), as compared to what has been experienced thus far with the start of Unit 5 operations in 2010.

4.4.2 BC Hydro's Committed-to Mitigation Measures to Reduce Water Impacts

No mitigation measures are being contemplated by BC Hydro for potential project or cumulative effects to the water VC (SNC-Lavalin 2016b: Table 4.2-11 and Table 4.2-12). Indeed, no cumulative effects assessment on water has been conducted or contemplated by BC Hydro at this time.

Please note: Okanagan Nation and BC Hydro have not yet met to discuss required mitigation to reduce potential adverse effects from the Project, alone and in combination with cumulative effects causing agents (including prior BC Hydro actions). At any such meeting BC Hydro is invited to identify additional mitigation it believes will successfully avoid, reduce or compensate for impacts on Okanagan water values

In addition, Okanagan Nation will reserve judgment on assessment of Project-specific or total cumulative effects in the Project Case can occur until information and mitigation gaps are filled – such assessment and any discussion of it is premature at this time.

5. Effects on Okanagan Fish and Fishing VC

5.1. Introduction

The Captikʷɬ *story* "The River People, Coyote and Salmon", as told by Caqcaqalxqn, and included in the Preamble to this report, demonstrates the long relationship that the *Syilx* have to the snkxyknt (*Revelstoke)* and Arrow Lakes areas and the role fish and fishing has played in that relationship. The Rev6 Project, located in this area, has the potential to adversely affect fish, fish habitat, and the ability for Syilx peoples to exercise our Aboriginal rights to fish in the Columbia River system in Canada, pursuant to Section 35 of the *Constitution Act, 1982*.[17] These impacts would be loaded on top of existing cumulative adverse effects on fish and fishing in the Columbia River, and throughout Syilx territory. It is critical to consider both existing cumulative effects and Project-specific effects in combination because Syilx culture, traditions, and ways of life – and associated rights and interests – are critically linked to fish and fishing.

The geographic focus of this assessment is two-fold:

- The Regional Study Area (RSA) is the entire Okanagan territory; in this case all fish-bearing waterways within it, with higher focus on the mainstem of the Columbia River; and
- The LSA is the areas immediately upstream and downstream of the Revelstoke Dam (in the MCR), where Project-specific effects on fish and fishing may be expected to concentrate.

In the draft EA Certificate Application materials issued by BC Hydro and SNC Lavalin on June 24th, 2016, it is stated that there are no potential project interactions identified between fish and fish habitat and the transmission component (capacitor station) of the Project (2016e, p. 57). Okanagan Nation agrees that the Summerland Capacitor Station need not be considered in relation to the fish VC, due to lack of a viable impact pathway to fish and fishing at this location.

A full consideration of Project-specific effects and total cumulative effects in the Project Case cannot be completed until: a. BC Hydro fills information gaps in the assessment materials it has provided Okanagan to date; and b. the parties meet regarding mitigation requirements.

[17] The Canadian judiciary has interpreted the Constitution as protecting traditional Indigenous practices—most notably, salmon fisheries practiced for food, social, and ceremonial purposes. Courts have imposed further legal obligations on the state for meaningfully consultation with Indigenous peoples before taking any actions that may adversely impact Aboriginal rights and interests.

5.2. Setting the Context: Role of Fish and Fishing in Syilx Way of Life

The Syilx have existed along the Columbia River and its tributaries since the "beginning of people on this land" (Armstrong *et al.* 1994, 1). Since time immemorial, Syilx have people depended on the Columbia River and its tributaries for two purposes: transportation and salmon that traversed the basin (Chance 1986). Because of the abundance and diversity of salmon, salmon formed the basis of Syilx subsistence, economy, and culture. With Syilx well-being so integrally dependent on the region's resources, specifically salmon, they have always maintained an irrevocable reverence and respect for salmon as ancestral stewards. **The Okanagan are a salmon people.**

5.2.1 Okanagan Indicators for Fish and Fishing

Fish and Fishing was selected as a VC by Okanagan due to their fundamental importance on many aspects of the Okanagan Nation. Table 5.1 identifies key indicators linked to Syilx values, laws and guiding principles related to Fish and Fishing.

Table 5.1: Key Indicators of Fish and Fishing Values for the Okanagan People

Okanagan Valued Component	Key Indicators
Fish & Fishing	• Food security • Access to preferred fishing sites in traditional territories • Safety on the water • Quiet enjoyment of the territory • Good return on effort (fishing success) • Healthy and abundant preferred fish species (salmon)

5.2.2 Okanagan Fish and Fishing-Related Rights

It is further understood that Syilx hold fishing-related rights, unceded at any time to the Crown. Among those rights asserted by the Okanagan Nation are:

- Right to fish on territory;
- Right to access and freedom within our territory; and

- Right to carry equipment and materials necessary for hunting, fishing, trapping, and harvesting, including such things as arms and ammunition, spears, steel bladed instruments, etc.[18]

5.2.3 Okanagan Laws, Norms and Guiding Principles Associated with Fish and Fishing

Managing and stewarding fish species and their habitat remains an integral responsibility of Syilx people and way of life, as outlined in Syillx laws, norms, and guiding principles.

> *since fishing required allocation and sharing of seasonal resources between families and tribes fisheries management was not a distinct practice separate from government and law; it was integrated in systems of privilege and rank, distinct forms of production and exchange, including extensive networks of ceremonial redistribution and trade. (University of British Columbia Indigenous Foundation n.d.)*

Okanagan laws and norms and guiding principles are discussed in Section 2.4.3. Those natural laws associated with the Fish and Fishing VC include:

- Sustaining the diversity of species and their habitats;
- Activities in the community will be conducted with respect for the land *[tmxʷulaxʷ],* traditions and way of life [naʔk̓ʷl’məntət], prayer *[nk’ʕaməntət];* strength and help), and belief system and spirituality [iʔnunxʷinaʔntət];
- Syilx responsibility to follow the natural laws and make sure the land is healthy – in this case Syilx stewardship of fish and fish habitat;
- Preserve the land in its natural healthy state for each generation through knowledge and the practice of natural law – intergenerational equity; and
- *k̓əɬʕac̓xən*: “always look underneath our actions to see how our actions or the tracks that we leave are connected to the future, to our grandchildren, to the continuation of all creation, and to the tracks that they make on the land into the future” (Armstrong 2007) – in this case, continuation of fish’s role in Syilx traditional knowledge transfer, ceremony, story and belief system.

Syilx laws, norms and guiding principles are part of a worldview that prioritized conservation from year to year and between generations, socially imposed controls on the harvesting and distribution of materials from the land, and treated fish as ancestors and relatives, rather than a commodity.

Relevant Okanagan goals and aspirations related to fish and fishing include, but are not limited to:

[18] The right to clean water, also related to fish, is examined in Section 4.

1. Restoration of salmon in the Upper Columbia River by re-establishing natural pre-contact range of variation in their stocks, including actions such as restoring naturally spawning and hatchery-based runs of sockeye, Chinook coho and steelhead (U.S. Columbia Basin Tribes and Canadian First Nations 2014);
2. Ability for Syilx to harvest salmon in the future from all pre-contact harvest locations;
3. Rehabilitation of White Sturgeon habitat and population health in Arrow Lakes;
4. Ability for Syilx harvesters to feed their families preferred fish species in future generations;
5. Retrenching of Syilx role in governance of fishing and overall fish management.

5.2.4 Fish, Fish Habitat and Okanagan Fishing Conditions at Contact[19]

> *Salmon is quite as essential to the Indians residing inland as grain to us, or banana and plantains to the residents of the tropics; gleaning the regular supply of fish, the Indian literally harvests and garners it as we reap wheat. It cannot be by mere chance that salmon are prompted, by instinct, to [swim] into the farthest mountains, fish that are fat and oily and best adapted to supply heat and the elements of nutrition. – Scholz et al. (1985)*

Syilx oral histories speak of how the many salmon species came into the Okanagan Valley. These stories are dominated by the mythical Coyote; the most important and wisest of ancient animals. These stories relate how *Sen'klip* (Coyote), in preparation for the creation of humans by the Creator, broke through a dam in the lower portion of Big River. The dam had been created by the five hungry Beaver women, for the purpose of trapping salmon returning from the ocean. With the dam breached, the salmon followed Coyote to the upper reaches of the Columbia River and its tributaries, distributing themselves throughout the basin. Coyote taught humans how to capture the salmon, using elaborate tools, such as gaffs, weirs, basket traps, and dip nets. He also instructed the new people how to make fire, clean, cook, and preserve salmon.

To honour the Creator and the salmons' sacrifice to the people, Coyote instructed them to prepare a feast to celebrate the return of the salmon each spring—a traditional celebration that continues to be held by Syilx people. The first Salmon Ceremony each spring symbolizes Syilx "dependence on the salmon and the need to maintain a proper relationship with this renewable resource" (Hudson 1990, 59). Finally, Coyote warned the new people to "never cook any more than you can eat. If you cook three salmon when you are able to eat only half of one, the salmon will be ashamed and will refuse to enter your river" (Clark 1953).

[19] See also Section 2.4.1.1.

The Columbia River acted as the main artery of the Okanagan Nation. Prior to contact, it and its tributaries supported a dynamic fish biodiversity (Scholz *et al.* 1985), delivering five species of salmon via this historical corridor: chinook, sockeye, coho (silvers), chum and pink. Salmon once occupied nearly 13,000 miles of Columbia River Basin streams and rivers.

According to conservative estimates, the Columbia River Basin once produced between 10 and 16 million salmon annually (NPCC 1986). These runs generally extended from March through October, though steelhead runs extended through the winter. The range of the historical mean for salmon run returns above the Grand Coulee Dam was assessed at 2.6 to 3.7 million (The Columbia Basin Tribes and First Nations 2015). The NPPC (1986) estimated that the pre-1850 distribution of all Columbia Basin salmon and steelhead above Chief Joseph Dam was 14.7 percent for spring chinook, 16.6 percent for summer chinook, 14.0 percent for fall chinook, 17.3 percent for coho, 10.5 percent for steelhead, and 64.7 percent for sockeye.

The primary salmon species' that migrated into Canada via the Columbia were sockeye and Chinook (NPCC 1986). It has been recently estimated that Chinook went all the way to the headwaters of the Columbia at Columbia Lakes, some 2000 km from the Pacific, and that Arrow Lakes supported an average annual return of around six million sockeye (Hume 2014, citing work done by the U.S. Columbia Basin Tribes and Canadian First Nations (2014)). Arrow Lakes also supported runs of steelhead and Chinook, with critical rearing habitat for each (Lindsay 1994).

The Revelstoke and Upper Arrow Lakes areas have been identified as important fishing areas by Okanagan Nation members and through ethnographic study. Among the Okanagan fishing areas identified by the Okanagan Nation research team are:

- Where the Nakusp Creek flows into the Columbia River (Boas and Teit 1930, 173) and the Nakusp area in general (nkwusp was known for salmon and lake trout);
- Arrowhead (Kwespits'a7 or kospi'tsa) at the upper most end of Upper Arrow Lake, where the MCR drains into it;
- Tonka watla Creek, or Big Eddy (Skohkuntlque'tl);
- At the mouth of Beaton Creek on the Beaton Arm (Nk'mapelek^{w}s);
- Galena Bay (good for k'kinee or red fish, trout and larger fish; and
- Kuskanax Creek on the east side of Upper Arrow Lake (kwusxenaks).

Sturgeon thrived at this time, as they had free range throughout much of the mainstem of the Columbia and functioned as cleaners, feeding on dead and dying salmon, and were also fished and culturally important. Other fish species of economic and dietary importance inhabited the Columbia River and its lakes and tributaries, include white fish (two species), kokanee (three species), steelhead, dolly varden, rainbow trout, suckers (six species),

lamprey ell, chub fish, squaw fish, ling cod (devil fish), Columbia River smelt, speckled and bull trout (Bouchard and Kennedy 1984; Post 1938).

Fishing for all these species was critical to the social economy and culture of the Okanagan and other First Nations, but especially salmon.[20] Salmon gathering areas of importance were distributed throughout the mainstem of the Columbia, through Arrow Lakes, beyond the big bend at Kinbasket, and along major Columbia tributaries.

During the early contact period, the majority of the Syilx tribes were highly dependent on the salmon that traversed the Columbia and Okanagan River systems. Estimates of the degree of this reliance vary but all agree they were integral to the daily diet of the Okanagan. For example:

- Sam (2008) cites Dryden (1949) that Syilx consumed four or five more times more salmon than other game animals, even curing enough salmon to last them through the long winter months;
- Craig and Hacker (1940) estimated that Indigenous populations consumed one pound of salmon per day; and
- Chance (1973) identified Syilx relied on salmon for fifty percent of their subsistence.

In addition to providing a substantial portion of the subsistence needs of the Syilx people, Salmon were trade commodity of high importance (Post 1938). Thus, salmon provided the foundation for the Syilx subsistence economy (Ortolano et al. 2000).

Syilx people developed extensive methods to harvest salmon during summer runs. Hewes noted that “[f]rom natural rock ledges or wood platforms over the stream, [Indigenous fishers] were able to spear, harpoon, or net salmon in large numbers.” In areas of slower moving water, such as creeks, Indigenous fishers used gillnets, dip-nets, seine nets, hook and line, basketry traps, leisters, harpoons and weirs (Wilson 1970; Bouchard and Kennedy 1984; Teit 1930).

In Canada, it has been estimated that Okanagan/Lake fishers, at or after contact, harvested between 88,500 and 504,000 Chinook, sockeye and steelhead per year (reported in U.S. Columbia Basin Tribes and Canadian First Nations 2014, 12), almost two-thirds of the total catch.

With large numbers of fishers (often from many tribes) at key harvesting locations, extensive salmon fishing regulations were formed:

> *Elders and chiefs regulated the fishing [at Wy-am, also known as Celilo Falls], permitting none until after the First Salmon ceremony. Each day, fishing started*

[20] Scholz et al. (1985) and Ortolano and Cushing (1999), assessed Indigenous catch rates at between 500,000 and 1.3 million salmon—albeit these rates were highly variable seasonally and on a multi-year basis (NPPC 1986; Brugman and Thivierge 2003).

> *and ended at the sound of a whistle. There was no night fishing. And when a fisher was pulled into the water – most who fell perished in the roiling water – all fishing ceased for the day. In later years, each fisher was required to tie a rope around his waist, with the other end fastened to the shore. Elders and others without family members able to fish could take what they needed from the catches. Visiting tribes were given what they could transport to their homes. The rest belonged to the fishers and their families.- Columbia River Inter-Tribal Fish Commission (n.d.)*

Caring for salmon, the river, and other Columbia Basin resources thus became a sacred obligation for the Syilx (Universities Consortium on Columbia River Governance 2015).

5.3. Cumulative Effects on Fish and Fishing in Syilx Territory Since Contact

Fish numbers, distribution and population health, and alongside them, the ability for Syilx to harvest fish, have declined precipitously since contact, accelerating in the late 1930s with the start of the Hydro Era.

5.3.1 Fish and Fishing in the pre-Hydro Era (Contact to the 1930s)

During the early contact period, Syilx people remained heavily reliant on salmon runs that traversed the Columbia and Okanagan River systems within their traditional territory (Sam 2008). Scholz *et al.* (1985) report that the upper Columbia Basin held large concentrations of Indigenous fishermen and fisheries. In 1879, Alexander Diomei, a Jesuit priest, recorded that

> *…sometimes as many as one thousand Indians will be gathered about the mouth of the Okanogan River at the time when the white salmon go up the Columbia River. All the old men, and sometimes the young also, fish steadily from early morning until later in the afternoon (Kowrach 1978).*

The primary harvest sites were riffles or waterfalls, locations were salmon congregated.

Okanagan Elders still recount a time when salmon flourished in the Okanagan system. Syilx people and neighbouring tribes and First Nations congregated near Oroville, where the Similkameen River meets the Okanagan River, which was recognized as the “headquarters for the salmon fishing in this district because the salmon spawned there” (Bouchard and Kennedy 1984, 42-54). There are reports of more than 4,000 people congregating in camps near Oroville during the salmon spawn (Kennedy 1984; Webber 1999). The primary location of Indigenous fisheries on the Okanagan River

was at Okanagan Falls, as salmon migrated into the Okanagan Basin. Other noted fishing sites were located at Beaton Arm of Upper Arrow Lake (Ray 1936) and on the Columbia at Revelstoke (Moberly 1865). Government reports from the early 1900s indicate that Okanagan Falls was passable for salmon, allowing salmon migrate to the tributary creeks of Okanagan Lake (Shepherd 1996).

Depletion of the Upper Columbia River salmon runs occurred between the 1880s and 1910s by commercial fishing and salmon canning in the lower Columbia (Scholz 1985). At this time, the U.S. Bureau of Fisheries were allowing up to 43 million pounds of salmon to be commercially harvested in order to support the forty canneries that had been established on the Lower Columbia River (Wilkinson 1992). Despite this, it has been estimated that indigenous harvest rates remained comparable to catch rates of the industrial fishery peak from 1883 to 1919 on the Columbia River (Craig and Hacker 1940).

5.3.2 Change Since the Start of the Hydro Era

This section examines cumulative effects on fish, fish habitat, and Okanagan fishing rights since the 1930s, what can truly be called the "Hydro Era" for the Columbia River Basin. Of all these changes, hydroelectric dam development since the 1930s has had the most lasting and devastating impacts on salmon stocks and Okanagan fishing. The Hydro Era saw multiple massive dams built along the Columbia River, bringing a sharp decline in salmon populations (Province of British Columbia 2013; Sam 2008; Columbia Basin Watershed Network and Living Lakes Canada 2013), which continues to be a huge point of concern for Okanagan people to this day. Salmon remains a key species for Okanagan culture and identity, diets, and livelihoods, despite being extirpated from the Upper Columbia River.

Salmon stocks in the Columbia still numbered up to 16 million before the first major dam was built in the 1930s, after which point the numbers of salmon dwindled substantially (Glavin 1996). The first dams built on the lower Columbia, Bonneville and Rock Island, included fish ladders that hindered salmon passage but still allowed them to migrate upstream (Wilkinson 1992).

Upon completion of construction of the Grand Coulee Dam in 1941, salmon escapement to approximately 1800 kilometers of natal streams and lakes were cut off. Prior to this, over a quarter of all Columbia River salmon migrated into the Upper Columbia in Canada. From this point forward, salmon were physically blocked from their migration routes up the Columbia:

> *In a matter of months following the completion of the Grant Coulee Dam project the Okanagan tribes were deprived of their primary protein source. Marc De Villiers (2003, 139) contends that, 'the numbers of wild salmon returning to the Columbia River is less than 6 percent of what it had been before the dams were built' (Sam 2008).*

The degradation of habitat was further compounded by the construction of the Chief Joseph Dam, built in 1958, without fish passage facilities (Nelitz, Porter, and Marmorek, 2007). In blocking fish passage, these dams destroyed the anadromous fishery of the indigenous peoples of the upper Columbia in both the U.S. and Canada who had historically depended upon that fishery for subsistence, livelihood and cultural purposes.

The critically important salmon fishery destroyed, directly eliminating a First Nations economy, annual sustenance, and cultural hub, and fragmenting the Columbia between upper (Canada) and lower (USA) reaches. It is estimated by the U.S. Columbia Basin Tribes and Canadian First Nations (2014), 2) that:

> *The bilateral damming and management of the upper Columbia River, initiated with the construction of the Grand Coulee Dam, is responsible for the loss of over 1,100 miles (1,770 km) of salmon and steelhead habitat above Chief Joseph Dam and the loss of about 3 million salmon harvested and consumed by indigenous peoples throughout the basin annually... Little, if any, consideration and accommodation was planned for ecosystem values and the rights and needs of indigenous peoples.*

The loss of these critical cultural and food sovereignty species is by itself a longstanding unjustified infringement and significant adverse cumulative effect on Okanagan Nation rights under Section 35 of Canada the *Constitution Act*.

Compounding cumulative impacts on fish and fish habitat in Canada, in 1964, the Columbia River Treaty[21] accelerated damming projects along the Columbia River in the United States and Canada. In Canada, the Columbia River mainstem was first impounded by the Hugh Keenleyside Dam near Castlegar in 1968. This was followed by the Mica Dam north of Revelstoke in 1973, and then by Revelstoke Dam in 1984. Of the latter, Lindsay (1994, 2-3) suggests:

> *The last, and probably most significant, impact on Arrow Lakes fish stocks was the construction of the Revelstoke Dam in 1984. This dam flooded 150 km of the mainstem Columbia River and 200 km of tributary streams which were used by Arrow Lakes kokanee, bull trout, and to a lesser extent, rainbow trout.*[22]

[21] See Section 4.3.2.1 for more details on the Columbia River Treaty and its implications for water and landscape.

[22] Lindsay (1994) goes on to suggest that Arrow Lakes flooding and Revelstoke Dam led to the following changes in Arrow Lakes: an “almost complete eradication” of yellow finned rainbow trout, radical reduction in smaller rainbows, and reductions in bull trout and their spawning habitat, among other impacts.

5.3.2.1 Impact Pathways on Fish During the Hydro Era

The following impact pathways, among others, are felt by fish in Okanagan territory, primarily as a result of hydro-electric dam development:[23]

1. **Reduced or lost fish passage:** The construction of dams in the Columbia Basin within Canada provides multiple impassable barriers to upstream fish migration. Fish migration barriers influence reproductive success by blocking access to spawning tributaries, as well as genetic diversity of fish populations as a result of population isolation. Arrow Lakes' rainbow trout, bull trout, kokanee, and white sturgeon (spawning and early rearing habitat) and Duncan Lake rainbow trout, bull trout and kokanee were directly impacted by fish barriers from dams. For example, it was estimated by BC Hydro and the BC Government that the Revelstoke Dam blocked some 500,000 kokanee, 1000 rainbow trout, and 4,000 bull trough from natural migration patterns. In total, eight of eleven BC Hydro dams in the Columbia Basin are thought to influence upstream fish migration (Utzig and Schmidt, 2011).
2. **Direct mortality via entrainment,** especially on smaller fish.
3. **Flooding and other impacts on critical habitat, including loss of spawning and rearing habitat:** The large new storage reservoirs (Kinbasket Reservoir for Mica, Revelstoke Reservoir, and a deeper set of Arrow Lakes) created by these dams also significantly reduced critical fish habitat (Lindsay 1994).[24] For example, the reservoirs have altered geomorphology at the mouths of tributaries so that in certain instances spawning migration of fish is restricted, preventing the use of spawning habitat by the species.
4. **Isolation of once connected intra-species populations:** In some cases (e.g., Salmo River bull trout), a downstream dam has isolated the population from historical connections to larger adult habitats, thereby increasing vulnerability.
5. **Increased risk of stranding:** Dams also artificially control the heights of water both upstream and downstream. If the altered stream mouth is dewatered during periods when juveniles are migrating downstream, a barrier formed at the same location could lead to stranding of out-migrants.
6. **Altered water temperature differentially affecting species:** Different fish species have different preferred temperature regimes. The cold water from Revelstoke Dam (~12-14 °C) is within the preferred range of bull trout, but white sturgeon require warmer water, particularly during spawning in mid summer (14-18 °C). These conditions are not available

[23] This overview is far from comprehensive: studies like Utzig and Schmidt (2011) do more justice to this topic, but even they recognize that data on impacts of BC Hydro dams in the CRB are limited: "This region (the CRB in Canada) contains a total of 43 fish species of which 27 are native to the area and 9 are endemic. In general, very little is known about the impacts on these relatively unstudied species. At the very least, a significant amount of river and stream habitat was inundated with dam construction" (Utzig and Schmidt, 2011).

[24] Lindsay and Seaton (1978, in Lindsay 1994, 2), suggest that the flooding of the Arrow Lakes eliminated 30% of the spawning and rearing habitat in the Arrow Lakes Basin.

to white sturgeon downstream of Revelstoke Dam and likely influence the recruitment failure for this species in the MCR. In addition, deep reservoirs create layering of waters of different temperatures, changing the productivity and distribution of species.

7. **Heightened exposure to predatory fish** at the water release point of the dam.
8. **Altered food web:** Altered vegetation and nutrient availability impacts upon which fish can do well in the ecosystem.
9. **Morbidity (reduced health) due to high total dissolved gas** at the water release point at the base of the dam.

These and other species-specific impact pathways from dams in the Columbia River in Canada are identified in Table 5.2 below.

5.3.2.2 Current Status of Fish and Okanagan Fishing in the Columbia River Basin

Please note that Okanagan Nation does not have access to adequate information to conduct a full characterization of change over time from pre-dam conditions in making these characterizations. This is one of the reasons we are calling for a full cumulative effects assessment for the Columbia River Basin, including reconstruction of a pre-industrial ecological conditions set, and associated detailed traditional use and traditional knowledge study with the Okanagan focused on the effects of cumulative change of dams in the Hydro Era on Okanagan fish and fishing-related indicators and rights.

Researchers have documented dam impacts for at least 24 of the fish species identified within the Columbia Basin. Some of the key status information and identification of dam effects on key harvested and culturally valued species in the Columbia Basin in Canada[25] are included in Table 5.2 below. Please note that only fish species likely to be present in the Rev6 Project affected-area are included in this list.

Table 5.2: Species-specific Impacts for Fish Found in the Columbia River Basin Area

Species	Type, Distribution, Conservation Status	Columbia Basin Dam Impacts
Bull trout (Salvelinus confluentus)	Present throughout Columbia watershed. Blue Listed (S3 Vulnerable) by BC CDC.	Habitat fragmentation, nutrients, food availability, extensive fluvial rearing habitat losses.

[25] Research includes by Utzig and Schmidt (2011), Arndt (2009a, 2009b), Cope (2009), Hagen (2009), Ladell et al. (2009), Porto (2008).

Species	Type, Distribution, Conservation Status	Columbia Basin Dam Impacts
Rainbow trout insectivorous	Indigenous to Columbia Basin.	Inundation of fluvial habitat, habitat fragmentation, nutrients, food availability, reduced turbidity.
Rainbow trout piscivorus	Indigenous to Columbia Basin.	Inundation of fluvial habitat, habitat fragmentation, nutrients, food availability, reduced turbidity. **Yellow Fin from Arrow Lakes considered extirpated.**
Kokanee (Oncorhynchus nerka)	Indigenous to Trout, Upper and Lower Arrow lakes. Introduced to Revelstoke Reservoir. Enhanced through stocking and spawning channels. Yellow Listed S5 (Abundant and Secure) by BC CDC.	Habitat loss (spawning) and habitat gain (lentic), habitat fragmentation, nutrient and turbidity changes, entrainment, and changes in aquatic-terrestrial interactions. Construction of dams expanded lentic habitat in the basin by approximately 700 km^2, including new reservoirs and increased surface area in previously existing lakes.
White sturgeon (Acipenser transmontanus)	Two populations: Columbia River and lower Kootenay River to Bonnington Falls. Kootenay population through lower watershed to Kootenai Falls. SARA (Schedule 1). COSEWIC (Endangered). Red Listed by BC CDC. Conservation Framework Priority 2.	Recruitment failure prior to age 1+ is the primary issue of concern for Wild white sturgeon populations (non-hatchery) in the Columbia River is mainly comprised of older individuals and their populations are in decline because of the lack of recruitment of juveniles since the mid-1980's and mid-1960's respectively. Recruitment failure prior to age 1+ is the primary issue of concern. Changes in channel morphology, substrate composition, water depth and velocity, turbidity, altered temperature regimes, as well as the complete elimination of critical habitat at the dam site and lack of access to important habitats between dams are all considered to have an impact on sturgeon population recruitment success. In general, habitat quality, egg/fry survival and access to feeding areas (and reduced food fish populations) have been noted as negatively influenced by dam creation.

Species	Type, Distribution, Conservation Status	Columbia Basin Dam Impacts
Burbot (Lota lota)	Occur broadly within most large lakes, reservoirs and large rivers in the Columbia Basin.	Mixture of population increase, decrease and unknown associated with the various dam units. Loss of riverine habitat for spawning, incubation and rearing, blockage of movement (habitat fragmentation), loss to the dam unit through entrainment, and productivity impacts associated with nutrient retention and/or water quality. At the juvenile stage they have some vulnerability to stranding within the littoral zone of lakes. Concern with habitat fragmentation leading to a long-term decrease in genetic diversity.
Mountain whitefish (Prosopium williamsoni)	Found throughout Columbia Rivers. Yellow Listed S4(Apparently Secure) by BC CDC. Conservation Framework Priority 4.	Habitat fragmentation, fish entrainment, water quality (temperature, dissolved oxygen, total gas pressure), fluvial habitat loss
Pygmy whitefish (Prosopium coulterii)	Widely distributed throughout Columbia Basin lakes. Yellow Listed (S4S5 secure, widespread, abundant, secure) by BC CDC.	Habitat Fragmentation, fish entrainment, water quality. (temperature, dissolved oxygen, total gas pressure), fluvial habitat loss
Westslope cutthroat trout	Isolated populations above barriers in upper Columbia River system.	Habitat loss, habitat fragmentation, and fish entrainment.
Longnose sucker	Distributed throughout Columbia. Normal and dwarf populations.	Habitat loss, habitat fragmentation, fish entrainment.
Largescale sucker	Widely distributed throughout Columbia River system.	Habitat loss, habitat fragmentation, fish entrainment.

Of course, impacts on fish extend over to impact on Okanagan fishing; as the distribution, abundance, type of fish, and population health of fish alter, so too does the success and enjoyment of fishing alter. These alterations are especially troubling when it is recognized that traditional knowledge of a natural distribution of resident fish species, built up over millennia, is quickly and possibly inexorably altered by human control over the hydrological system.

The loss of salmon has interrupted the ecological integrity and health of the landscape that invariably defines the culture, spirituality, and identity of the Okanagan and the Columbia Basin region's other Tribes and First Nations (U.S. Columbia Basin Tribes and Canadian First Nations 2014).

For the Syilx people, the loss of salmon translated to an emotional, spiritual, nutritional, and cultural loss, "a loss of connection, confidence, spiritual guidance, and self-worth" (US Columbia Basin Tribes and Canadian First Nations 2014, 6). Furthermore, the decimation of salmon stocks had detrimental impacts to the Syilx traditional diet, which resulted in a reduction of health, increased mortality rates, and higher rates of poverty (Meyer Resources 1997). With the destruction of salmon runs, Syilx people lost their traditional economic activity and trading opportunities, forcing an assimilation to wage labour. Social, economic and cultural impacts to salmon-dependent Syilx included the loss of social exchanges, family activities, kinship networks, and community cohesion.

5.3.2.3 Discussion of Cumulative Effects to Date on Syilx Fish and Fishing Valued Component

Alterations to a variety of Syilx fish and fishing indicators have occurred as a result of the above-noted changes since contact, and especially in the Hydro Era.

At the localized level in the Rev6 Fish and Fishing LSA, there are major existing adverse cumulative effects on most if not all Okanagan fish and fishing indicators, in the vicinity of the Dam upstream, and in the MCR, and these extend further into the Upper Arrow Lakes downstream. At the RSA (territorial) level, food security and access to salmon, at minimum have been subject to major adverse cumulative effects. All of these cumulative effects to date exist right up to the present day.

Syilx people once relied on Salmon, Lingcod, Kokanee, Trout, Squaw fish, Sturgeon and other species from the Columbia River for our survival. The health and abundance of these species has suffered as a result of industrial development in the Columbia River basin. The contribution of fish to Okanagan food security declined most precipitously with the effective extirpation of salmon in the Hydro Era. As a result and ever since, we have less options and a lowered chance of feeding our families on a regular basis with fish, once our primary staple.

Okanagan members also report that their practice of fishing has declined as there have been constraints placed on this once freely practicable and invariably successful activity. Syilx concerns

with regards to fish and fishing in the Upper Columbia were identified by the members of the Rev6 Project Review Committee at a Workshop in 2016. They include:

- Declines in this traditionally abundant resource for food security, and associated reductions in harvesting success;
- Loss of access to fishing sites; and
- Increased competition from tourism and sport fishers.

Overall, 51% of OKIB respondents reported fishing in the past year (The Firelight Group 2016). This, of course, would be an unheard of low number back in the time of salmon, and reflects a vastly reduced level of engagement in fishing by Okanagan members; linked to the factors noted above which have reduced enjoyment, access, safety, and success of this most Syilx of activities

Alterations to water levels and flows have reduced and changed the distribution of fish and fish habitat throughout the Columbia River Basin, with extensive (in some places complete) losses in salmon and other preferentially harvested fish species, and changes to the water regime have also served to reduce the attractiveness and perceived risks associated with harvesting from the Columbia River, especially in the dammed areas (both upstream and downstream of the dams). Competition by sport fishers, among other negative factors, has also reduced the ability to actually catch fish.

In addition, the ability to trade fish with other Tribes and First Nations has largely been hugely impacted, due to both loss of the fish themselves, and Crown controls over trade (Okanagan Nation Rev6 Project Review Committee Workshop; November 18 2016). Fish, once one of the principle units of “currency” in inter-tribal trade, have that status no longer.

Overall, Okanagan fish and fishing-related rights have been subject to multiple constraints over time since contact, have not been respected by settler culture, BC Hydro and the Crown in many instances, and despite recent strong efforts at retrenchment, are still in a pre-existing state of serious constraint in the pre-Project Case. It is into this already highly adversely altered fish and fishing context that the Rev6 Project is proposed.

5.4. Revelstoke 6 Project Effects on Okanagan Fish and Fishing Values

Please note: Initial draft materials on operation of the Project and impacts on fish and fish habitat are discussed here; the technical information is primarily from BC Hydro and still to be subjected to technical examination between the parties. Final BC Hydro EAC application

materials are required in order to complete this impact pathway assessment, especially on Okanagan fishing-related rights.

This section estimates the degree to which the Rev6 Project will affect Okanagan fish, fish habitat and fishing values.

5.4.1 Potential Impact Pathways of the Project on Syilx Fish and Fishing Values

5.4.1.1 Potential Impact Pathways Identified by BC Hydro

At the dam site, the proponent has stated that Project operations are expected to "produce the following changes in Revelstoke Reservoir with the resultant potential biological effects:

- Changes in the frequency and magnitude of daily water level fluctuations could affect aquatic primary production in the littoral zone, the distribution and abundance of macrophytes, and fish stranding risk.
- The increased maximum unit capacity of Revelstoke Dam could decrease residence time, and therefore, affect pelagic production by reducing time water, and thus nutrients and plankton, are available to the photic zone.
- The addition of Unit 6 would increase the number of units through which fish could be entrained. This could alter the number of fish (kokanee) entrained and their mortality rates." (SNC-Lavalain 2016e, 57)[26]

According to SNC-Lavalin, the effects of increased discharge capacity on pelagic productivity it was found that there was a 5% difference between the base and project case, but "this is not expected to affect pelagic production given the magnitude of change and other contributing drivers to production" (2016e, 59). There are many factors that contribute to change of pelagic productivity in addition to increased discharge and current dam operations, including stratification, wind driven events, Mica dam discharge, etc. Not understanding the contributing factors of each of these processes to decreased pelagic productivity is an information gap that needs to be filled in order to be able to characterize effects of Rev6.

In the MCR, the proponent has stated that operation of the Project is expected to produce the following changes and resultant potential biological effects (all from SNC-Lavalin 2016e, 60):

[26] "Kokanee populations accessing the MCR are largely controlled by conditions in the Arrow Lake Reservoir (ALR). Entrainment of age 0+ kokanee from Revelstoke Reservoir can be high (see Section 4.2.2.2.3); however, the effects of that contribution to the MCR and ALR are unknown." (p. 46)

- An additional unit could increase production of Total Dissolved Gas downstream with possible adverse effects on fish (i.e., gas bubble trauma) via operation or a change to spill risk.
- A reduction in duration of discharges between 850 and 1,699 m^3s^{-1} could affect White Sturgeon larvae survival by limiting dispersal in years when Arrow Lake Reservoir (ALR) is low (i.e., <434 m).
- Increased maximum discharge to 2,633 m^3s^{-1} (an additional 510 m^3s^{-1}) will alter channel velocities and could adversely affect availability of fish habitat, energetic demands of fish, or primary production through increased scouring of periphyton.
- Increased duration of discharge between 1,699 and 2,124 m^3s^{-1} will alter channel velocities and could adversely affect availability of fish habitat.
- Changes in discharge duration could alter channel inundation duration and magnitude enough to adversely affect primary production through reduced submergence or decreased light.
- Increased maximum discharge could increase wetted area and increase fish stranding risk.

Despite identifying the above noted impact pathways, BC Hydro has determined negligible effects on fish and fish habitat in the MCR. Further, the assessment completed by BC Hydro does not investigate the effects of lower water temperatures in the MCR and the impact this has on white sturgeon larvae survival. This effects assessment underestimates the magnitude of impacts the project will have on Fish and Fishing in the LSA. Reasons for this suspected underestimation include:

- Effects of change in water temperature are not evaluated as part of the assessment. The current operations of the Revelstoke Dam make for lower temperatures in the MCR impacting white sturgeon larvae survival. White sturgeon are a red-listed SARA species with very few intact remaining spawning areas. The additional discharge in the Rev6 project case will contribute to the low temperatures at the only known sturgeon spawning ground in the Columbia River (adjacent Revelstoke Golf Course, a few kms downstream of the Revelstoke Dam).
- In November 2016, the Proponent revised erosion modelling at 39 archaeological sites within the MCR and found that scour and lateral erosion at 15 sites is expected to experience and increase in site erosion risk based on the new modelling. The findings of increased erosion risk need to be applied across all VCs, especially Fish and Fish Habitat.
- The current baseline is heavily impacted. Incremental project effects could in fact represent the tipping point for endangered fish species such as sturgeon.

From an Okanagan perspective, each of the impacts highlighted above affects water, fish and fish habitat and therefor our ability to exercise our right to fish in the Revelstoke Reservoir, the MCR and Upper Arrow Lake.

5.4.1.2 Additional Potential Impact Pathways on Fish and Fishing Identified by Okanagan

BC Hydro indicated it would be reliant on affected First Nations to identify actual impacts on traditional uses such as fishing, in Part C materials. Based on the information available at the time of drafting of this Part C Report, the Okanagan Nation has identified the following additional potential biophysical and rights-related impact pathways on Okanagan fish and fishing values in relation to the Rev6 Project:

Reduced ability to enjoy Okanagan territory: Construction associated with the generating station will affect peoples' ability to enjoy the territory as a result of associated construction noise, equipment and personnel in and around the site in question.

Reduced access to preferred fishing sites and increased safety issues on the water: The water levels in the Upper Columbia River are largely mechanized as a result of the dams. Syilx member express that they are not able to navigate the waters during most times of year because of high levels of water fluctuation throughout the day. People fear that their boats will be dried and stranded.

Reduced fishing success in the MCR: changes to operations associated with the sixth turbine, will impact spawning grounds of Sturgeon and other fish species further decreasing the return on effort for any fishing activity in the MCR or Arrow Lakes.

Further, increased velocity from higher discharge rates will exacerbate substrate movement (boulder, cobble, gravel, sand, etc.), with impacts to macro and micro interstitial habitats downstream, as well as colonization of primary (algae) and secondary (benthos/invertebrates) production.

Reduction in the distribution and abundance of preferred and culturally important fish species: the construction of Rev6 will increase bank incisement, erosion, turbidity and maintain low temperatures in Upper Arrow lake, affecting the ability of Sturgeon and other preferred fish species[27] to reproduce. Currently there are no considerations for fish passage at Revelstoke Dam. Many culturally important fish species (sturgeon, bull trout, kokanee, rainbow trout, mountain whitefish, largescale and longnose sucker, burbot) migrate through the Columbia River to

[27] Preferred fish species include but are not limited to: kokanee, whitefish, salmon, trout, sturgeon, sucker fish, and eel. As previously discussed the health and abundance of these species has suffered as a result of industrial development in the Columbia River basin.

Revelstoke Reach or are entrained by Revelstoke Dam and have no means of moving upstream from the Dam site.

Concurrent aboriginal (and basin-wide, non-aboriginal stakeholders) interests include reintroduction of anadromous fishes (i.e., salmon) throughout their historical range including upstream of Revelstoke. Lack of action on fish passage at Revelstoke Dam pushes this aspiration further from reach.

Reduced food security: The project case introduces multiple negative effects to the ability of fish to thrive in the Revelstoke Reservoir and the MCR. As Okanagan people have traditionally relied heavily on fish to achieve food security, it is clear that any further effects to fish will also negatively impact Syilx food security.

5.4.2 BC Hydro's Committed-to Mitigation Measures to Reduce Impacts to Fish and Fish Habitat

As BC Hydro has identified that the level of effect of all project interactions with the Fish and Fish habitat VC are negligible and that there are no potential adverse effects, they have not proposed any mitigation measures. Also note that BC Hydro has no materials on fishing itself and thus no recommended mitigation to this end. We disagree with this finding, and as a result, mitigation is required.

BC Hydro says that entrainment of kokanee and other fish populations is a persistent issue resulting from Revelstoke Dam operations and is being mitigated by the Mica-Revelstoke Fish Entrainment Strategy. However, BC Hydro has not provided any documentation as to the effectiveness of this mitigation. BC Hydro does not believe that increase in discharge capacity in the Project case would lead to measurable risks on the kokanee population (SNC-Lavalin 2016e, 59).

Given the lack of offsetting improvements (e.g., fish or fish habitat offsetting measures) identified by BC Hydro in relation to the Project, it can be expected that indicators such as extirpation of anadramous salmon will continue. This lack of offsetting benefits is especially troubling in light of:

- The clearly significant pre-existing cumulative adverse effects in the Revelstoke Dam, MCR and Upper Arrows Lakes areas, for fish, fish habitat, and First Nations fishing; and
- The important role that BC Hydro has played in these existing damages and infringements.

Please note: Okanagan Nation and BC Hydro have not yet met to discuss required mitigation to reduce potential adverse effects from the Project, alone and in combination with cumulative effects causing agents (including prior BC Hydro actions). At any such meeting BC Hydro is invited to identify additional mitigation it believes will successfully avoid, reduce or compensate for impacts on Okanagan fish and fishing-related values, indicators and rights.

Okanagan Nation will reserve judgment on assessment of Project-specific or total cumulative effects in the Project Case can occur until information and mitigation gaps are filled – such assessment and any discussion of it is premature at this time.

6. Okanagan Culture

This section focuses on the foundational elements of Okanagan culture that are central to our way of life, what is required to ensure the continuity of Okanagan culture, how these cultural values have been affected to date after contact, and effects on Okanagan cultural values that may be expected from the proposed Rev6 Project.

Pre-existing cumulative and potential Project-specific effects on water, fish, and other resources that underpin Okanagan culture, are discussed in Sections 4, 5, and 7 of this report, respectively. This section focuses on the foundational values of Okanagan culture that are central to our way of life and associated indicators, and what is required to ensure the continuity of Okanagan culture.

And this Okanagan cultural continuity is at great risk. A multitude of changes imposed upon the Okanagan people over time since contact, including many Crown decisions and actions of BC Hydro, have extensively reduced cultural continuity factors for our people, to the point now where our language, way of life on the land and waters of our territory, and even what it means to be Okanagan are under active threat. In recent years the Okanagan have made strides to protect our culture, but substantial residual impacts and ongoing threats remain. Only through proactive redress for cultural[28] losses can the cultural continuity of our people be maintained and enhanced into the future.

Please note: A full consideration of Project-specific effects and total cumulative effects in the Project Case cannot be completed until: a. BC Hydro fills information gaps in the assessment materials it has provided Okanagan to date; and b. the parties meet regarding mitigation requirements.

6.1 Introduction

Given the diversity of its meanings and elements, culture cannot be exhaustively defined. For the purpose of this baseline and trend-over-time assessment, culture is the intangible (i.e., non-physical), semi-tangible and tangible set of values, objects, mode of communication, body of knowledge and information that is transmitted within and between generations in a defined human population group, in this case the Okanagan (Syilx). This includes the practice and knowledge of values, norms, and laws, ceremonies, relationships (between people and the environment), beliefs, spirituality, and more.

[28] The terms “cultural” and “culture” are used synonymously in this report.

Okanagan culture is rooted in place in our traditional territory (shown in Figure 2-1), as well as the land and water and the resources they provide, and the physical and intangible records of our history (such as archaeological sites and oral accounts, respectively). Physical heritage resources such as archaeological and burial sites and other tangible aspects of natural resources are an inseparable part of culture, but alone provide an incomplete depiction of Okanagan culture. Culture is reflected and embedded in the relationships between our people and their natural environment.

6.1.1 Beyond Archaeology: The Case for an Expanded Definition of Culture in Assessment of Effects on Okanagan

BC Hydro's Application does not assess for the semi- or intangible aspects of culture. The Proponent's draft Section 7 (Part B: Heritage Effects Assessment) is limited in scope, being based almost exclusively on the requirements outlined in the BC *Heritage Conservation Act*. Heritage resources by this interpretation are limited to archaeological sites that pre-date 1846, whether they are disturbed or intact, and to post-1846 sites such as:

- Aboriginal rock art with historical or archaeological value;
- Burial places with historical or archaeological value; and
- Sites of unknown attribution that could have been occupied prior to AD 1846.

The approach taken by BC Hydro in Section 7 of its draft Part B materials for the Application does not consider the vast majority of evidence that demonstrates Okanagan heritage and culture across our territory, including the Project area (e.g., culturally important places and landscape features that left no lasting physical record or occurred after 1846). As recognized in the cultural impact assessment literature, "cultural resources" extend beyond the physical, including but not being limited to "culture holders' shared history and experiences, knowledge of the land and resources, and ways of knowing and transmitting knowledge" (Gibson *et al.* 2011). More specifically in the instance of Rev6, while the Proponent's draft Section 7 of Part B considers physical archaeological resources, not included are many intangible and semi-intangible cultural values, including but not limited to:

- Special places that may not have built components such as spiritual, historical, ancestral, gathering, and harvesting sites;
- Places of cultural practice and part of land use patterns such as subsistence harvesting, travel, and crafting, among others (i.e., "traditional use");
- Cultural landscapes[29] that are reflective of Aboriginal culture containing valued physical and non-physical characteristics tied to sense of place, history, and identity, etc.; and

[29] Cultural landscapes have been defined as "landscapes that are lived in" and which bring attention "to the way people within the landscape live, their traditions and everyday life" (NWT Cultural Places Program (2007)). Even

- Cultural values, knowledge, customs, and systems including spiritual beliefs, traditional dances, songs, and pastimes, laws and norms, language and oral history, arts and games, relationships to the environment, traditional knowledge, and intra- and inter-generational relationships.

It is important to recognize that the above cultural dimensions are not easy (and in some cases, impossible) to separate into discrete “silos” for the purposes of effects assessment. Individual sites may fit several value categories, and cultural value may not be rooted in one place. In addition, an effect on one or more aspect of culture may have ripple effects across the spectrum of values and can extend into other realms such as community well-being. For many Okanagan people, their culture is the foundation of their personal identity, and the values, beliefs, knowledge, skills, symbols and activities that are built into their culture provides the “glue” for their well-being and connection to other members of their community and culture group; without it, their well-being may be at risk (see also Section 8 discussion of the effects of loss of connection to territory on Okanagan well-being).

Adopting a holistic perspective on potential cultural impacts from the Rev6 Project in combination with cumulative effects on culture is thus essential, especially as the land itself is often a key repository of knowledge, an interpretive tool, and a key locator of meaning and history for Okanagan people. The importance of a place may extend beyond the physical; the visually archaeologically observable and recordable evidence of cultural use and utility is the proverbial “tip of the iceberg”. Proper assessment of culture by necessity must include consideration that impacts on culture can come not only from changes to “things you can touch,” from physical effects on tangible, visible heritage resources, but also they can also come from changes to “things that touch you,” from the intangible cultural resources that are experienced from within and are vital to culture holders.

As a result, to conduct a “heritage” assessment solely on the physical archaeological evidence from before 1846 is far from adequate to understand the potential effects of the Project on Okanagan culture. Rather, an understanding of both tangible and intangible resources and the already sensitive state of all cultural resources is necessary to comprehend the risk posed by the Project to Okanagan. To address this issue, and provide a more complete picture of Okanagan culture and associated Project-related risks, this section provides, in sequence:

- an overview of Okanagan values, laws, and norms and requirements for cultural continuity as established prior to contact;
- consideration of cumulative effects to date on Okanagan culture; and
- identification of anticipated Project-specific effects pathways on the Okanagan Culture VC.

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where there are no visible signs of human usage, there may be historic events, hero and creation stories, or significant usages of an area.

6.2 Setting the Context: Okanagan Cultural Values and Indicators

Okanagan culture was selected as a VC due to its overarching importance to the Okanagan Nation.

6.2.1 Key Indicators of Okanagan Culture Values

Table 6.1 identifies key indicators linked to Okanagan cultural values, rights, laws, norms and guiding principles, as identified by Okanagan Nation representatives.

Table 6.1: Key Indicators for the Okanagan Culture VC

Valued Component	Key Indicator/Measurable Parameter
Okanagan Culture	• The ability to meaningfully practice and pass on Syilx laws and traditional knowledge as they relate to traditional cultural practices (dance, song, language, arts, place names, ceremony, etc.) • Ability to practice Syilx laws of stewardship and responsibility- tmix^{w} and tmx^{w}ulax^{w} • The ability to protect and respectfully manage burial and other archaeological sites • The ability to navigate a changing landscape and changing place names- the connection between land and language

Laws, norms and guiding principles are effectively three of the indicators above, and rights related to stewardship are explicitly in the second indicator.

6.2.2 Attributes of Pre-Contact Okanagan Culture

> *"To Syilx people culture is belief in respect and respect in belief"… Everything is connected, everything has a purpose and a reason for being; therefore, everything must be and is treated with respect.*[30]

While Section 2.4 examines some of the key Okanagan cultural values, it would be impossible to fully characterize the complexities of Okanagan culture that had built up over the millennia prior to contact. The focus in this section is on the status of the above-noted Okanagan cultural indicators prior to contact. These indicators are identified in bold text in the discussion below.

[30] www.okanaganfirstpeoples.ca/culture.cfm

The ability to meaningfully practice and pass on Syilx laws and traditional knowledge as they relate to traditional cultural practices was well entrenched and fully functioning prior to contact. The values, laws and norms that form the basis of Okanagan culture were found in oral histories and stories. Okanagan values, laws and norms detail the appropriate and sanctioned relationships between people and between people and the natural environment; they have been transmitted between teachers (e.g., elders) and students (e.g., youth) for generations and guide our day-to-day lives and actions.

Teaching of Okanagan's values, laws and norms and teaching as an act are also foundation elements of culture. In particular, lessons on how to relate to the environment and community are emphasized:

- Passing on ways which are respectful to all creation (e.g., sharing, respect, always telling the truth, using all parts of the animal or plant, not wasting anything, leaving things the way you found them, such as the land and water);
- Practice of ceremonies, especially around gathering of traditional foods – "Berry pickers, root pickers and hunters give some of what they have gathered in prayer as thanks and for the ability to gather the upcoming year" (Okanagan First Peoples 2008d, 2); and
- Teaching responsibility to one another, to be a healthy part of the whole family and community, and raising children to grow up understanding respect for nature and community.

Ability to practice Syilx laws of stewardship and responsibility- tmix^{w} and tmx^{w}ulax^{w} was long entrenched and fully functioning prior to contact. These laws included but were not limited to:

- The right to manage forests through prescribed burning and stand management;[31]
- The right to self-governance, independence, and ownership of our lands, territories, and customs as the basis for the preservation of our knowledge;
- The right to exclusive ownership of Okanagan intellectual and cultural property, and control over the dissemination of such property and knowledge;
- The right to decide how the lands, waters and resources can be used;
- The right to manage the lands, waters and resources; and

[31] "... we hold traditional ecological knowledge, passed over generations, for how to care for the forests on our territories. For example, Okanagan people have knowledge about the technology of controlled burns to take care of the forests. We know, for instance, that if the natural burn cycle did not burn an area periodically, a severe overgrowth would occur that discourages certain kinds of understory plants that we use, like berries or medicines, and diminishes certain kinds of animals or smaller birds that rely on berries, grasses, or other plants. Our people would set controlled burns to control the overgrowth in the forests. Knowledge about what time of year, how to read the natural wind cycles and air pressure cycles at different times of the year and different times of the day so the burns do not get out of hand or cause problems were important areas of knowledge that our people knew as part of our responsibility to take care of the forest." (Armstrong 2007)

- Equal sharing in work and its benefits.

The ability to protect and respectfully manage burial and other archaeological sites was well established through cultural laws and norms prior to contact as well. Burial sites were subject to specific cultural rules, and what would today be considered archaeological sites were very often either active seasonal homes or gathering places for harvester groups (and used as such), or important and well known spiritual sites, celebrated in stories and protected via culturally imposed rules.

The ability to navigate a changing landscape and changing place names- the connection between land and language: For Syilx, the land itself is often a key repository of knowledge, an interpretive tool, and a key locator of meaning and history. In Okanagan culture, the stories, knowledge, and practices that are critical to living well are transmitted while people are out on the land engaged in the traditional economy as they pick berries and plants, hunt, trap and fish. In our oral societies, historical and mythological events are often recorded in landscape features. As young people travel on the land, they engage with their elders, leaders and families, strengthening their bonds and knowledge as they come to know their history through storytelling at the significant places to their community. The shared stories ensure that the younger generation acquires appropriate cultural information about traditions, worldviews, spirituality and values.

This intricate connection was not constrained at the time of contact. Both within and between groups, including Syilx and other neighbouring and trading First Nations groups, the natural landscape was well known and travelled on the basis of collective memory of directions and landforms, with the memory aid of place names for particular locations. The cultural landscape of Syilx was well named and well known through Captikʷɬ: “land forms in the stories are teachings and are reminders to each generation” (Armstrong *et al*. 1994, 2). Prior to contact, there were minimal if any threats of a “changing landscape”, given the minimal footprint of indigenous groups on the land. Major alterations to the visual cues used for travel were rare and typically from natural causes (e.g., forest fires).

6.2.2.1 The Critical Importance of Sense of Place and Connection to Territory

Overall, Okanagan social and cultural well-being is intertwined with that of the environment and the land from which Okanagan members’ identities are derived. The Okanagan and all aspects of the natural environment are effectively one and the same – relatives in the true sense of the word:

> *The rights that we have, to hunt to fish to pick berries and dig roots is not something that was handed to us on a piece of paper that was given us a right to do that ... the right comes from the animals themselves. To us they’re our parents – those 4 kingdoms, the four leggeds, the water creatures, the flying creatures and the plants with their roots. Those are our parents. Piece of each*

> *one of them is where we come from. Piece of the four legged, piece of the water creatures ... flying creatures and the plants with their roots. (Armstrong 2015, 15)*

Although natural resources were managed and also highly valued for their functional utility, whether as food, medicine, or for shelter and tools, fundamentally the environment was – and remains today – of great spiritual importance to the Okanagan. Animals and plants themselves are considered spiritual beings, and are prominent in Okanagan mythology:

> *All plants, particularly those important as foods and medicines, were regarded with the utmost respect and reverence. Like animals, they were believed to have souls or spirits, and in the early days of Okanagan-Colville mythology they were attributed human features. Many Okanagan-Colville legends refer to plants in their original state and describe the circumstances of their transformation to their present form. Thus, black tree lichen was originally Coyote's hair, and clematis the braids of a maiden owl. Tamarack was a man-eating monster. (Turner et al. 1980, 152)*

In addition to the spiritual importance of the resources that are found in the Arrow Lakes region, the area contains sacred landforms, knowledge of which has been passed down through the generations through stories and while traveling the area (Baptiste 2016).

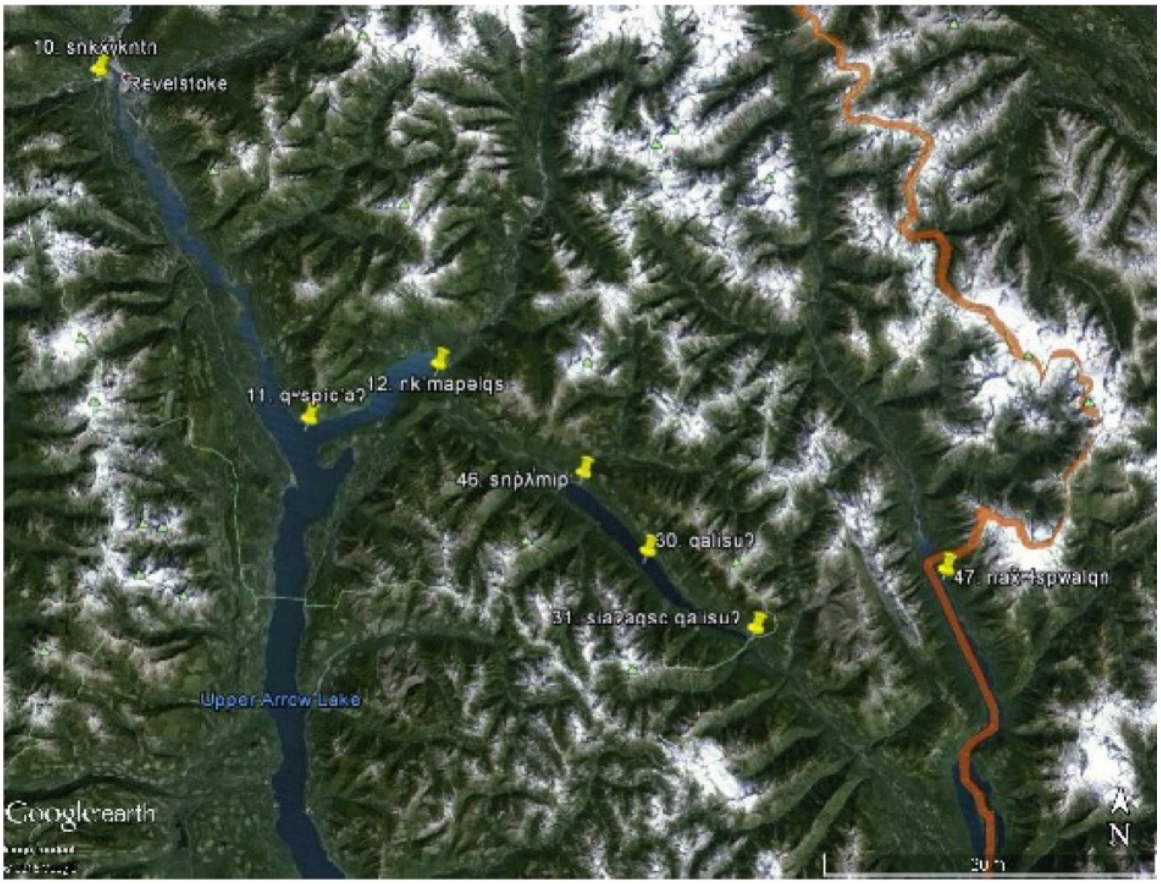
> *In the area of the Arrow Lakes there were sacred land forms created by Coyote to ensure that the Syilx people would forever remember. Visual and oratory evidence of these land forms were identified through the – captikʷɬ – stories told by the people. Wherever their travels took them across the land the people brought attention to these land forms. The journeys and stories told for hundreds of thousands of years to thousands of generations of people were always about identity. These are just a few things mentioned that helped and kept the land laws and histories alive and well. Each story put forth by eloquent renowned orators story tellers chiefs and leaders maintained the identity of the Syilx people and their ties to the land and water. All of which guaranteed that living along the great shores of the Arrow Lakes was a harmonious existence for all. (Baptiste 2016; see Appendix 1)*

Okanagan sense of place is also rooted in the knowledge and history of the territory, memories of personal and ancestral experiences (as told through oral histories), and the presence of familiar and valued place characteristics (e.g., the presence of a certain species at a certain place and time, a place name, a topographic feature, etc.). Places of importance were often given place names that reflect the diverse history and heritage of the Okanagan Nation:

The Okanagan people gave names to places throughout their territory to identify the land they know so well, and with which they have a strong spiritual connection. For centuries, these names that describe the natural features of the land, or commemorated significant historical events, passed from one generation to the next. (ONA 2006, 10).

Figure 6.1 (below) offers a non-exclusive visual of some Okanagan place names in the MCR, Beaton Arm and Upper Arrow Lake.

Figure 6.1: Example Okanagan Place Names from Revelstoke to Trout Lake



The telling of stories, free travel through the territory, and the ability to access resources and the territory thus reinforce and sustain Okanagan cultural identity. Changes since contact to this Okanagan sense of place, alongside the above-noted cultural indicators, are examined in more detail below.

6.3 Cumulative Effects to Date on Okanagan Culture

The ability of the Okanagan to practice and maintain their governance systems and natural laws, to pass on knowledge and customs, to travel the land and access resources, and to protect and preserve heritage sites and sense of place have all been severely eroded since contact, with these impacts being exacerbated in the post-1930s Hydro Era. This section identified elements of Okanagan culture that have already been cumulatively impacted in the pre-Project condition. This erosion has rendered the current condition of Okanagan's cultural and heritage resources much more vulnerable to further disturbance.

6.3.1 Hydro Era Effects on Okanagan Culture (1930s to Present)

Among the factors impacting Okanagan culture during the early contact period (discussed more in Section 2.4) were the implementation of the reserve system, the creation of the US/Canada border splitting the Syilx Nation, disease radically reducing Syilx population, colonial agents indirectly or actively interfered with Okanagan governance, and the effects of residential schools.

Despite these changes, Okanagan culture persisted. However, the alienation of the Okanagan from their territory and disruption to their way of life (e.g., ability to practice stewardship laws and transmit knowledge of traditional livelihood practices) has continued into the 20th and 21st century, with negative contributions from large-scale infrastructure projects, especially hydro-electric dams.

In particular, as noted by BC Hydro in its draft Part B materials for Rev6 (Section 7.2.2.3.1 – SNC-Lavalin 2016), the Mid-Columbia River (MCR) Valley:

> *... has been extensively altered by the construction of a series of dams on the Upper Columbia River. The Mica Dam, Revelstoke Dam, and Hugh Keenleyside Dam have resulted in the creation of the Kinbasket, Revelstoke and Arrow reservoirs, the last being of specific concern to the current project. Prior to the creation of the reservoirs the subject portion of the Upper Columbia River consisted primarily of a braided river channel, except in the south end of the study area, which consisted of the northern end of pre-dam Upper Arrow Lake including Beaton Arm.*

As a result of these and other dams such as the Grand Coulee Dam in Washington State in 1941, the Columbia River ecosystem has been drastically altered. Notably, the key cultural species of salmon were blocked from returning to BC, adversely affecting Okanagan's way of life (Columbia Basin Watershed Network and Living Lakes Canada 2013).[32]

[32] Refer to Section 5 for more detailed examination of the effects of the loss of salmon.

The installation of numerous dams on the Columbia River and consequent inundation of large tracts of land also prohibited Okanagan access to highly valued hunting, gathering, and spiritual sites, not to mention archaeological sites and burials. As shown in Section 4.3.2.2, Utzig and Schmidt (2011) found that in the Columbia River Basin in Canada, more than 120,000 hectares of land have been subject to inundation from BC Hydro dams alone. To this loss of territory upon which to practice cultural activities must be added the following:

- Land lost due to physical BC Hydro infrastructure;
- The many hundreds of thousands of hectares of land alienated via other settler activities since contact (e.g., through agriculture, residential, transportation, mining, and forestry activities); and
- Land utility lost due to disturbance effects around settler activities and to safety and other perceived risk considerations.

The proliferation of dam infrastructure and associated impacts to the land and waterways has thus incrementally exacerbated Okanagan's ability to freely and safely access their territory. Disruption of river ecology (e.g., local loss of salmon), large-scale terrestrial inundation, and other environmental effects caused by the dams has also fundamentally altered key place features tied to generations of history, memory, and cultural practice that are essential to Okanagan's sense of place. For example the dams and resulting reservoirs have disrupted sacred places and traditions linked to oral histories:

> *Then the "Visitors" came to Syilx lands: and the dams happened. Each flood pool behind each dam devastated the land and buried the landforms and the laws beneath sediment and soil. The flooding water drown the Syilx footprints and homes. Their voices got eroded and erased too, by whirlpools of water, back eddies, and the raging river as it is caused to artificially rise and fall from the dam's operations. At the same time, in its wake, are the exposed ancient remains of Syilx and siʔxʷepmx people. Also as a result, we no longer are able to see, at the great Kettle Falls, where coyote had sat with his three pronged harpoon, and as the story goes, with one great thrust he bought the salmon ceremony and the protocols to shore there. (Baptiste 2016; see also Appendix 1)*

Many physical archaeological resources have already been lost as an outcome of damming the Columbia River, inundation of Arrow Lakes and Revelstoke Reservoirs, erosion by wind and water (including water fluctuations both upstream and downstream of the dams), and other destructive agents.

6.3.3 Cumulative Effects to Date on Okanagan Culture

Cumulative impacts have progressively reduced the ability of the Okanagan to ensure the continuity of their culture through the transmission of knowledge, language, and customs, and through the loss of access to abundant and healthy natural resources and valued places. Overall, the portion of the Okanagan cultural landscape that still holds the values necessary for peaceful enjoyment of lands and waters has declined precipitously since contact. These changes and change agents, and many others, have contributed to social dysfunction, economic marginalization, and cultural continuity decline for Okanagan people over time.

6.3.3.1 Current Okanagan Cultural Continuity Conditions

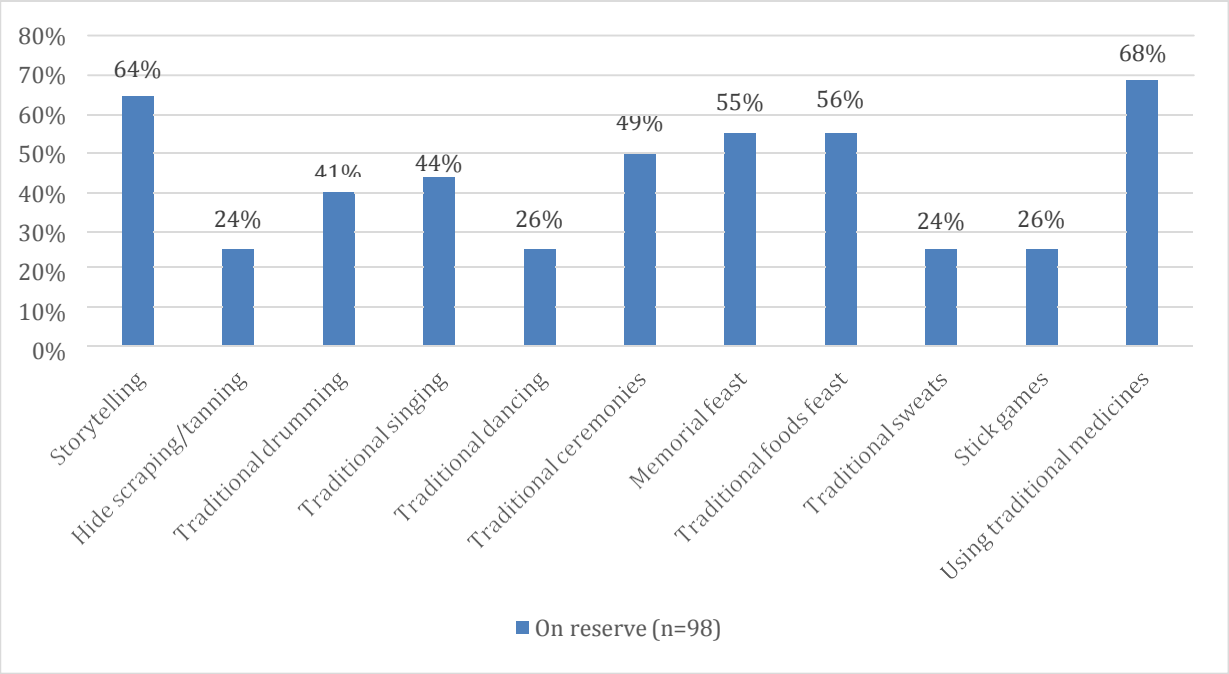
NOTE: No detailed studies of social, economic and cultural baseline and trend-over-time conditions have been conducted in relation to PIB or WFN. The information provided here is primarily from the recently completed OKIB Socio-economic Baseline Study; further information relevant to the two other Nations is required to paint a more accurate picture of the affected Nations overall. This data should be collected as part of ongoing work to establish an appropriate socio-economic baseline for these communities in Spring and Summer 2017.

Okanagan access to land and waters for cultural purposes (discussed further in Section 8 as a key factor in community well-being) has been subject to extensive, primarily externally imposed, reductions over time since contact, as described in further detail in multiple sections of this report. Despite strong recent efforts by Okanagan communities to retrench and renew their cultural and harvesting practices on the land, adverse effects of this disconnection on cultural continuity are still measureable and substantial.

Members' continued engagement in traditional foods harvesting, consumption and ceremony is critical to culture. Engagement in Syilx traditional harvesting and cultural practices helps to strengthen peoples' connections to their territory and their Syilx identity. The connections between individual and community health among indigenous populations to cultural practicability, connection to the land base and traditional way of life on the land, as well as the ability to pass on traditional knowledge are well studied (Ganesharajah 2009; Garnett and Sithole 2007).

An example measureable parameter of cultural well-being is Okanagan members' engagement levels in cultural activities. While data is not available for WFN and PIB, the results of the 2016 survey of OKIB members (Firelight & OKIB 2016) indicates that many Okanagan Nation members still engage in cultural practices, as shown in Figure 6.2.

Figure 6.2: Participation in Cultural Practices by OKIB Households



For example, events and festivities continue to occur annually around the Arrow Lakes, including the Canoe Trek as well as culture camps; gatherings connect people to the land, each other (ONA 2006).

These numbers are heartening, but it is important to note that prior to contact both the percentage of people involved in cultural activities (effectively 100%) and the frequency of cultural practices were much higher.

Engagement in Syilx cultural practices helps to strengthen peoples' connections to their territory and their Syilx identity. The importance of these connections was raised in a series of focus groups with OKIB members in October 2016. Central to keeping oneself in balance was to be activity engaged in Okanagan culture, knowing and following protocols and actively speaking/learning the language. As one member said:

> *to keep yourself in balance, we have sweathouses. My grandma Theresa made us go into the sweathouse in the morning before school. We went to pick berries. I can still hear her drumming….. Now I'm 63 and I remember a lot of it. We had to work hard. We had 2 gardens, our own vegetables. Now my grandsons play the drum. I can hear her singing. I sing. That's powerful. I still do a lot with our wakes and stuff. My kids aren't supposed to go outside when there is a body. There is a lot of protocols. We both come from a traditional background and to teach our grand nieces/nephews…. My grandson is 14 and he knows the language. And learning about this is important. (Firelight & OKIB 2016)*

Use of Nsyilxen language is another important, but currently extremely vulnerable, cultural continuity support factor identified by Okanagan members. Language revitalization is an important goal of Okanagan communities, as Nsyilxen is at high risk of being lost. Within the overall population of 6100 members, only 2% (146) are fluent speakers, 4% (225) have some understanding and just over 10% (649) are actively engaged in learning (First Peoples Language Map of British Columbia).

A central focus of language revitalization strategies among Okanagan Nations is the creation of a rich cultural environment and language programming from ages 0-12 in daycare and elementary school settings. For example, the Language Nest program, an all day program (9-3), has staff and Nsyilxen speakers providing a cultural immersion environment for children (aged 6 months to 4 years) and their parents. Nsilyxen speakers also provide daily language instruction for children enrolled in band culture immersion schools. Other proactive efforts include the creation of a cultural immersion environment within band schools and having Nsyilxen speakers within schools. Outside the school settings, cultural activities are a core component of health program such as the Prenatal Nutrition Program and Aboriginal Headstart, while the Territorial stewardship department staff, support culture camps on a yearly basis.

Despite strong efforts at cultural retrenchment, Okanagan culture is clearly still in a pre-existing and long-standing state of high vulnerability. Exposure to additional adverse effects on culture must be understood in this low resiliency/high vulnerability context.

6.3.3.2 Discussion of Cumulative Effects to Date on Syilx Culture

Negative changes have occurred on all four key Syilx culture indicators as a result of changes since contact.

The ability to meaningfully practice and pass on Syilx laws and traditional knowledge: Multiple factors over generations have alienated the Syilx from traditional cultural practices associated with much of the Columbia River Basin and Okanagan Territory in general. For example, the alteration of ecology, water flows and heights, and change in visual landscape (including inundation) has led to alienation from many important places and resources connected to specific ceremonies. One such example would be the Syilx salmon ceremony, which is no longer practicable on a regular basis as a result of extirpation of anadromous salmon from the Upper Columbia River. Access to land has also precipitously declined and the practice of culture reduced, both in geographic extent and frequency, despite strong Okanagan desire to connect to the land.

Ability to practice Syilx laws of stewardship and responsibility – tmix^{w} and tmx^{w}ulax^{w}: A variety of factors have led to an inability for Syilx to protect waters, lands, shorelines, fish and game, led by an influx of settlers and industry, and usurping of governance by the Crown. This has led to

a long-standing and still continuing breach of suxtem. Also, Syilx stewardship activities have been radically curtailed and largely stopped by Crown action.[33]

The ability to protect and respectfully manage burial and other archaeological sites: The effects of changing water and hydrological regimes on Syilx historical sites and ancestral remains are unacceptable. These are spiritual sites of great significance to our people and must be treated with the utmost respect. Fluctuating water levels continue to cause remains and artifacts to be unearthed and looted. As Syilx people, we have a responsibility to protect our ancestors and historical resources. However, decisions are now in the hands of the Provincial Crown, private landowners, and industry.

The ability to navigate a changing landscape and changing place names: Syilx laws and knowledge are tied to place. The waterways and landforms near the project area have already undergone significant change resulting from the construction of Revelstoke Dam, and other dams along the Columbia River. This has heavily impacted Syilx ability to practice traditional laws and pass on traditional knowledge related to the Arrow Lakes. Introduction of dams to the Columbia River system has significantly altered the landscape and natural hydrological flows. Sense of place has been altered by such developments. Many Okanagan place names have been lost or altered in meaning and many members have lost our language and captikwl to properly interpret the cultural landscape.

Cumulatively, settler physical works and activities have limited the amount, quality, and distribution of land available for the maintenance of Okanagan culture through barriers to access, privatization of land, irritants such as noise pollution and increased traffic, and physical disruptions such as built infrastructure and roads. Damage from industrial sources has and continues to disrupt the transmission of knowledge from elders to the next generations, and thus cultural continuity. Such effects also have psychosocial impacts including a general sense of alienation from traditional land, despair over the continuation of traditional culture over time, and the disruption of traditional family and community structures.

Actions by BC Hydro have played a key role. Dams and reservoirs, for example, have contributed to a loss of landscape and language, as noted by Derickson *et al.* (1994; in McKinney *et al*. 2016, 190-1):

> *The land is at the center of how we are to behave. The destruction of the story landmarks and natural land forms are like tearing pages out of a history book to the syilx. Without land knowledge we are endangered as a life form on that land and we in turn endanger other life forms there… Landscape is a way of passing on language, identifying traditional territory, and grounding cultures and systems*

[33] For example, Armstrong (2007, 9): “none of our Okanagan knowledge or laws, acquired over generations, is being reflected in the management of the forests on our territory”, for example controlled burning.

> *of governance to the place in which it exists. If landmarks have disappeared, then people lose the ability to pass that information down to future generations.*

Ultimately, Okanagan culture irrevocably changed when compared to the period prior to the damming of the Columbia River, and certainly when compared to pre-contact.

> *Visitors to the land of the Okanagan today are hard pressed to observe at first hand even the vestiges of traditional Okanagan society and culture. In the first place the majority of the people… live on the small parcels of land reserved for them by the governments of British Columbia and Canada between about 1861 and 1876 onwards. In the second place they control neither their political nor their economic destinies, while the formal education of their children and the ministering of 'approved' religion have been in the hands of non-active institutions for well over one hundred years. Superficially speaking, the Okanagan of today appear to have lost not only their territory and their power to control that territory, but also their cultural and structural identity. Their language is not dead, but few people speak it. There are few vestiges of traditional material culture. There are no war parties, no summer camps, nor apparently many of the manifestations of the old culture. (Carstens 1991, xviii)*

To date, the Okanagan have yet to receive compensation or accommodation for the impacts of any of the dams built by BC Hydro, without consultation with Okanagan.

It is into this already highly negatively altered Okanagan cultural environment that the Rev6 Project is currently proposed.

6.4 Characterization of Rev6 Project-Specific Effects on Culture

Please note: Initial draft materials on operation of the Project and impacts on Okanagan livelihoods and economy are discussed here; the technical information is primarily from BC Hydro and still to be subjected to technical examination between the parties. Impact pathways identified below may not be comprehensive and are provided without prejudice; others may be identified as new information emerges. Final BC Hydro EAC application materials are required in order to complete the impact pathways delineation and subsequent impact characterization assessments.

6.4.1 Project Impact Pathways on Okanagan Culture

BC Hydro's Section 7 of its draft Application (Heritage Effects Assessment) does not examine any of the above-noted existing adverse effects on Okanagan culture, for two key and problematic reasons:

1. The definition of "heritage resources" used by BC Hydro excludes all but physical heritage resources; and
2. No cumulative effects assessment is conducted; therefore effects to date are not generally included.

Thus, the impact pathways identified by BC Hydro in relation to "heritage resources" must be deemed both too narrow in temporal and issues scope to be an adequate assessment of effects of the Project on Okanagan culture. For instance, increased traffic, land clearing, and changing water conditions may negatively affect subsistence resources, which in turn impact Okanagan's laws of responsibility and stewardship, the ability to pass on traditional knowledge, and sense of place. It is in this expanded context, a more complete depiction of potential Project-specific effects on culture is provided herein.

The list of potential cultural effects pathways below was generated by first examining Table 7.2-9 in the draft Section 7 of the Application provided by BC Hydro to Okanagan Nation, which lists the potential for adverse effects and interactions emerging from specific Project activities on "heritage resources." Additional pathways were identified by Okanagan Nation based on the culmination and distillation of the ethnographic, interview, and historical data pertaining to Okanagan, and collected and detailed in this Part C report.

The locations of both main components of the Rev6 Project are critical to consider. Both are in important cultural areas that – despite existing alienation factors – still have cultural values for the Okanagan. Section 3.2.1 and Appendix 3 to this report illustrate the high cultural values in the Summerland Capacitor Station (SCS) location, especially for the Penticton Indian Band. Section

3.2.2 and Appendix 1 to this report illustrate cultural values in the Revelstoke Dam and MCR areas for multiple Okanagan Nations. Due to these high values and the physical changes likely to occur in these areas as a result of Rev6 construction and operations, adverse effects on all four Syilx culture indicators can be predicted for both locations.

In relation to **the "ability to meaningfully practice and pass on Syilx laws and traditional knowledge as they relate to traditional cultural practices"** indicator, we find the following in relation to the Project:

- In the CSC affected area, clearing, construction, and operation of the capacitor station could deter Syilx members from practicing traditional activities in this area. This would in turn affect the ability to pass on Syilx traditional knowledge as it relates to the area and the traditional activities engaged in there for the duration of the construction period and into the operation period as well. In addition, the area is well known and used for spiritual practices (especially vision quests and sweat lodges, horse dance ceremonies, and captikwl and smamay stories, among other values (Penticton Indian Band, Appendix 3, 9). Physical alterations of this place would adversely affect the ability to pass on Syilx traditional knowledge as it relates to the camp and the traditional activities engaged in there (see Appendix 3 for more details on effects of the CSC on Okanagan):

  > *The proposed substation, if constructed, will compromise how our youth are trained to hunt for deer or gather berries in the area. (Penticton Indian Band, Appendix 3, 12)*

- The construction of Rev6 will incrementally add to the numerous effects that the existing Revelstoke Dam has already had to the plants, animals and the natural systems of the Columbia River Basin, especially due to changes in water flows and erosion levels, and potential associated adverse effects on remaining fish and plant communities. Any additional alterations to this already seriously altered ecosystem will further erode the willingness and ability of Okanagan members to use the Mid-Columbia River area, reducing further the amount of area where Okanagan cultural practices and knowledge transmission are possible. During the construction phase of the project, it is predicted that Syilx members will be less inclined to visit, use and transit the areas where construction is occurring to practice their laws and traditions, due to increased traffic,[34] increased noise, smells, dust, human presence on the landscape, visual alterations, and a heightened sense of risk and being unwelcome. During operations, changes in the structure, water levels, and

[34] Notably, the expanded scope of culture and heritage herein suggests that, where BC Hydro's analyses found no potential adverse effects from the Project on heritage from traffic (e.g., the transport of machinery and maintenance), disposal of spoil, road widening, and the operation of machinery and presence of infrastructure (e.g., capacitor station, backup generator, and fuel tanks), that in fact a potential for harm exists from these activities via noise, smells and many other disturbance factors.

shoreline (and stigmas and risk perception associated with using an increasingly industrialized area), may reduce cultural practices in the area.

In relation to the **"ability to practice Syilx laws of stewardship and responsibility"** indicator, we find the following in relation to the Project:

1. The Project would "forever impact the syilx people's ability to utilize and take care of" the CSC location (Penticton Indian Band: Appendix 3, 12), by clearing it of natural vegetation and making it subject to management and alteration by BC Hydro.
2. The Project would extend the degree to which water systems and landforms are manipulated in the Mid Columbia River (primarily by BC Hydro physical works and activities), which will extend the existing lack of conformity with Syilx laws and norms to the contrary, and lack of engagement of Syilx in managing lands and resources according to these natural laws.

In relation to the **"ability to protect and respectfully manage burial and other archaeological sites"** indicator, we find the following in relation to the Project:

1. Increased risk to archaeological and/or burial sites at the Summerland Capacitor Station: As noted in Appendix 3 to this report, the SCS will be located in an area of high importance to the PIB, in particular. Despite the fact that no artifacts were found within the footprint for the SCS during an Archaeological Impact Assessment by the Proponent, PIB has substantial concerns about loss of historic and cultural value at the site:

   > ***This does not mean that archaeology is not present within the footprint area or that the area was not used for resting or travelling or the variety of other purposes…*** *Archaeology, although an important tool, is generally subjective and samples an extremely small percentage of the overall land used. (12)*

2. Increased risk to archaeological and/or burial sites in the MCR: SNC-Lavalin (2016, 16) conducted a detailed assessment of site erosion risk for 39 documented archaeological sites in the MCR area. It is estimated that in the Project case "15 sites are predicted to experience an increase in site erosion risk due to the Project case" from scour and lateral erosion. No assessment of the overall cultural importance of any of these sites or any other sites which may be subject to higher erosion risk has been conducted; Okanagan Nation has not been involved by BC Hydro on the ground in establishing the importance of the affected reach of the MCR. The effects of changing water and hydrological regimes on Syilx historical sites and ancestral remains are unacceptable. These are spiritual sites of great significance to our people and must be treated with the utmost respect. Fluctuating water levels continue to cause remains and artifacts to be unearthed and looted. As Syilx people, we have a responsibility to protect our ancestors and historical resources. Our ability to uphold this

responsibility is being further challenged by the addition of the sixth turbine. Any additional loss of archaeological, burial or cultural sites in the MCR will exacerbate existing losses due to changes from a natural river to a dam release point, with a variety of attendant cultural use and value losses. Okanagan has seen too much of our traditional use and cultural and spiritual sites alienated – sometimes literally washed away – already.

In relation to the **"ability to navigate a changing landscape and changing place names"** indicator, we find the following in relation to the Project:

1. The CSC represents a physical clearing and infrastructure-building project in an area well known and used by PIB, with multiple associated place names. Okanagan members' ability to understand and navigate their cultural landscape will be altered by its presence and associated industrial activities, which will alter the landscape and may reduce the utility and meaning of specific place names and associated stories – "Large structures like substations change the dynamic of a place, the energy is altered and being out on the land is not the same – so the transfer of knowledge is impacted" (Penticton Indian Band, Appendix 3, 12). It can be predicted that the lessons the area has for Okanagan will be lost or reduced in meaning by these alterations.
2. The increased erosion risk in the MCR area, predicted by BC Hydro, may lead to speeding up of changes both in the river bottom (affecting navigability) and shoreline, further reducing already constrained accessibility and willingness of Okanagan harvesters to use the highly altered area.

6.4.2 BC Hydro Committed-to Mitigation Measures re: Culture

BC Hydro does identify some mitigation applicable to the protection of physical heritage resources. Detailed in Section 7.2.4 and Table 7.2-10 of the Draft Application are the mitigation measures committed to by BC Hydro (SNC-Lavalin 2016n). A total of six are described including:

- M1.1 Avoidance through Project design or relocation;
- M1.2 Non-intrusive systematic data recovery techniques;
- M1.3 Systematic data recovery techniques and the development of a systematic data recovery program in consultation with First Nations and BC Archaeology Branch;
- M1.4 Development of Chance Find Management Procedures;
- M.1.5 Monitoring in the event of chance finds and unexpected exposure/disturbance of heritage sites with high significance; and
- M1.6 Development and implementation of erosion protection for heritage sites determined to have high significance, to be submitted to BC Archaeology Branch.

The above-proposed mitigations have several major limitations. First, they are incomplete and crucial details are lacking, for instance M1.3, M1.4, and M1.6 all suggest that a plan to develop a plan is mitigation. This is insufficient information upon which to determine the potential for residual effects; a discussion of likely success of such plans in preventing damage to physical heritage resources is also missing.

Secondly, due to the limited definition of heritage used in Section 7, the proposed mitigations do not address the potential Project-specific effects that may impact other dimensions of Okanagan culture.

Third, the enactment of certain mitigations is contingent on the "significance" of the resource. Significance of the resource is to be based on the BC Archaeological Impact Assessment (AIA) Guidelines, however BC Hydro does not detail how the checklist and guidelines will be employed, such as the weighting of criteria, and does not include:

- Okanagan input – affected culture group specific – on site significance; or
- Rigorous documentation of the process used to derive a measure of relative site significance, particularly the system for ranking or weighting various evaluatory criteria (as required per Section 3.5.2.2 of the AIA Guidelines).

The Okanagan have furthermore suggested a number of mitigations and revisions to the mitigations presented in Section 7.2.4 of the Draft Application (SNC-Lavalin 2016n), including[35]:

- Designation of protected areas and signage for sensitive areas;
- Greater outreach and education, including media releases but also enforcement;
- Prioritizing mitigations for sites with greater public access;
- Systematic data recovery may not be a desirable mitigation as it destroys a site and preference is for no disturbance;
- Inclusion of avoidance during Project operations; and
- Inclusion of compensation.

None of the above-noted required additional mitigation recommendations have been adopted by BC Hydro at the time of drafting of this report. *It is also important to note that the mitigations listed above were in response to early BC Hydro estimations of physical heritage impacts, and not to broader cultural impacts that have been identified in this Part C Report. Further consultation is required on the required mitigation, monitoring and compensatory measures required beyond physical heritage.* The inclusion of greater and more encompassing indicators on culture is more

[35] These mitigations were presented and discussed at the Archaeology Technical Task Group Meeting on November 8th 2016. Summary notes from this meeting can be found here: https://rev6corecommittee.wordpress.com/technical-task-groups/

reflective of the actual requirements for the safeguarding of Okanagan culture and of the potential effects of the Project as compared to the approach taken and conclusions drawn by BC Hydro's assessment.

The illumination of additional valid impact pathways in this Part C report suggests revisions are required of BC Hydro's proposed mitigations. Mitigations should be developed in close communication with Okanagan. The determination of what sites and areas that require mitigation and further protection should also be chosen with a widened lens of cultural sensitivity.

Regarding the broader issue of mitigation for cultural continuity, despite strong and consistent efforts to protect and promote Okanagan cultural continuity, it is at a precipice due to factor beyond Okanagan control. As Vanclay (2002, 199) notes:

> *Cultures have well developed systems that allow them to cope with a **degree** of change, provide survival mechanisms, and provide for the effective functioning of those societies. When change is too rapid, or when there are exogenous shocks with which the system cannot cope, there may be disregard for traditional cultural practices by members of society… (emphasis added).*

While Okanagan have made and will continue to make every effort to protect both the cultural values themselves and those things that promote cultural continuity and reverse the tide of adverse effects on our culture, our efforts come with a cost in terms of time, effort, funding, mental health of our people and staff, and ability to focus on other important social and economic priorities. Protection of cultural continuity is not a costless transaction, in other words. It is time for the Crown and BC Hydro to recognize their responsibilities, including due to legacy effects on our culture, and redouble efforts to support Okanagan cultural continuity.

From the Okanagan perspective, a Project can be said to be contributing to adverse impacts on Okanagan culture if it adds measureable or otherwise observable adverse impacts to any of the following priority culture indicators:

- Ability to practice and pass on Syilx laws and traditional knowledge as they related to traditional cultural practices;
- Ability to maintain traditional laws of stewardship and responsibility;
- Ability to protect and respectfully manage archaeological sites and resources; and
- Ability to navigate a changing landscape and changing place names.

In addition, any adverse effects on the ability for Okanagan to preserve and enhance our sense of place, our connection to territory; and any adverse effects on cultural continuity factors such as language, and time spent on the land, must be taken into consideration.

Our examination of the potential effects of Rev6 using an expanded consideration of Okanagan culture and heritage, suggests greater and more widespread potential for adverse effects across the construction and operation phases of both generation and capacitor components of the Project, than those preliminarily identified by BC Hydro.

As these impact pathways have not been examined by BC Hydro, Okanagan Nation has no Proponent effects estimations to compare to. Further consultation between the two parties is necessary regarding required mitigation, so that residual effects after mitigation can be estimated. What can be said confidently at present is that, should Rev6 proceed:

- Okanagan physical heritage and cultural use and value sites will be at greater risk in the MCR and SCS areas than in the pre-Project case;
- The physical landscape (and thereby its cultural meaning and Okanagan knowledge of it) will be altered in both locations – in the MCR due to erosion increases and altered water flows, and the SCS due to a new physical infrastructure project on the ground;
- Increased construction activities and associated noise, smells, dust, traffic increases, settler workers, and vibration will further alienate cultural uses in both areas;
- Okanagan ability to govern according to natural laws will further decline and the repercussions in terms of habitat and harvesting and cultural utility will extend to new, previously less disturbed areas; and
- Okanagan sense of place – sense of their relationship to the MCR and the area where the SCS is planned – will be reduced and devalued. Knowledge of the cultural landscape of the Okanagan will become that much murkier.

For both locations, the Project puts them at risk of deeper alienation of Okanagan members than already exists.

Because effects on culture indicators inevitably spin off to influence other aspects of the lived experience, there is every reason to believe that these impacts will add incrementally to other social and cultural changes already plaguing the Okanagan, including but not limited to:

- Reduced inter-generational engagement (youth and elders);
- Reduced practice of – and even knowledge of the values and responsibilities of – sharing and ceremony;
- Reduced physical and (especially) mental health, especially due to a sense of helplessness and loss;[36]

[36] Such "psychosocial" effects outcomes are very real and merit much closer attention in relation to BC Hydro activities in the Columbia River Basin specifically, and more generally in relation to the entire Okanagan Territory. See Health Canada. (2005). *Addressing Psychosocial Factors Through Capacity Building: A Guide for Managers of Contaminated Sites.* Ottawa: Minister of Health, June 2005.

- Loss of critical connection to the Okanagan cultural landscape;
- Reduced knowledge of the Nsyilxən language;
- Reduced knowledge of *captikʷɬ*; and
- Continued heightened dysfunction (e.g., negative coping strategies) due to cultural and governance loss.

BC Hydro's committed-to mitigations will be inadequate to avoid or substantially reduced Project-specific impacts on Okanagan culture, especially beyond the protection of physical heritage resources.

Rev6 as currently proposed thus has high potential to add adverse effects to all Okanagan culture indicators.

NOTE: BC Hydro makes no overall estimate in its draft Application (Section 7) of the likelihood, magnitude or significance of adverse effects on physical heritage, and no estimate of other cultural impacts is provided. Okanagan Nation will reserve judgment on assessment of Project-specific or total cumulative effects in the Project Case until information and mitigation gaps are filled – such assessment and any discussion of it is premature at this time.

Please note: Okanagan Nation and BC Hydro have not yet met to discuss required mitigation to reduce potential adverse effects from the Project, alone and in combination with cumulative effects causing agents (including prior BC Hydro actions). At any such meeting BC Hydro is invited to identify additional mitigation it believes will successfully avoid, reduce or compensate for impacts on Okanagan cultural values.

7 Livelihoods and Economy

7.1 Introduction: Okanagan Livelihoods and Economy Related Values and Indicators

Today, Okanagan member livelihoods include a combination of engagement in activities related to the traditional economy (harvest, trade, etc.) and the western economy (wage-employment). This section examines Okanagan traditional livelihoods and economies and change over time, toward today's hybrid economy, the cumulative implications of these changes for Okanagan rights and interests, and identifies effect pathways of the proposed Rev6 Project on the Okanagan livelihoods and economy VC.

Given that the importance of fish harvesting to Okanagan is covered in Section 5, this section focuses on terrestrial livelihoods. The Rev6 Project may have terrestrial Okanagan livelihood impacts in both the area around the Revelstoke Dam and Generating Station, and the proposed Summerland Capacitor Station. Both locations are subject to assessment herein.

A full consideration of Project-specific effects and total cumulative effects in the Project Case cannot be completed until: a. BC Hydro fills information gaps in the assessment materials it has provided Okanagan to date; and b. the parties meet regarding mitigation requirements.

7.1.1 Key Indicators of Okanagan Livelihoods and Economy Values

Table 7.1 identifies key indicators linked to Okanagan livelihoods and economy, as identified by Okanagan Nation representatives.

Table 7.1: Key Indicators for the Okanagan Culture VC

Valued Component	Key Indicator/Measurable Parameter
Livelihoods & Economy	• Local employment opportunities consistent with Okanagan values • Access to education and training opportunities • Self-sufficiency • Ability to meaningfully practice Indigenous economy and livelihoods • Ability to harvest adequate quality and quantity of traditional foods and medicines • Ability to meaningfully practice Aboriginal rights for traditional food and medicine harvesting • Food Security (in relation to game and plants; fish are examined in Section 5)

7.1.2 Okanagan Rights Related to Livelihoods and Economy

It is understood that Syilx hold multiple rights, unceded at any time to the Crown, in relation to terrestrial livelihoods and economy:

- Right to hunt on territory;
- Right to trap on territory;
- Right to access and freedom within our territory;
- Right to harvest food and medicinal plants on territory;
- Right to harvest raw materials from the land (e.g., trees, bark, stone);
- Right to manage forest through prescribed burning and stand management;
- Right to mark and otherwise identify traditional use sites;
- Right to develop traditional use sites, for example constructing a camp, lodge, trail, or boat launch;
- Right to carry equipment and materials necessary for hunting, trapping, and harvesting, including such things as arms and ammunition, spears, steel bladed instruments, etc.;
- Right to decide how the lands, waters and resources can be used;
- Right to manage the lands, waters and resources; and

- Right to take economic benefits from the lands, water and resources.

7.1.3 Livelihoods and Economy-related Laws, Norms and Guiding Principles

Okanagan's laws, norms and guiding principles associated with the Livelihoods and Economy VC include (but are not limited to) prescriptions and principles for interacting and relating with the land, especially with respect to future generations, including: [37]

- Sustaining the diversity of terrestrial species and their habitats in perpetuity for the well-being of future generations;
- The land is at the centre of how we are to behave; without land we are endangered as a life form and we in turn endanger other life forms;
- Activities in the community will be conducted with respect for the land *[tmxʷulaxʷ]*, traditions and way of life [naʔkʷl'məntət], prayer *[nk'ʕaməntət];* strength and help), and belief system and spirituality [iʔnunxʷinaʔntət];
- The right of being Syilx comes with a responsibility to follow the natural laws and make sure the land is healthy for generations to come;
- Preserve the land in its natural healthy state for each generation through knowledge and the practice of natural law; and
- *kəɬʕaċxən*: "always look underneath our actions to see how our actions or the tracks that we leave are connected to the future, to our grandchildren, to the continuation of all creation, and to the tracks that they make on the land into the future" (Armstrong 2007).

Okanagan people and governments make every effort to live up to all the natural laws and principles passed down from prior generations. These natural laws and the rights of Okanagan also drive terrestrial livelihood goals and aspirations of the Okanagan, which include but are not limited:

- Promotion of Okanagan country food security and food sovereignty;
- Re-establishment of pre-contact habitat and endemic wildlife and plant species distribution and abundance in Okanagan territory;
- Re-establishment of traditional food exchange/trade networks; and
- Re-establishment of meaningful practice of Okanagan inherent responsibility to nurture and care for indigenous food systems.

[37] Sources for deriving these laws and norms were identified in Section 2.4.3.

7.2 Attributes of Pre-Contact Okanagan Livelihoods and Economy

Okanagan livelihoods prior to contact were exclusively subsistence and materials trading with other First Nations; there was no “wage economy” in the current meaning.

This does not mean that this economy was not robust, wide ranging, and well defined. As described in Section 2.4.1.2, oral and archaeological records confirm that there was an abundance of terrestrial resources in the Pre-contact Columbia plateau that were integral to supporting a complex diet and way of life for people in this region. Livelihoods and economies were based on the availability of a diverse network of resources, and resource acquisition followed an annual seasonal round as they became available. Syilx people needed to travel over vast networks of valleys, mountains and through ecosystems that were sustained by a river system composed of four main rivers: the Columbia, Okanagan, Similkameen, and Kettle River. These waterways were important for transportation by canoe, and Okanagan people also travelled by foot in order to access a wide variety of resources that were either seasonally abundant or accessible at different elevations (Carstens 1991). Seasonal village sites were often located near prime resource harvesting areas for the purpose of processing and preserving, and in the winter Syilx people would re-centralize in larger villages where roots, plants, and animal resources would be stored.

> *To sustain themselves throughout the year, and from year to year, it was necessary to travel widely through the networks of valleys as well as up and down the mountainsides and across mountain ranges in order to exploit the very broad range of food plants and the animals that ripened or became seasonally more abundant or more accessible at various times of the year. Further travels to diverse destinations were necessary to obtain technological materials, to practice their religion, to trade, and to socialize with relatives. (Carstens 1991, 2)*

Seasonal rounds included fishing (Section 5), hunting, and gathering of plants, roots, and other foods. These resources were harvested as part of a complex seasonal round with rules governing access and use that were largely determined by ties based on kinship, trade, and political relationships. This round “followed a cycle beginning in the spring and signalled by the reappearance of migrating birds and hibernating mammals” (Miller 1985, in Carstens 1991). Family groups were highly mobile and relied on an extremely large land base within which to harvest different resources. The seasons varied in resource availability and access, as well as resource processing, preserving and storing for the winter. As referenced in Section 2.3.1.2, the Syilx had four primary hunts each year: “in spring for deer and sheep; in late fall for deep, sheep, elk, and bear; in midwinter for deer; and in late winter for sheep” (Kennedy and Bouchard 1998, p. 241). A variety of technologies were developed for successful hunting and fishing; including bows and arrows, knives, tomahawk and war clubs, nets, weirs, traps, single and double pointed spears.

Plant harvesting was critical to medicines, food and trade.[38] Technologies were developed for harvesting roots, berries and plants, and included digging sticks, woven baskets and bark trays (Carstens 1991).

Ethnographic evidence and traditional knowledge and stories situate Okanagan within the areas covered by the:

- Summerland Capacitor Station (see Section 3.2.1 and Appendix 3); and
- Revelstoke Dam up to Mica Dam (which was all then part of the natural Upper Columbia River), and downstream into Arrow Lakes (see Section 3.2.2 and Appendix 1).

Complex management systems were key for resource governance and land use, in order to encourage a continuum of resource availability. Management units could include having areas that were for collective harvesting and use, while other areas would be managed by specific families, or by the headman. Thomson (1994, 98) describes two economic strategies employed by the Okanagan to make them less vulnerable to starvation in years when fish or other staple resources were scarce:

> *The multi-faceted economy of the Okanagan people was marked by insecurity of production, which necessitated a relative shifting among resources when one product was scarce. The Okanagan people were less vulnerable to periodic bouts of starvation than the predominantly fishing tribes, such as the Thompson and Shuswap Indians, because they did not rely on a single staple resource. Nevertheless, life was precarious. The lack of any significant annual surplus required the Okanagan to develop a high degree of flexibility in their economic activity. …For major storable products, such as the salmon and deer obtained in the autumn, production and distribution were communal and operated through the office of a headman. For other products, such as roots, berries, and basket-making material, production was organized by individual families who retained ownership of the goods. Thus, the Okanagan Indian resource management regime recognized either band or individual ownership of resources. For additional flexibility and security, the Okanagan allowed regulated access to their resources by, and maintained extensive trade connections with, neighbouring tribes.*

Carstens (1991, 9) describes land management practices further, and the division between commonly and privately managed lands:

> *Vast tracts of land were regarded as commonage but some parts seemed to have become the preserve of local people. At times certain bands, and sometimes villages, claimed much more than usufructory rights over fishing*

[38] See Section 2.4.1.2 for a list of plant harvested by Okanagan.

> *grounds, particularly weirs where fish were trapped. Ownership of private property was, however, widespread, ranging from slaves to numerous items of moveable property, such as snares, deer fences, deer nets, weapons, tools, baskets, and dogs. Even Okanagan songs were considered the property of their owners.*

Families also had important economic roles. Some families passed on specialized skills and knowledge bases about different aspects of Okanagan economies; including, but not limited to, hunting, tanning, fishing, berry picking, basket making, and leatherwork. Labour in families was further divided up by age and gender, and each person played a very important and specialized role in Okanagan peoples' complex domestic economy (Carstens 1991).

Resource surpluses varied from year to year, and diversity in resources was vital both for safeguarding harvests for the winter as well as for having surpluses that could be traded with neighbouring nations. Though not guaranteed each year, when surpluses were available they were useful for trade, for production of tools and crafts, and for times of war (Carstens 1991).

The Okanagan were also recognized among neighbouring nations for their craftsmanship (Carstens 1991). These craftsmanship skills were useful in maximizing available raw materials and creating innovative tools for harvesting, as well as for participating in larger trade networks. Trade items included "dried salmon, deer-nets, skin bags, dressed moose-skin, scent, paint or red-ochre, horses, bark made into twine for snares, bone or horn beads, arrow points, roots, wild hemp and berries" (Scheuerman 1982,18-19; Hudson 1996, 25; Mellows 1990, 91; in Sam 2008). Carstens (1991) describes further some of the tools and crafts that Okanagan people would trade:

> *The Okanagan made tools of stone, bone, and wood, household utensils, and a variety of paints and dyes. Their leather work was excellent, as were their mats, woven bags, blankets, and especially their coiled baskets…*

Trade was an important part of Syilx economies, and the Revelstoke area was particularly important for trading:

> *[Interviewer: Do you know any trails from over in the Revelstoke area?] Yes. From the United States, that they'd come up… Alberta that came, I have them map… Trading… there was …. Hides, cause our people never had those kind of hides to keep us warm. They used deer hides out of coats to keep up warm, but our deer wasn't as [warm]… So, and the foods that we have here, Alberta don't have it cause its just like this here… So our people used to go over there to trade buffalo hides, even bones… Buffalo bones. They used to make it for trinkets. (ON06 2016)*

In summary, prior to contact, Okanagan people had a complex subsistence and trade economy and diversified livelihoods that were tied to the seasons. Cultural values of "giving, sharing and

avoiding over-consumption" were central to maintaining food security and a central tenet of governance overall (Okanagan First Peoples 2008e). Established management systems were both assertions of sovereignty through governance and presence on their lands, as well as means of maintaining the diverse resources and ecosystems that existed there. Syilx people had access to and complex knowledge of abundant game, fish and plant species required to secure vibrant livelihoods and economies in the time before contact (Kennedy and Bouchard 1998). Indeed, the first European explorers who traveled down the Columbia River would have "seen large herds of deer, elk, mountain sheep, and mountain goats, not to mention the large flocks of migrating waterfowl" (Sam 2008, 1).

7.3 Change Over Time on Okanagan Livelihoods and Economy

Please note that this section examines only terrestrial harvesting; cumulative effects on Okanagan fishing practices are examined in Section 5.3.

The ability of the Okanagan to meaningfully engage in Indigenous livelihoods and economy, harvest adequate quality and quantity of traditional foods and medicines, meaningfully practice Aboriginal rights for traditional food and medicine harvesting, to be food secure and maintain self-sufficiency, have all been eroded since contact. Exacerbating the situation, access to education, training opportunities and local employment opportunities consistent with Okanagan values, have been challenging for Syilx people, who have faced persistent poverty and systemic barriers to full integration into the wage economy.

7.3.1 Hydro Era Effects on Okanagan Livelihoods and Economy (1930s to Present)

The introduction of the horse and gun, the fur trade, the establishment of the Canada-US border in 1846, gold rushes and settler influxes, and the re-settlement of Okanagan people onto reserves and fixed settlements were important factors in spurring a transition from traditional livelihoods and economies after contact. [39]

As a result, Okanagan livelihoods by the 1930s had started to shift from exclusively traditional on territory activities to a mixture of wage and traditional economic activities. This shifted even more between the 1930s and present and, while to present day Okanagan diets still incorporate a variety of traditional 'country' foods and members seek to engage in their traditional mode of life, it has become harder and harder, given progressive constraints on our land base and harvesting rights.

[39] Effects of multiple settler and Crown change agents on Okanagan livelihoods are spelled out in further detail in Section 2.5.1.

In the Hydro Era, increased industrial and recreational settler activities, land privatization, large influxes of settlers into the Okanagan and Columbia River valleys, all served to impede Okanagan access to land, availability of wildlife for harvesting, and quiet enjoyment of land, all critical factors in meaningful aboriginal rights practices. Damming activities since 1968 in the Canadian portion of the Columbia River was one of the most devastating effects causes.

The adverse effects of damming the Upper Columbia played a variety of key roles in reduced practicability of Okanagan terrestrial livelihoods. As noted in Section 4, more than 120,000 hectares in the Canadian portion of the Columbia River Basin have been inundated as a result of BC Hydro dams along since 1968. Large portions of the inundated zone had previously been productive forests,[40] lowland to upland areas with high wildlife values. Okanagan is not in possession of information about how much terrestrial wildlife habitat was lost due to the flooding of Arrow Lakes and inundation of what is now Revelstoke Reservoir,[41] but we have proxy data from the Mica Dam, which suggests the following:

> "The inundation of land for the Mica Dam was estimated to have resulted in a loss of 42,500 ha of wildlife habitat, including wetlands, riparian zones, and natural meadows. It was predicted that this habitat loss would cause reductions in populations of moose, (70 per cent), deer (50 per cent), elk (40 per cent), and caribou (10 per cent) as well as the displacement of most aquatic animals and waterfowl" (BC ELUC 1974, cited at p.14 of Toller and Nemetz 1997).

The population health, abundance and distribution of wildlife was fundamentally altered by inundating what were once relatively narrow rivers, passable by many creatures, into much wider reservoirs. Critical live stage areas were lost; as much as one-third of critical low elevation winter range for ungulates was also estimated as a result of Mica Dam (BC ELUC 1974).[42]

The lowlands in the Columbia River valley in places like Revelstoke and the Upper Arrow Lakes, now largely inundated or otherwise alienated, were well known for harvesting ungulates and furbearers, and for roots and berries. Thus, both preferred locations and species were progressively alienated from Syilx, and the total biomass available for harvesting, even for secondary (non preferred) species, likely declined precipitously, as a result of flooding in the Upper Columbia.

If these were the only factors infringing on Okanagan harvesting rights, they would be bad enough. However, as discussed in Section 5, the traditional livelihoods of Okanagan actually faced dual, vice like pressures during the Hydro Era as a result of dams, changes to water, and flooding. On

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[40] Even by 1970, long before the Revelstoke Dam was built, approximately 50,000 hectares of "some of the most productive forests in Canada" were inundated (Toller and Nemetz 1997, 11).

[41] *This is a serious information deficit flagged for BC Hydro's attention and response.*

[42] While Okanagan rejects, as it does with water (see Section 4), the commodification of wildlife, we note that the BC ELUC in 1974 calculated half the "total capital value" of all wildlife resources, except waterfowl, was lost from the Kinbasket Reservoir area due to the Mica Dam. This is evidence of serious ecological loss

the one side in the waters, their strong reliance on salmon was subject to almost total failure by the early 1940s due to hydro dams in the US. With the salmon gone, Okanagan had to shift to other fish and game. However, with reduced spawning grounds and population numbers for multiple additional fish species in the CRB after 1968, and both physical declines and increased competition for game resources with settler "recreational" harvesters, those game species were themselves under pressure and in decline. Together, these terrestrial and aquatic changes had devastating effects on Okanagan traditional livelihoods.

7.3.2 Cumulative Effects to Date on Okanagan Livelihoods and Economy

Impacts on Okanagan lands have resulted in a large number of changes in Okanagan livelihoods and economy. These impacts are evidenced in rapid transitions in local economies, degradation of Syilx resources and their ability to access these resources, and food insecurity and income disparity in OKIB community when compared to the surrounding community.

Please note that Okanagan Nation does not have access to adequate information to conduct a full characterization of change over time from pre-dam conditions on the terrestrial environment in the Project-affected area to assist in these characterizations. This is one of the reasons we are calling for a full cumulative effects assessment for the Columbia River Basin, including reconstruction of a pre-industrial ecological conditions set, and associated detailed traditional use and traditional knowledge study with the Okanagan focused on the effects of cumulative change of dams in the Hydro Era on Okanagan water values, indicators and rights.

Direct effects that have reduced the practicability of the Okanagan way of life on the land have spun off in many additional adverse directions across all walks of life. As noted at the 1st Annual Interior of B.C. Indigenous Food Sovereignty Conference in 2006 (Morrison 2006, 7):

> *Displacement from the land and the centralization of food production in the mainstream culture has resulted in a sedentary lifestyle… parents have less time to participate in hunting, fishing and gathering activities and spend less time teaching their children Indigenous food related knowledge.*

Many other spinoff effects of this enforced reduction in traditional livelihoods have been observed and experienced. They include but are not limited to:

- Increased exposure to food related illnesses (e.g., Type 2 diabetes, heart disease, among many others) as country foods have been replaced by less nutritious and expensive store-bought foods (Morrison 2006);
- Decreased food security for many families;
- Reduction in food sharing (though the guiding principle remains);
- Reduced real and perceived self-sufficiency;

- Reduced real and perceived mental and physical health;
- Radically reduced inter-tribal trading frameworks;
- Loss of place-based knowledge, connection to the Okanagan cultural landscape, and reduction in Nsyilxən language retention;
- Reduced interactions between youth and elders, and inter-generational knowledge transfer; and
- Reduced ability to adhere to Syilx natural laws.

Overall, since contact there has been an extremely large adverse effect on traditional Okanagan livelihoods from a wide variety of sources. Alongside this fundamental erosion of our way of life and economy, has been a set of system barriers to full integration of Okanagan people into the wage economy that settler culture has replaced it with. As a result, our people are caught between two worlds, unable to fully sustain ourselves with our traditional livelihoods, while at the same time substantially marginalized economically when compared to our new neighbours.

7.3.3.1 Current Okanagan Livelihoods and Economy Conditions

NB: Information on degree of engagement in traditional livelihoods and participation in wage economy for WFN and PIB is not available at the time of drafting, nor has there been a detailed study on the distribution, reliance on, and constraints to, aboriginal harvesting practices for any of the affected Okanagan First Nations (including OKIB). Data to inform this section will be collected in the socio-economic baseline studies planned to take place in the Spring/Summer of 2017.

Prior to the 1970s, Okanagan families reported being more actively engaged in harvesting throughout their territory. Although harvesting remains an active part of life for some Syilx members, the number of harvesters and the amount of time spent on territory harvesting has declined to present day. A recent socio-economic study determined based on engagement with a large number of OKIB members that the greatest decline in activity was in the area where the Revelstoke and Mica Dams are located (Firelight and OKIB 2016, 67). This was estimated by having elder respondents identify areas within the territory they remember harvesting game, fish, birds, berries and roots both prior to 1970 and in present day. Prior to 1970, 87% of respondents recall harvesting game in the Upper Arrow Lakes area. One OKIB member articulated some of the changes in his own ability to practice his harvesting rights within his lifetime:

> There’s one more level of our existence that’s k’wasic. That k’wasic is a time when you are not allowed to take one fish you’re not allowed to take one berry and when they first told me that I was a kid. We used to go to deep creek and mission creek to get tub loads of kiknee. Now when the kiknee is running ... if we went over there an touched one fish we would go to jail ... today, right. Today you would go to jail if you went an got a tub load out of deep creek or

mission creek. Now before I go into all of that. I am very worried about what is happening today here. (ON01 2016)

Overall, only 54 per cent of OKIB respondents indicated they had hunted, 51 per cent had fished, 71 per cent collected berries, 31 per cent had dug for roots, and 63 per cent had harvested medicines in the past year.

Okanagan diets from the 1930s to present day still incorporate a variety of traditional 'country' foods, but the spectre of food security and declining available harvestable foods is front –of- mind for many of our members. The Food and Agriculture Organization defines that food security exists "when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life."[43] In Canada and the U.S., the term 'food insecurity' is commonly used to describe households and individuals who identify as not having enough income to cover food costs. Participants in the recent OKIB socioeconomic baseline study were asked questions related to food security (The Firelight Group and OKIB 2016

In terms of traditional food security, a majority of OKIB households (58% – see Figure 7.1 below) indicated they sometimes to often worried about the security of their traditional food supplies (i.e., that they would run out or that they couldn't get more of what they needed). The exact same percentage (58% – Figure 7.2) indicated that in the past year, their traditional food supplies sometimes or often ran out and could not easily be replenished within 12 months. These are strong indicators of current country food insecurity among our members.

[43] Food and Agriculture Organization (1996). Rome Declaration on World Food Security and World Food Summit Plan of Action, Rome, Italy. Available at www.fao.org/docrep/003/w3613e/w3613e00.htm

Figure 7.1: OKIB Members Who Worried That Traditional Food Supply Would Run Out

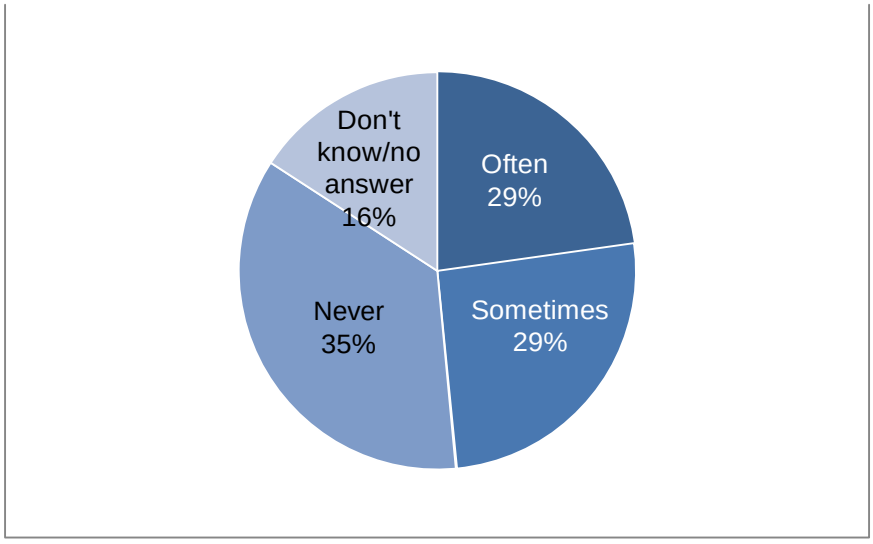
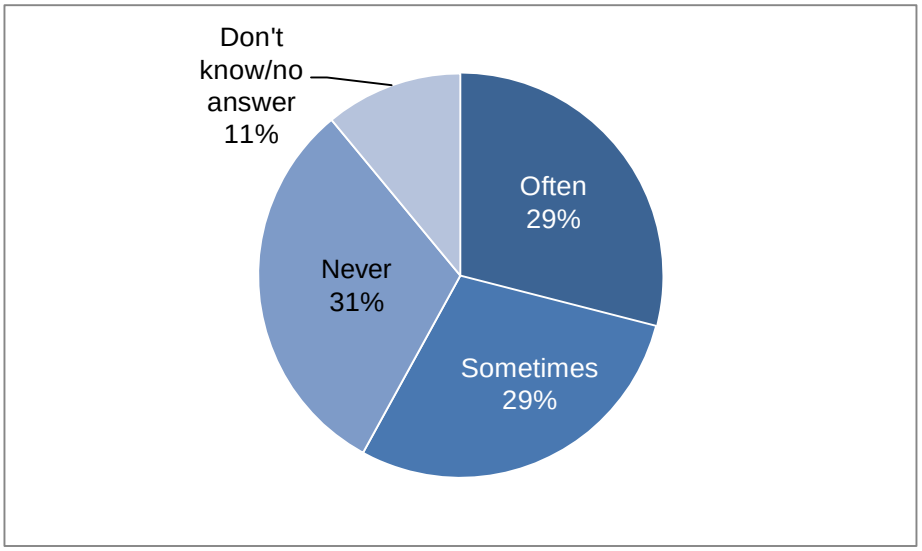


Figure 7.2: Traditional Food Supplies Didn't Last and We Couldn't Get More



These numbers and what our members tell us about reduced harvesting success and time spent on the land are especially troubling in light of the fact that traditional food security is an indicator of more than just health and nutrition – it gives our members so much more for their social and cultural well-being. Traditional food harvesting (and consumption) is a practice that our members widely report (and research adds confirmation to across many indigenous groups):

1. Brings together multiple generations and promotes respectful and appropriate relationship building;

2. Promotes activity on the land, which is good for mental and spiritual health, as the land is recognized as a source of solace for Okanagan members;
3. Allows for the passing on of traditional teachings about the skills and knowledge needed to survive on the land;
4. Promotes use of Nsyilxən language;
5. Promotes physical health through higher activity levels;
6. Contributes to a diet that is typically healthier than store-bought foods;
7. Creates a sense of pride and self-sufficiency among harvesters; and
8. Promotes values retention and community relations through sharing of foods in the community after a successful hunt.

When traditional food security is compromised, these positive associated effects of harvesting and consumption of traditional foods are also compromised. As Syilx people are increasingly alienated from the land (whether through privatization, industrial developments or lack of time due to wage employment), traditional food harvesting and consumption decreases. People are then increasingly reliant on the purchase and consumption of high-cost, store-bought foods that are often of lower nutritional value than traditional foods. This can lead to increased nutrition-related health issues (diabetes, obesity, high blood pressure, etc.) (Dialogos Educational Consultants 2006).

In relation to the wage economy, OKIB members[44] exhibit and report the following:

- Employment disadvantages in comparison with surrounding non-Aboriginal populations across recruitment (getting a job), retention (keeping a job), and advancement within a workplace or career path;
- Lower income and higher vulnerability to inflationary pressures for First Nations people, especially on-reserve populations;
- High unemployment and vulnerability to boom and bust effects for First Nations workers;
- Lack of apprenticeships and job opportunities to gain work experience near the reserve (many opportunities would require relocation, including construction opportunities with Rev6);
- Lack of capital, business skills and systemic barriers that constrain successful business starts both at the Band level (OKIB) and among individual members (The Firelight Group and OKIB 2016); and

[44] Again, it is important to clarify that this information is from study of OKIB members only and that further study is necessary to identify the economic status and ability to take advantage of employment, business and training opportunities, of other Okanagan Nations.

- Increasing tension between wage economy participation and a continuing desire to uphold and maintain the traditional economy and way of life on the land;

OKIB members seeking wage employment also face multiple barriers, most commonly: physical health, seasonal business, lack of qualifications, personal and/or family responsibilities (e.g. caring for children or elderly); and no driver's license (The Firelight Group and OKIB 2016).

Overall, the evidence suggests that Okanagan members are more likely to face persistent poverty and weaker engagement in the wage economy than their non-indigenous neighbours, and that systemic barriers to overcoming these deficits remain. For many Okanagan, traditional livelihoods represent an insurance against socio-economic and cultural marginalization. They bring people peace of mind, food for the table, and other benefits:

> *Lots of people are low income people. Just because the monetary part isn't there, doesn't mean they are poor. They may have a lot of wealth because of what they can do on the land or on the water. (Firelight & OKIB 2016)*

Additional decline in engagement in traditional livelihoods would clearly have multiple associated losses for Okanagan peoples.

7.3.3.2 Discussion of Cumulative Effects to Date on Syilx Livelihoods and Economy

Negative changes have occurred on all Syilx livelihoods and economy- related indicators as a result of changes since contact.

Local employment opportunities consistent with Okanagan values: Okanagan have increased their engagement in the wage economy over time, but are still far behind setter populations in employment rates and income. No study has been conducted as yet on their level of job satisfaction and actual vs. preferred economic activities (many of our members would prefer to engage in non-destructive, on-territory, careers. On-reserve employment is limited, and many of our members are still seasonally employed if at all, due to remaining systemic barriers to increasing their employability.

Access to education and training opportunities: OKIB members who participated in the 2016 socioeconomic study indicated that there often education and training opportunities available in the trades, but that a) there was a lack in availability of follow-up apprenticeships and entry- level positions in order to build on the skills developed in training programs and b) these are not the types of opportunities that all members are looking for. Further, the respondents discussed how one year there might be training associated with jobs related to a specific project, but once that project was complete their skills in that trade became effectively unusable with nowhere to apply them. Many training certificates and tickets expire. The highest ranked fields of interest for training and education opportunities by OKIB members are: social sciences, business, finance,

management and health. The largest barriers identified to accessing training opportunities include: lack of financial support, current employment (needing to maintain an income to support ones' family), and other family responsibilities.

Self-sufficiency: At contact, our members, families and groups were tight knit, fully self-sufficient, economic production units. Survival relied upon self-sufficiency and ability to harvest food, fuel, shelter and clothing from the land, and our people excelled at it. Due to factors imposed upon us since contact, these skills – while still strong in many members – have measurably declined and will continue to do so if traditional livelihoods are not practiced and practicable on a regular basis. In terms of economic self-sufficiency many of our members and families report no longer having some of the basics, especially adequate food or ability to make enough money in the wage economy to meet their basic needs. This too is evidence of a decline in this self-sufficiency.

Ability to meaningfully practice Indigenous economy and livelihoods (terrestrial aspects):

1. In the RSA of Okanagan Territory, our traditional livelihoods centred around seasonal rounds in large, well-known and well-stocked with wildlife, areas in territory. Seasonal rounds have reduced radically in frequency and extent (length of harvesting trips), across large areas of Okanagan territory since contact, and the other critical factors have also reduced in abundance. In addition, our trade economy has been severely impacted.
2. In the LSA at Revelstoke Dam, due primarily to previous Revelstoke Dam effects on the natural environment both upstream and downstream, there has been a reduction in the ability to meaningfully practice indigenous livelihoods at this location.
3. PIB reports previous impacts at the SCS location, but that the area still has moderate to strong indigenous livelihoods values in the pre-Project Case.

Ability to harvest adequate quality and quantity of traditional foods and medicines (terrestrial aspects):

1. In the RSA of Okanagan Territory, caribou, beaver and other harvested species have declined precipitously in numbers and distribution since contact. Okanagan members have raised some concerns about quality of country foods associated with contamination and increased disturbance causing higher morbidity and mortality in harvested species. Dam-specific effects radically reduced the amount of habitat available (especially over-wintering lowlands) in much of the Columbia River Valley) since 1968.
2. In the LSA at Revelstoke Dam, due primarily to previous Revelstoke Dam effects on the natural environment both upstream and downstream, including the loss of critical habitat for ungulates, there has been a reduction in the ability to harvest from this location.
3. PIB reports previous impacts at the SCS location, but that the area still has harvest opportunities in the pre-Project Case.

Ability to meaningfully practice Aboriginal rights for traditional food and medicine harvesting:

1. In the RSA of Okanagan Territory, has reduced in practicality due to reduced land base (including large areas flooded by Hydro activities), reduce time on the land and inter-generational knowledge transfer reducing our members' ability to locate and procure the right food and medicinal plants, and in some cases, reduced faith in the quality of plants in areas of territory that are considered impacted by industrial change.
2. In the LSA at Revelstoke Dam, due primarily to previous Revelstoke Dam effects on the natural environment both upstream and downstream, there has been a reduction in the ability to meaningfully practice food and medicine gathering in this location.
3. PIB reports previous impacts at the SCS location, but that the area still has food values in the pre-Project Case.

Food security: Okanagan have long raised concerns about declining health and abundance of culturally important foods at the territorial level.[45] The evidence available from OKIB suggests that food security, especially country food security, is a major preoccupation for many Okanagan families. While comparisons to historic food security are difficult, it can be confidently stated that the majority of Okanagan families are concerned about food security and the majority of them would like to have access to more country foods. There are also gaps in food security for our members as against settler populations.

In addition, the lack of distributional equity of impacts versus benefits between Okanagan and settler culture has been one of the primary hallmarks of the post-contact era, one that has been accelerated in the Hydro Era. Okanagan members are acutely aware of the unfair loading of adverse effects on our ecology and way of life for benefits (cheap electricity) that, as Toller and Nemetz (1997, 5) put it "are decided in and received by communities hundreds of kilometres away in the Lower Mainland of BC and the US Pacific Northwest". This inequity in the distribution of impacts and benefits is a legacy issue that required redress in an era touting reconciliation.

What the evidence indicates overall is that cumulative changes to Okanagan terrestrial livelihoods-related values have had adverse cumulative effects on the ability of Okanagan to meaningfully practice their aboriginal rights. Many of these negative changes are directly related to, and have been extensively increased in geographic scope and magnitude, by actions by BC Hydro since 1968 in the Rev6 primary Project-affected area.

Overall, Okanagan terrestrial livelihoods and economy-related rights and associated "sufficiency factors" have been subject to multiple constraints over time since contact, have not been respected by settler culture, BC Hydro and the Crown in many instances, and despite recent

[45] For example, in Okanagan First Peoples 2008e.

strong efforts at retrenchment, are still in a pre-existing state of serious constraint in the pre-Project Case.

It is into this already adversely impacted terrestrial livelihoods context, and highly unbalanced wage economic relationship between Okanagan and settler culture, that the Rev6 Project is proposed.

7.4 Rev6 Project-Specific Effects Pathways on Syilx Livelihoods and Economy

Please note: Initial draft materials on operation of the Project and impacts on Okanagan livelihoods and economy are discussed here; the technical information is primarily from BC Hydro and still to be subjected to technical examination between the parties. Impact pathways identified below may not be comprehensive and are provided without prejudice; others may be identified as new information emerges. Final BC Hydro EAC application materials are required in order to complete the impact pathways delineation and subsequent impact characterization assessments.

This section identifies pathways by which the Rev6 Project will affect Okanagan terrestrial livelihoods and other economic values and indicators.

7.4.1 Project Impact Pathways on Syilx Livelihoods and Economy

Evidence of use and value to Okanagan in the Project-affected areas has been provided previously in Sections 2 and 3 and Appendices 1 (Revelstoke Dam) and 3 (Summerland Capacitor Station. The evidence provided shows that the Project-affected areas hold strong terrestrial connections, despite previous impacts, including from BC Hydro activities, in these areas.

7.4.1.1 Okanagan Terrestrial Livelihoods

Based on the information available to Okanagan at the time of drafting of this Part C report, the following Project-specific effects pathways are predicted for the Rev6 Project on Okanagan terrestrial livelihoods indicators:

Reduced ability to harvest food and cultural resources; and to practice and pass on Syilx laws and protocols: Syilx laws state that it is the responsibility of Syilx people to ensure the health of the land and abundance of its resources for current and future use of all Syilx people. The construction of the Revelstoke Dam and other dams along the Columbia River, have made it extremely difficult for Syilx members to uphold this responsibility. The construction of Rev6 will only further reinforce this and will incrementally add to the numerous effects that the dam and its operation has to the plants, animals and the natural systems of the Columbia Valley. During the

construction phase of the project, it is predicted that Syilx members will be less inclined to visit and use the areas where construction is occurring to hunt or to practice their laws and traditions.

Reduced ability to harvest adequate quality and quantity of traditional foods and medicines: Initial site surveys identified the capacitor station site as being important winter ungulate habitat. Construction of the capacitor station will further fragment the winter ungulate habitat range for moose, white-tailed deer and mule deer. Evidence of additional culturally important plant and animal species at the capacitor station site was noted and will be impacted by the operation of the capacitor station.

Reduced ability to meaningfully practice traditional economy and livelihoods: The construction of the capacitor station will involve clearing of forested land, introduction of towers and installation of electrical equipment, all of which are expected to generate high construction noise levels. This will undoubtedly disrupt and displace any animals using the area making it challenging to hunt/trap and engage in traditional economic activities near the site during the construction period. Further, clearing for the capacitor station construction could introduce noxious weeds, which would compete with native plant species.

The Revelstoke Dam area, the MCR and Upper Arrow Lake areas were used for fishing, hunting, berry picking and collecting plants for food and medicines. Ongoing dam operations translate to ongoing loss of access to certain areas for harvesting, alongside declines in culturally important food and medicine species.

Reduced return on effort (harvesting success): Construction noise and activities will decrease return on effort for harvesting in both respective LSAs for the duration of the construction phase.

Ability to access the land for cultural, health, spiritual and other traditional uses: The Revelstoke Dame, MCR and Upper Arrow Lake areas were used for fishing, hunting, berry picking and collecting plants for food and medicines. Ongoing dam operations translate to ongoing loss of access to certain areas for harvesting, alongside declines in culturally important food and medicine species. The SCS site will require clearing, which will permanently impact the accessibility of this specific site. Further, construction noise and operations could potentially lead to less use of the seasonal camp located just east of the capacitor station.

7.4.1.2 Okanagan Wage Economy

Based on the information available to Okanagan at the time of drafting of this Part C report, the following Project-specific effects pathways are predicted for the Rev6 Project on the Okanagan wage economy indicators:

Local employment opportunities consistent with Okanagan values: It is expected that 472 person years of employment will be created during the construction phase of the project. Although

the majority of the jobs are not consistent with Okanagan values of long-term, meaningful employment with opportunities for advancement, Okanagan members are nonetheless interested and poised to engage in training and employment opportunities associated with the construction phase.

Lack of beneficiation in the form of employment opportunities for Okanagan members would constitute an adverse effect unto itself for two reasons:

1. lack of impact equity—those who bear the brunt of effects need to get preferred access to compensatory/offsetting benefits; and
2. it would continue pre-existing differential ability to take advantage by vulnerable indigenous sub-populations versus the non-indigenous majority, increasing the gap between the haves and have nots and accentuating existing inequality.

Depending on the structure of workforce requirements, construction workforce employment could negatively affect Syilx peoples' ability to spend time harvesting and collecting medicines. The ability of Okanagan members to take advantage of any construction jobs is constrained by a number of barriers, which need to be addressed in order to ensure viable employment opportunities for Okanagan members.

Okanagan members also have concerns that the small amount of beneficial impacts they do encounter are likely to be less beneficial for them than is likely for other, non-Aboriginal populations, due to a variety of built in systemic hurdles to full engagement in the wage economy by the Okanagan and their members. This inability to take advantage, when compounded with Okanagan's status as the most sensitive receptors in the human environment (i.e., our members' high vulnerability to adverse spinoff effects from ecological loss associated with BC Hydro activities), means that there is a lack of impact equity in relation the Project as currently proposed. As such, it fails to adhere to the critical Okanagan laws of balance and "taking care of those who take care of the land".

7.5 BC Hydro Committed-to Mitigation Measures re: Livelihoods and Economy

BC Hydro has outlined a number of mitigation measures in the Economy section of their Environmental Assessment Application (SNC-Lavalin 2016x, p.89-92). These include:

- Mitigation Measure #5.2.1: Engage in collaborative planning through local and regional workforce training and planning initiatives to support alignment of recruitment and training initiatives
- Mitigation Measure #5.2.2: Enhance local and Aboriginal worker training and hiring

    - Benefits Enhancement Measure #5.2.2: Monitoring of local training and hiring
    - Benefits Enhancement Measure #5.2.3: Enhance training and hiring of Aboriginal workers
    - Benefits Enhancement Measure #5.2.4: Monitoring of Aboriginal training and hiring
- Mitigation Measure #5.2.5: Enhance procurement of materials, goods and services supplied by local suppliers
- Mitigation Measure #5.2.6: Monitor procurement of materials, goods and services supplied by local suppliers
- Mitigation Measure #5.2.7: Enhance procurement of materials, goods and services supplied by Aboriginal owned and operated suppliers
- Mitigation Measure #5.2.8: Monitor procurement of materials, goods and services supplied by Aboriginal owned and operated suppliers

A number of mitigations measures have also been suggested in Table 4.7-11 in the Mammals Effects Assessment Section (SNC-Lavalin 2016k). However, a residual effects assessment was not completed in the July 2016 draft.

In our view, the mitigation measures proposed for both Economy and Mammals are inadequate and would not effectively respond to the project impact pathways discussed above. We note as well that at the time of drafting this Part C report, BC Hydro had not completed an assessment of the effectiveness of their proposed mitigations, nor a cumulative effects assessment on Economy or Mammals.

Please note: Okanagan Nation and BC Hydro have not yet met to discuss required mitigation to reduce potential adverse effects from the Project, alone and in combination with cumulative effects causing agents (including prior BC Hydro actions). At any such meeting BC Hydro is invited to identify additional mitigation it believes will successfully avoid, reduce or compensate for impacts on Okanagan water values

In addition, Okanagan Nation will reserve judgment on assessment of Project-specific or total cumulative effects in the Project Case can occur until information and mitigation gaps are filled – such assessment and any discussion of it is premature at this time.

8. Okanagan Community Well-being

8.1. Introduction

A full consideration of Project-specific effects and total cumulative effects in the Project Case cannot be completed until: a. BC Hydro fills information gaps in the assessment materials it has provided Okanagan to date; and b. the parties meet regarding mitigation requirements.

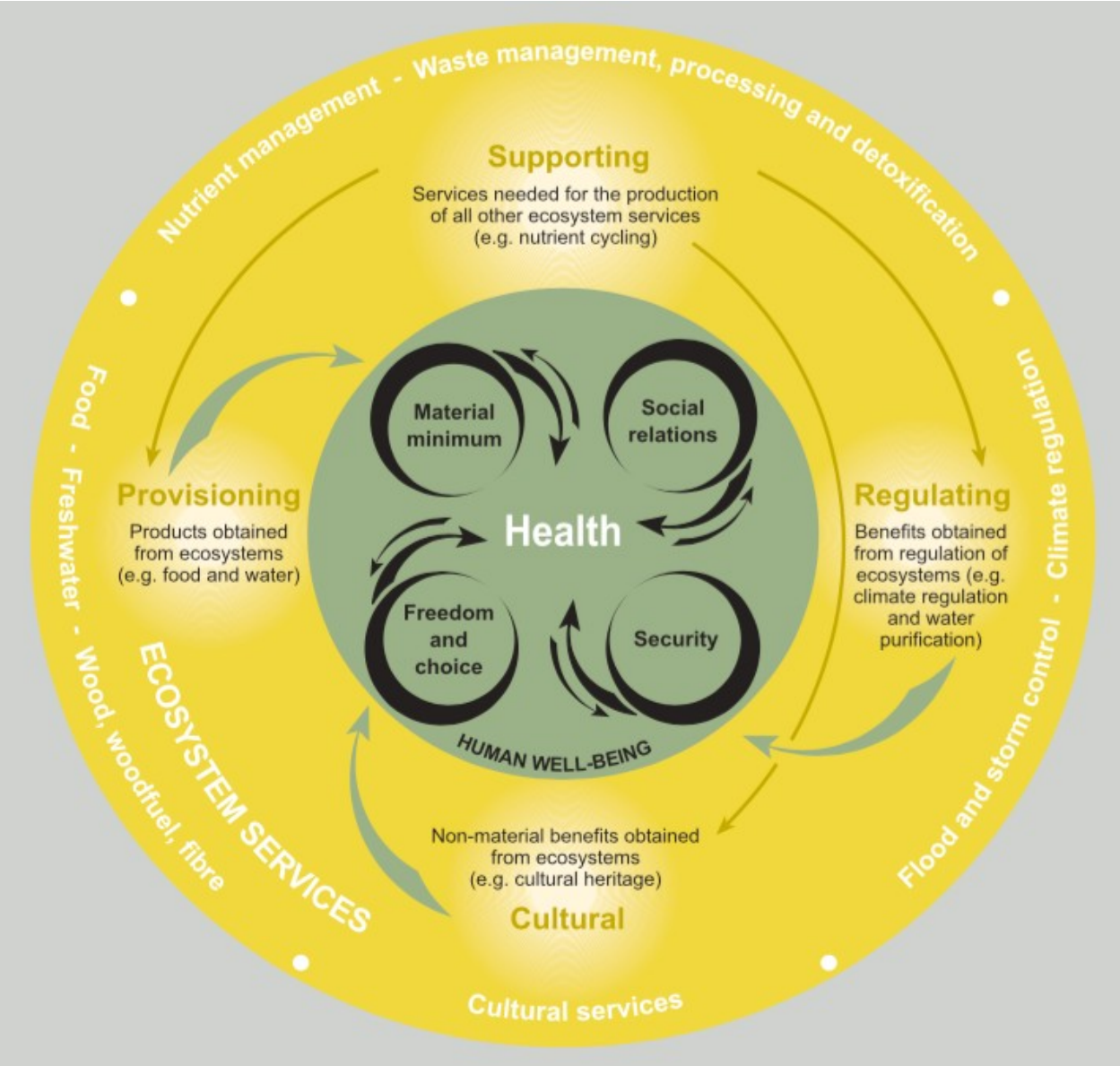
This final Okanagan VC section explores cumulative impacts to date, and potential future impact pathways from the Rev6 Project, on Okanagan community well-being. Given the strong connection of Okanagan members to their territory, there is by necessity a focus on the relationship between changes on the land and the health and well-being of Okanagan Nation communities. In an indigenous context, human well-being is tightly interconnected with the health of ecosystem and cultural values (MA 2005). As previously noted in Figure 1.1, changes to water, fish, culture and livelihoods (traditional economy), all filter down to impact on Okanagan well-being and quality of life. This section seeks to better understand some of these connections between changes on the land and waters and in the community, the status of this well-being, community well-being goals and aspirations of the Okanagan, and barriers and opportunities for the Okanagan to improve well-being and quality of life.

For the purpose of this baseline and trend-over-time analysis, community well-being is recognized as having both subjective and objective components, including “people’s physical, social, and mental conditions, the fulfillment of their basic needs and capabilities, and the opportunities and resources to which they have access” (King *et al*. 2013).

As Figure 8.1 (below) illustrates, there are strong associations between health, ecosystem services, culture and other aspects of human well-being. This diagram places health as the focal point of well-being. As the Millennium Ecosystem Assessment (2005) noted:

> *Human health is affected directly and indirectly by changes in ecosystems but also is affected by changes to other aspects of well-being. Lack of aspects of human well-being (i.e., material minimum, good social relations, security, freedom and choice) all can have health impacts. Health also can influence these other aspects of human well-being.*

Figure 8.1: Components and Indicators of Human Well-being



Source: Millennium Assessment (MA 2005)

8.2. Setting the Context

There are many different ways to measure community well-being. The department of Indigenous and Northern Affairs (INAC) developed the Community Well-Being Index (CWB), a tool to measure well-being across both Indigenous and non-Indigenous communities in Canada. The CWB employs a variety of socio-economic indicators in evaluating well-being, including: income, housing, education and labour-force activity. The data from Statistics Canada Census and National

Household Survey for each of these indicators is used to derive well-being scores for each Canadian community (by census subdivision or indigenous reserve), which can be used to compare well-being across communities and over time.

Nationally, there is a substantive deficit between First Nations and non-Indigenous communities, in which First Nations communities are scoring well below non-Indigenous communities across all indicators: income (25 points), housing (23 points), education (17 points), and labour force activity (16 points) (INAC 2011). This is true for B.C. communities as well. In 2011, the average score for B.C. Indigenous communities was 62, while the average score for non-Indigenous communities in B.C. was 81.

In comparison, OKIB communities (therein described as Okanagan (Part 1) and Priest's Valley) scored 74 and 77, respectively. WFN communities (therein described as Tsintikeptum 9 & 10) scored 78 and 82 respectively. PIB (Penticton 1) achieved a CWB Index score of 72. The CWB index scores are artificially elevated as a result of the high non-First Nations population that lives on these reserves.[46] As a result, these scores cannot be considered reliable for Okanagan Nation communities themselves. It is likely, therefore, that the CWB Index scores for Okanagan Nation members and communities are much lower than the reported numbers, indicating deficits not only against BC and national averages, but also in relation to their own non-indigenous neighbours.

In addition, the indicators of well-being chosen by INAC are narrowly defined and do not represent the complex socio-economic, cultural, health and ecological realities which define Okanagan community well-being. Well-being indicators are ill-defined and not agreed upon by the research community, especially when it comes to Indigenous community well-being. As such, there is no one model or index one can turn to in order to establish consistent, quantitative, methods of calculating community well-being across all communities and culture groups, as has been attempted by INAC. Rather, indicators of well-being must be identified on a culture group-specific basis.

The well-being of the Syilx people must be evaluated holistically, as it is the health of ecological, cultural, social, economic, health and governance systems that all play a role in community well-being. In addition, it is important that community well-being be defined within the cultural context of the Syilx, as discussed in the next section.

[46] To illustrate the scale of this issue, consider that only 28% of residents living on Okanagan Part 1 Reserve (OKIB) are 'Registered Indians', and there are no registered OKIB members living on Priest's Valley Reserve (INAC 2016a). The CWB Index score for WFN is based on a population of 7,068 residents, while current WFN membership sits at 870 individuals (more than half of which lives off-reserve) (INAC 2016b). Similarly, the CWB Index score for PIB is based on a population of 1,667; meanwhile, the registered membership of PIB as of December 2016 was only 1,071, more than half of which live off-reserve (INAC 2016c).

8.2.1 Syilx Indicators, Rights, and Laws and Norms Related to Community Well-being

For the purposes of this report, a suite of indicators of community well-being have been identified by the Okanagan Nation (see Table 8.1, below). From them, it is clear that the indicators discussed in this section must not be considered in isolation of the materials presented in the remainder of the ON's Rev6 Part C submission document. Indicators like access to clean drinking water, ability to access and manage the land for traditional purposes, and self-determination and adherence to traditional laws are all echoed in other VC-specific assessments.

Table 8.1: Key Indicators for Okanagan Community Well-being VC

Valued Component	Key Indicator/Measurable Parameter
Community Well-being	• Access to adequate, affordable housing that is in good condition • Physical and mental health • Access to clean drinking water • Safe and affordable transportation • Access to recreational facilities, community infrastructure and programming for people of all ages • Ability to access and manage the land for cultural, health, spiritual and other traditional uses • Self-determination based on traditional laws, practices and norms

Changes to Syilx well-being over time are considered herein through the lens of these culturally relevant indicators of well-being.

It is also understood that Syilx hold rights related to maintaining and improving their well-being, unceded at any time to the Crown. These rights are outlined in S.2.2 of this report. Adverse cumulative effects on Syilx rights contribute to reduced community well-being by undermining self-determination and connections to territory at the same time they undermine the resources and values that the Syilx way of life and rights practices depend on. These complex cumulative effects on community well-being are discussed further in Section 8.3 below. It is also worthy of note that some of the indicators herein, most especially "access to land…" and "self-determination…" are linked closely to Syilx rights. Impacts to these indicators are effectively constraints on those rights.

Okanagan laws, norms and guiding principles focus on respect, sharing and responsibility for each individual to contribute to and ensure the well-being of the community at large. Chief among the laws and norms important for community well-being is *balance, or* sktəɬəɬtan, is the foundation of

Okanagan existence— “all things, from the natural world, practices, human relations and all else, are interrelated and counterbalanced” (as stated in The River People, Coyote and Salmon Captikwl). In order to preserve sktəɬəɬtan, the guiding principle of suxʷxtəm is followed, where those who take care of the land are cared for themselves, in order to sustain diversity of species and their habitats in perpetuity for the well-being of future generations (Guiding Principles of Suxwtxtem, nd).

8.2.2 Key Elements of Syilx Community Well-being at Contact

All of the current Okanagan community well-being indicators have historical corollaries that were adequately met prior to contact.

Self-determination based on traditional laws, practices and norms: Prior to contact, Syilx were self-governing and complex mechanisms were set up to ensure community well-being and adherence to natural law. Traditionally, community well-being was the responsibility of the village chief and was closely tied to the ability of Syilx people to meet their needs through seasonal rounds and working together. An overview of Syilx governance structures is provided in section 2.4.2. The sophisticated, hierarchical structure of Syilx traditional society focussed on ensuring the well-being of all people. High Chiefs, *p’elk’mula?x*^{w}, Tribal Chiefs, *whawheylxw*, and Village Chiefs, *yilmixwem,* managed resources and relationships that fell within their respective jurisdictions. At the Village Chief level, this responsibility included ensuring that the laws of the village were kept to protect the well-being of the people into the future (Armstrong et al. 1994, 4). Other leadership roles in traditional Syilx villages included:

- *xatus*, heads of family clans who were responsible for keeping good relations between family members and other clans;
- *tlax tla kap*, the eldest of each household who was responsible for ensuring that the day-to-day work within their respective households was kept up; and
- *suxencwiltm*, refers to the ones who discipline and maintain law and peace within the village.

Despite being a hierarchical structure, Syilx governance was an iterative relationship between all levels of chieftainship and individual members as well. Individual members were responsible to the household heads and their village as a whole. “The responsibility of the individual to the whole village is central to the rights of the individual… Each member had a responsibility and a part in the way the whole Nation lived in health. They had a good system of day-to-day care of people in the community” (Armstrong et al. 1994, 5).

Access to recreational facilities, community infrastructure and programming for people of all ages: The whole of the natural world around them was Syilx’s “recreational facility”, but

systems were clearly in place for people to enjoy life and pursue their passions. Syilx traditional knowledge and stories emphasize the many ways in which life was good prior to contact:

> *The Syilx had no schools, jails, judges or police. No person ever went hungry while they ere part of a village. Rape or child abuse was unknown. People were strong and lived to be old and were free all their lives. Gathering food and everyday work was shared and there was lots of time to spend on creative and interesting things. The Syilx were great storytellers, artists, crafters, thinkers, singers, and musicians. They were the best of natural scientists and doctors. They excelled at sports and were extensive travelers. Our history shows all of this. —Armstrong et al. 1994, 6*

This looking out for one another, or social capital, is an attribute of **physical and mental health**. Other aspects of physical and mental health that were relied upon included the afore-mentioned self-governance, eating healthy country foods, living a mobile mode of life on the land and waters of Okanagan territory that promoted – indeed, required – physical exercise and self-reliance, and a strong cultural and spiritual connection to territory.

Access to clean drinking water was taken for granted and Okanagan members had ample opportunity and faith in "dipping their cup" into almost any Okanagan waterway. Contamination sources were extremely limited and completely avoidable.

Except for situations of conflict with other First Nations, Syilx had a largely unfettered **ability to access and manage the land for cultural, health, spiritual and other traditional uses,** prior to contact, as discussed further in Sections 2 and 7 of this report. Okanagan well-being is explicitly tied to the state of the natural world: "the land is at the center of how we are to behave" (Armstrong *et al*., 1994, 2). It is believed that the protection of the lands, waters and all living beings results in the protection of the coming generation.

Safe and affordable transportation was available via walking trails, horse trails (by the 1700s), and on multiple waterways via canoe. Given the importance of moving around to access seasonal foods and to trade with neighbours, traditional knowledge of transportation routes was widely distributed and passed from generation to generation.

Access to adequate, affordable housing that is in good condition was readily available as well. Historically, shelter was tied closely to the seasonal rounds that Okanagan people engaged in for their livelihoods – materials for the development of seasonally appropriate housing was readily available and free for the taking:

> *Okanagan dwellings were basically of two kinds, the underground winter 'earth lodges' and the summer lodges. The kikuli or underground houses (kwts'i) were dug out to the depth of about four to six feet in well-drained sandy soil. They were covered with a low conical roof made of a wooden frame covered with*

bark, grass, and soil, and the entrance was through an opening on the roof. Summer lodges consisted of both circular and oblong dwellings constructed out of a framework of poles covered with tule mats. The circular style was most common, and these huts were looked upon as the main domestic family dwellings. (Carstens 1991, 8)

8.3. Change over Time in Syilx Well-being

Life was not always easy for Okanagan prior to contact. There were times when food sources were not as readily available, and when conflict occurred with neighbours. None of the conveniences of modern life were available. However, all of the priority Okanagan community well-being indicators were readily accessible and in the control of the Okanagan themselves, prior to contact. This was to change over time.[47]

8.3.1 1930s to present: Syilx Community Well-being in the Hydro Era

Syilx customs, way of life and well-being were challenged by a variety of factors post-contact. Disease, depleting sources of protein in the form of elk, moose, deer, beaver and others during the fur trade era, introduction to alcohol creating community dysfunction, discrimination of many types, and residential schools all played a role in social and economic marginalization.

In the Hydro Era, the ecological changes caused by settler culture and their spin-off effects on Okanagan well-being, branched out more extensively from lands to waters. The construction of large-scale dams and irrigation canals in the Columbia River Basin during the 1930s had profound and nearly immediate consequences for social, economic and cultural institutions of the Syilx people. The Syilx people were seriously adversely affected when the Grand Coulee Dam project obstructed the migrations of five distinct salmon runs in the Columbia River Basin, effectively depriving the Syilx of their primary protein source (see Section 5 for details). Construction of the Grand Coulee Dam led to an ecological crisis in the Columbia River Basin, "that created social problems that included suicide and chronic alcoholism" (Sam 2008, 52).

The 1950s saw even further degradation to the natural water systems within Syilx territory, with the construction of a flood-control program that channelized the Okanagan River where it runs between Skaha and Okanagan Lakes. This major diversion had major ecological and social impacts to the Syilx people, primarily members of the Penticton Band, whose reserves are located in close proximity to the project-area. For example, Sam (2008, 66) found that "the degradation to

[47] For a more detailed set of factors that influenced declining community well-being after contact, see Sections 2.5 and 2.6.

the water systems within the confines of the Penticton Indian Reserve boundaries were identified as being a primary cause of past and contemporary social and cultural disparities as experienced within their families and community".

The Revelstoke area is discussed as an area of high spiritual and ceremonial value to the Syilx. One elder spoke of how Syilx people traveled throughout the Revelstoke and Upper Arrow Lakes area and the importance of ceremony as part of this travel:

> *"…they used to camp up there and do a lot of ceremonies up there before coming… that's where ceremonies started first and come down …It was a spiritual area. It was more spiritual then here in the Okanagan" (ON06, November 2016).*

In recent years, culture and hunting camps in the Revelstoke and Upper Arrow Lakes area have been supported by the Okanagan Bands in order to ensure that traditional knowledge of the area and associated language and ceremonies are passed on to younger generations. Notwithstanding these efforts, the development of the Revelstoke Dam, which also created a large reservoir to the north and an altered Mid Columbia River and Upper Arrow Lake to the south, has caused increased alienation of Okanagan people from this critical cultural area.

8.3.2 Okanagan Well-being Today

Well-being indicators have not been collected across all of the Okanagan Nation communities at the time of writing this report. As such, we will rely on data from the 2016 OKIB Socio-economic Baseline Study, as well as on available data from the 2011 National Household Survey (NHS), Statistics Canada and Li et al. (2016). *Note that further data collection on well-being and socio-economic baseline indicators is planned for the Spring of 2017 in the rest of the Okanagan Nation communities, at which point this assessment will require updating.*

While not all types of community well-being outcomes have been subject to rigorous assessment for Okanagan Nations' member bands, the following can be stated about the current status of community well-being indicators in the pre-Project Case:

8.3.2.1 Access to Adequate, Affordable Housing That is in Good Condition

Data on adequacy and affordability of housing are not available through Statistics Canada's online National Household Survey (2011) for any of the Okanagan Communities. As such, we have had to purchase custom data requests from Statistics Canada in order to better understand OKIB, WFN and PIB's demographic profiles. *At the time of drafting, custom data for WFN and PIB had not yet been made available.*

The OKIB socio-economic study (The Firelight Group 2016) does provide some indicators of housing adequacy, including the condition of the dwellings. Almost half (45%) of OKIB households on reserve reported the need for major repairs. This is much higher than the rates of 6.5% to 11% reported for nearby municipalities and 7.2% across B.C (Statistics Canada NHS Profile British Columbia, 2011).

Overcrowding was also reported as a major issue for OKIB households. Previous censuses have reported that the highest rates of overcrowding are among First Nations in Canada are those living on reserve at 26% and that 33% of First Nations on reserve live in inadequate housing (Monk 2013).

Without adequate housing, it becomes challenging to maintain various aspects of well-being. Specifically, it becomes difficult to retain employment, engage in education and training opportunities or care for ones' family. There are many negative trickle-down-effects for individual, family and community well-being.

8.3.2.2 Physical and Mental Health

While most Okanagan residents, British Columbians, and Canadians rate both their physical health (57%, 57% and 59%) and mental health (69%, 69.7%, 71%) as very good or excellent (Statistics Canada 2014), OKIB members paint a different portrait. In the OKIB study, only 29% rated their physical health as very good to excellent, while 56% reported their mental health to be very good or excellent.

Discussions about perceptions of physical and mental health and well-being were convened during focus groups with OKIB members. It was noted that getting out on the land and water and participating in harvesting and other cultural activities is important for mental health and well-being. Participants expressed that it is challenging to balance wage employment with traditional practices and demands, and people aren't getting out on the land as much as they'd like to. Concerns about contaminant levels in fish and game were also noted as causes for avoidance behaviours and poor physical health.

Sense of community belonging and support, as well as personal safety, are also important indicators of mental health and well-being. For OKIB members, 96% of study respondents indicated feeling safe or somewhat safe in their community, while 87% indicated that they had a high level of support, being able to call on more than two people in the community to help with problems (The Firelight Group 2016). This is somewhat higher than the rate of 78% for B.C. (Statistics Canada, 2013a).

NB: Information on perceptions of health for WFN and PIB is not available at the time of drafting. Data to inform this section will be collected in the socio-economic baseline studies planned to take place in the Spring/Summer of 2017.

8.3.2.3 Access to Clean Drinking Water

Drinking water quality is assessed at high risk for all water delivery systems on Okanagan Indian Band and Penticton Indian Band reserve lands according to the Guidelines for Canadian Drinking Water Quality (GCDWQ) (DIAND 2011). Westbank First Nation water quality was assessed as low-risk.

According to the federal government, systems ranking as 'high risk' have major deficiencies in the quality of water: "These deficiencies may lead to potential health and safety of environmental concerns. They could also result in water quality advisories again drinking the water…, repetitive non-compliance with guidelines, and inadequate water supplies" (DIAND 2011, 11).

The established guidelines for health quality of water were not met by any of the three Okanagan bands discussed herein (OKIB, WFN, PIB).

Not having access to reliable drinking water poses a major threat to community well-being for Syilx people. This extends into the time spent on territory, where reduced faith in water quality from area waterways and waterbodies has seen reduced willingness by Okanagan Nation members to drink water directly from the land.

8.3.2.4 Safe and Affordable Transportation

On OKIB reserve lands, transportation costs are a contributing stressor to income security. The community is spread out with distances between homes and services often more than 10 km apart. There is no available public or subsidized transportation on reserve or between the reserve and Vernon. OKIB Territorial Stewardship Division staff report that for some families, having their children attend youth programming or immersion school (K–7) on reserve is not a choice that they can take advantage of because of a lack of transportation. Instead, many children attend the Vernon school district, which supplies bussing. As reported later in the discussion on food security, many OKIB members are concerned that they are not able to provide an adequate, nutritious diet for their families or engage in harvesting (harvesting practices section) in ways that they would like to.

NB: Information on the current state of transportation for WFN and PIB is not available at the time of drafting. Data to inform this section will be collected in the socio-economic baseline studies planned to take place in the Spring/Summer of 2017.

8.3.2.5 Access to Recreational Facilities, Community Infrastructure and Programming for People of All Ages

Engagement in recreational programming and activities contributes directly to physical and mental health. There are many factors that can lead to lack of engagement in such activities, including lack of programming, infrastructure and facilities, as well as low incomes (Raphael 2002).

OKIB has a community hall (Head of the Lake Hall), where community events and limited recreational programming take place. Barriers to accessing this programming are primarily the result of lack of time, income and/or transportation (see previous section). In addition, OKIB has an early childhood education centre, featuring the *Language Nest* Nsyilxen immersion program, and a cultural immersion elementary school. The New Horizons building offers a space for Elders to get together for weekly dinners and other activities. Finally, the OKIB health centre offers access to community health nurses and other health and well-being-related programming.

PIB has a well-being centre that offers health and well-being-related programming to members of all ages. The Outma Sqilx'w Cultural School serves students from kindergarten to grade eight with a strong focus on Nsyilxen culture and language, and the Little Paws Children's Center offers infant, toddler and preschool care.

WFN offers a community services facility, the Sensisyusten House of Learning (K-6), Westbank Child Development Centre and a youth centre. WFN delivers programming to members of all ages "that facilitate a healthy, strong, and vibrant community while promoting physical, mental, emotional, and spiritual well-being" (WFN 2000). Recreation programs include yoga, boot camp, drop-in basketball and volleyball, ski and snowboard team, snowshoeing and hunting 101.

8.3.2.6 Ability to Access the Land for Cultural, Health, Spiritual and Other Traditional Uses

Engagement in Syilx traditional harvesting and cultural practices helps to strengthen peoples' connections to their territory and their Syilx identity. The connections between individual and community health among indigenous populations to cultural practicability, connection to the land base and traditional way of life on the land, as well as the ability to pass on traditional knowledge are well studied (Ganesharajah 2009; Garnett and Sithole 2007; see discussion in Section 8.3.3 below).

Getting out on the lands and waters of the territory and participating in harvesting and other cultural activities is important for mental health and well-being. Participants in the OKIB Socio-economic Baseline Study (OKIB and The Firelight Group 2016) expressed that it is challenging to balance wage employment with traditional practices and demands, and people aren't getting out on the land as much as they'd like to.

Government policy and industrial, agricultural and residential development have all contributed to reduced access to lands and resources. Barriers to accessing the land include privatization of property and physical barriers (fencing) that restrict access, the cost of travelling throughout the large territory, and concerns about contaminant levels in harvested fish, game and plants species.

Overall, access to the land is subject to extensive, primarily externally imposed, reductions over time, as described in further detail in Sections 2 and 4 through 7 of this report. Nonetheless, strong efforts by the communities to retrench and renew their cultural and harvesting practices on the land are still seen.

8.3.2.7 Self-determination Based on Traditional Laws and Norms

Self-determination based on traditional laws and norms can be described as the ability to make decisions on the use, stewardship and benefits of health land, air and water, while adhering to the natural laws passed down through generations. Syilx laws state that it is the responsibility of Syilx people to ensure the health of the land and abundance of its resources for current and future use of all Syilx people. The construction of the Revelstoke Dam and other dams along the Columbia River, are among the major factors that have made it impossible for Syilx members to uphold this responsibility. With each passing day, Syilx people are challenged more and more deeply on how to negotiate the disconnect they have from land-based decision making, resulting from colonization and land privatization. Evidence from sections 2 and 4 through 7 of this report suggests that cumulative effects on self-determination have alienated Syilx people not only from direct decision-making over land and resources in our traditional territories, but also from any form of meaningful shared decision-making with setter governments.

The cumulative effects to date seriously constrain the ability of Syilx people to adhere to the traditional laws and norms associated with the well-being indicators discussed above. The ability of Syilx people to adhere to the laws of sux^{w}xtəm and ensure the well-being of future generations has largely been put out of reach through colonization, land privatization and repeated and continued regulation and imposition of land use by government and corporations. Failing to adhere to Syilx natural laws and norms can bring disempowerment, shame and loss of identity to Syilx people. This in turn can substantially impact mental and physical health and well-being.

Although Okanagan people have faced continued adversity, members continue to work toward a model of independence with own sources of revenue. Self-determination in the today's society must still be balanced with the guiding principles learned and taught by our Syilx ancestors.

8.3.3 Discussion of Cumulative effects to Date on Okanagan Community Well-being

It is clear that extensive changes imposed on the Syilx people from contact through to the present day have impacted individual and community well-being over time. This section summarizes these cumulative changes and some of their implications on Okanagan well-being.

Syilx people are particularly concerned about the intersection point between land, culture and community well-being, both in identifying existing problems and looking for solutions.

> *Our relationship with our territory is so deeply part of our identity and culture as Okanagan that the Crown's denial of our Aboriginal title is reflected in social and economic problems. We suffer from drug and alcohol abuse, suicides, disease because the foods that our bodies spent years getting used to are no longer available, and poverty. As long as our Aboriginal title is denied, we cannot live the laws that we, and generations before us, hold as sacred.—Armstrong (2007)*

The links between cultural and governance loss and social dysfunction has long been known and its adverse outcomes have been researched both qualitatively (e.g. Alfred 2009) and quantitatively (e.g., Chandler and Lalonde 2007). Despite this, it is rarely considered in BC environmental assessment and project planning.

For example, the tangible aspects of well-being highlighted thus far, only scratch the surface of the most challenged aspect of Syilx well-being—to uphold the responsibilities of Syilx law to care for the land and ensure that balance of natural systems is maintained. To some, the perception is that Syilx people have failed to uphold the laws, which weighs heavily on both the mental and physical well-being of invested community members.

> *[My grandparents] talked about our importance in making sure that we as Syilx people are the ones that are ... are needed to take care of the land, for the health of the land. We used to be proud, take pride in saying that we are care takers of the land now when we say that it's pretty hollow. When we say we are Syilx and we are known as the caretakers of the land that's a pretty hollow statement now because of the things that they are not doing, their responsibility. The responsibility that we are ... is st'uk'uk'xixtet ... that responsibility is not when I hear persons say it's my right to hunt, it's my right to dig roots, it's my rights to pick berries, that's not really true. It's not your rights – it's your responsibility ... that's the difference.--ON01, August 2015*

Meaningful assessment of effects on indigenous well-being must therefore dig deeper than surficial indicators like those used in the INAC CWB Index.

Using a social determinants of indigenous health approach, as opposed to a Western Scientific Knowledge (WSK) biomedical model approach, research indicates strong connections between two main factors to Indigenous community health and well-being. The first is self-determination and the degree of autonomy and control over ones' own territory and future. In the B.C. context, connections have been drawn between the degree of self-determination (measured across a variety of factors) of Indigenous peoples and the most adverse possible health outcome—suicide. Chandler and Lalonde (2007) found consistent evidence of an inverse relationship between self-determination and suicide amongst First Nations in B.C.[48] Further, "self-determination has been cited as the most important determinant of health among Aboriginal peoples" (Reading and Wien 2009, 23). According to their study, *Health Inequalities and Social Determinants of Aboriginal Peoples' Health,* self-determination is described as Aboriginal peoples participating equally in political decision-making, as well as possessing control over their lands, economies, education systems and social and health services.

Issues consistently raised by Canadian indigenous peoples, including many Okanagan members, regarding lack of self-determination and control over one's own future include:

- Feelings of inevitability re: major projects proposed on territory – lack of ability to affect the decision making processes;
- Lack of respect for indigenous peoples' input in planning processes (sometimes called "tick the box" consultation);
- Lack of respect for indigenous governments and forms of governance;
- Downgrading of and lack of serious consideration of aboriginal traditional knowledge, worldviews and laws and norms vs. western scientific knowledge;
- Lack of meaningful input at the provincial and federal government decision-making levels; and
- Power imbalances vs. settler culture, and associated sense of powerlessness to effect change.

The health implications of these feelings of lack of control are quite clear in the literature and can be catastrophic for individual health outcomes (Chandler and Lalonde 2007; 2008). This report has shown that in any number of ways, many of these factors have been eroded away from the grasp of the Okanagan.

The second critical factor in Indigenous well-being is the degree of connection to and identification with ones' traditional territory. For example, research (Ganesharajah 2009) and our lived experience in the Okanagan demonstrate that connections exist between individual and community health to:

[48] In other words, aboriginal communities which had high levels of self-determination and control over their own lives, had lower suicide rates than communities where self-determination and control levels were lower.

- Cultural practicability;
- Connection to land base and practice of traditional mode of life on the land;
- Self-determination and autonomy (as per above);
- Ability to practice and pass on intellectual traditions – worldview, language, stories;
- Spiritual connection to land base and elements; and
- Practice of traditional resource stewardship and governance; time spent “caring for country” (Garnet and Sithole 2007).

Depending on the degree of health of the above factors, research has shown community well-being outcomes such as:

- Excess morbidity and mortality;
- Reduced social and emotional well-being;
- Perceptions of individual and community healthiness (e.g., lower self-assessed physical and mental health status);
- Reduced connections between generations and reduced passing down of traditional knowledge; and
- A variety of dysfunctional coping strategies such as alcohol abuse and higher rates of violence and incarceration, among other adverse effects.

Okanagan members have been subjected to many of these adverse outcomes since contact and are still feeling their effects today.

Prior sections of this report have shown that connection to country – to Okanagan territory – has been subjected to enforced reductions for our members over time since contact. Our members suffer from many of the effects outcomes associated with this reduced connection (and the aforementioned loss of control and governance), and solutions will need to address these underlying factors and not merely the surface indicators.

Alterations to a variety of Syilx well-being indicators have occurred as a result of changes since contact. Many of these adverse cumulative effects have decreased the resilience and increased the vulnerability of Syilx people to withstand additional change to well-being indicators discussed in this section.

Not only do cumulative effects to date adversely affect Syilx ability to withstand further change to well-being indicators, but they also impact our members’ ability to adhere to our natural laws, norms and guiding principles. One of the principles of most relevance to our peoples’ well-being is suxʷxtəm, which can be roughly translated to “taking care of people who take care of the land and sustain diversity of the species and their habitats in perpetuity for the well-being of future

generations". Implicit in suxʷxtəm is the need to make sure that Okanagan people, who are the primary stewards of the land and waters, our relatives, are healthy enough to be able to live up to our responsibilities. However, in recent years both key aspects of suxʷxtəm have been eroded. The ability to "take care of the land" has been usurped by the Crown, settler landowners and industry. There is very little role for Syilx to play in today's management regime, seriously impacting our ability to adhere to this fundamental principle of well-being. Secondly, our people have been both alienated from the land and reduced in mental, physical and spiritual ways; make us less able to meet our sacred responsibilities. The well-being of Syilx people is intricately connected to the health of the lands, waters and species that inhabit them.

The very act of caring for the land to sustain diversity is what constitutes well-being, at its core. Our ability to take care of our natural resources and to therefore take care of ourselves, our families and our communities, has been majorly constrained since contact.

It is into this already highly altered and vulnerable context of Okanagan community well-being that the Rev6 Project is proposed.

8.4 Revelstoke 6 Project-Specific Effects Pathways on Okanagan Community Well-being

Please note: Given that effects on community well-being are related to other impacts on water, fish, culture, traditional livelihoods, and economy, it is premature at this time to assess Project-specific and total cumulative effects on community well-being. Impact pathways identified below may not be comprehensive and are provided without prejudice; others may be identified as new information emerges. Final BC Hydro EAC application materials are required in order to complete the impact assessments associated with each of the above-noted VC, prior to completing this assessment of effects on community well-being. Okanagan Nation will reserve judgment on assessment of Project-specific or total cumulative effects in the Project Case can occur until information and mitigation gaps are filled – such assessment is premature at this time.

Based on the information available at the time of drafting of this Part C Report, a variety of Project-specific effects pathways have already been predicted for the Rev6 Project on Okanagan water, fish, fishing, cultural, and livelihood and economic valued components in Sections 4 through 7. Some of these effects pathways will also influence Okanagan well-being indicators. These include but are not limited to:

- Reduced mental health due to reduced connections to MCR and SCS locations;
- Continuation and exacerbation of Okanagan alienation from clean water sources on territory due to concerns with water quality, especially at MCR;

- Reduce real and perceived sense of safe transportation, particularly by boat in the altered and unpredictable MCR;
- Reduced ability to access and manage the land for cultural, health, spiritual and other purposes at both Project locations, due to disturbance from physical activity levels, building of new structures on Okanagan territory, and increased sense of physical risk and loss of quiet enjoyment of the land for Okanagan land and water users; and
- continued and increased alienation of Okanagan decision-making and ability to adhere to natural laws and resource stewardship responsibilities.

Please note that the above list is preliminary and Okanagan reserves the right to update it based on updated information from BC Hydro about the Project and its effects potential.

8.4.1 BC Hydro Committed-to Mitigation Measures re: Community Wellbeing

To the knowledge of Okanagan Nation and its members, BC Hydro has identified no mitigation related to reduction of effects on Okanagan community well-being in relation to the Rev6 Project, that would reduce, avoid or offset/compensate for, either Project-specific or cumulative effects. If *BC Hydro has a list, please provide for Okanagan consideration in the pre-Application consultation period. Okanagan Nation and BC Hydro have not yet met to discuss required mitigation to reduce potential adverse effects from the Project, alone and in combination with cumulative effects causing agents (including prior BC Hydro actions). At any such meeting BC Hydro is invited to identify additional mitigation it believes will successfully avoid, reduce or compensate for impacts on Okanagan water values.*

Without mitigation, Rev6 will likely add adverse effects to already heavily damaged well-being indicators. Based on the evidence currently available, adverse changes are likely to occur as a result of the Project on the following Okanagan well-being indicators of particular concern:

- Ability to access and manage the land for cultural, health, spiritual and other traditional uses; and
- Self-determination based on traditional laws, practices, and norms.

The Project will contribute to the continuation of already existing adverse cumulative effects on these indicators. Given the importance of these two indicators to overall Okanagan community well-being, they are critical to improve in order to make Okanagan communities and people more resilient in the face of multiple historic and ongoing changes.

As noted above, the Rev6 Project – and BC Hydro in general – also has not identified any offsets to improve already seriously adversely affected elements of Okanagan well-being. The Project as proposed will thus not improve the status of any of the community well-being indicators**,** and therefore we must find that, in the Project Case with the Project as currently proposed and without

additional mitigation, existing adverse cumulative effects on Okanagan community well-being will likely persist, indeed deepening when what is needed is improvement.

Development in Okanagan territory needs to recognize the principles of balance, inter-generational equity, and impact equity (those who are most likely to be adversely impacted by a Project merit commensurate offsetting benefits). Community well-being is our social safety net; it provides the protective structures to increase resilience in the face of cumulative adverse changes from many directions, and to which BC Hydro has contributed so much.

Given the state of high vulnerability of Okanagan community well-being, net improvements, not merely the avoidance of extensive further harm, is the only path to reconciliation. The Project as proposed does not currently meet this test and as currently proposed will instead:

1. Contribute to the continuation of the cyle of loss of Okanagan well-being; and
2. Not contribute any beneficial counter-balancing beneficial effects to Okanagan people to offset and improve community well-being.

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Appendix A: Syilx (Okanagan) Connections to the Columbia River

Introduction

In 2015 the Okanagan Indian Band decided to participate in BC Hydro's environmental assessment for the proposed sixth turbine generator to Revelstoke Dam, within the BC Environmental Assessment Office (EAO) process. A deciding factor to become involved in this process hinged on a stipulation that this research would naturally lead into a more extensive research program with hopes of properly illuminating the relationship between Syilx (Okanagan) and the Sinixt (Arrow Lakes) and how all came to be.

The focus of the research described herein is the understanding and articulation of the relationship that the Okanagan have with the area likely to be impacted by the Revelstoke 6 Project.

For the Okanagan Indian Band this research is desired to be the foundation of a broader research program that will serve as the backbone to the development of an Okanagan-inclusive monitoring and management plan that will span the lifetime of the regulated hydrological regime that is the Columbia River in BC, and its surrounding terrestrial environment, critical portions of Okanagan territory since time immemorial.

Methods

This Appendix demonstrates a number of ways the Syilx people are connected to the Columbia River particularly the snkxyknt̓n (Revelstoke) area. The culturally appropriate method chosen to do this was to translate a Columbia River Captikʷɬ and to explain the relationship between the Syilx people and the Captikʷɬ. The story was chosen as a result of a research trip to Revelstoke by traditional knowledge holders.

An initial meeting between the technical staff and an Okanagan Syilx scholar and language speaker was held in 2015. At this meeting, it was decided to conduct a research trip to Revelstoke with a group of language speakers that have specialized knowledge regarding the area, to begin the development of the Okanagan Nation submission of a Section C Report for the environmental assessment Application, first to BC Hydro and then to the EAO. Given that Syilx values are embedded in the natural landscape, a site visit was necessary in order to identify the cultural significance of the Revelstoke area to Syilx.

The purpose of the site visit was to make the required connection to this portion of the Syilx cultural landscape in order to identify and discuss Syilx stories, place names, and protocols that are embedded within the Revelstoke area. At the site visit, Nsyilxcen speakers, cultural advisors, and technical staff worked together to define and determine what cultural information can shared in Section C and in what format.

The Revelstoke research trip that included a visit to the Revelstoke Dam, Glacier National Park and the village site across the river from the Revelstoke (archaeology site). The research trip took place August 17-19, 2015:

- August 17th the group of fourteen attended a Revelstoke Dam tour.
- August 18th the group of fourteen visited the village site on the west side of the bridge.
- August 19th the group of twelve visited Glacier National Park.

Two day attendees:

- Victor Antoine, Nkmepleqs (OKIB)
- John (Wilkie) Louie, Nkmepleqs (OKIB)
- Arnie Baptiste, Snpinktn (PIB also representing WFN)
- Richard Armstrong, Snpinktn (PIB/en'owkin also representing WFN)
- Pierre Kruger, Snpinktn (PIB)
- Tim Lezard, Snpinktn (PIB)
- Rob Edward, Sc'u7paq' (LSIB also representing WFN)
- Kathy Holland (ONA)
- Wendy Hawkes, Sc'u7paq' (LSIB)
- Dallas Good Water, Nkmepleqs (OKIB)
- Nancy Bonneau, Tsintskeneptm (WFN)
- Lindsay Louis, Nkmepleqs (OKIB)
- Stephanie Paul, Tsintkeneptm (WFN)

One day attendees:

- Dan Wilson, Nkmepleqs (OKIB)
- Fred Louis Nkmepleqs (OKIB)[49]

[49] Also deserving of acknowledgement in this process, are Colleen Marchand, Jeannette Armstrong, Bill Cohen, Julie Richard, Raf DeGuevara, and Carrie Terbasket.

During the three days English and Nsyilxən conversations were digitally recorded by phone and Zoom 4HN. Technical staff recorded conversations that were subsequently transcribed by the individuals' respective organizations. For instance, Lindsay Louis transcribed recorded English conversations that she recorded. The Nsyilxən conversation that Nancy Bonneau and Stephanie Paul recorded Arnie Baptiste is translating into English. The information derived from the Revelstoke field trip will be used to inform the Okanagan Syilx response to the Section C Environmental Assessment for the Revelstoke 6 turbine installation.

At meetings subsequent to the field trip, it was decided that the Syilx response for Section C should include a captikʷɬ that Arnie Baptiste has personal knowledge of, and has chosen to share, that will address the Revelstoke area/Columbia River. In addition, a written description of the purpose of Captikʷɬ by an Okanagan Syilx scholar is also included in the Preamble, on p.11 of this document.

In addition to the primary Captikʷɬ put forth for the purpose of this Part C in the Preamble, a second Captikʷɬ was told and recorded by Arnie Baptiste.

Other Syilx Language Speaker Accounts from Site Visit: Laws and Norms to Protect All Life

March 2016

Ceqcaqalxgn

AKA: Arnie Baptiste

> *[Our stories are] dictated to us "Human Beings "through our ancestral lineages. Environmental accountability and responsibility lies solely with in the collective hands and minds of the People. Their interactions with the "Land" have always been an interaction that is honorable and respectful, guided by, entrenched and etched in the sub-conscience mind of the people through the great legends and stories told for generations by the River People. Stories of wonderful and amazing occurrences have always been delivered by soft flickering glows from a central fire, which is where we – the River People – get these present accounts and rely so heavily on this information from the past for future strength and continuity.*
>
> *Land – as our two great nations believe – has always been there for the people with life- giving gifts. All of the gifts come as food, medicine shelter protection from the elements etc. These kinds of beliefs that a wilderness area seemingly*

desolate and isolated from any kind of manipulated development is capable of continuously delivering a population of humans into not just sustainable and flourishing life but also helped these long-term living home-base communities continue to maintain a high level of well-nourished and healthy community members and all of them (communities) were thriving. Stories and legends were told of how the people gathered by the thousands at any times of harvests. Fish, Deer, Roots – all of the gifts were so plentiful that the proverbial cornucopia was a never-ending flow of sustenance.

These were also the findings of the newcomers to the place, which in their heroic tales and historical literature they recorded as being a place they "Discovered". These new-comers were amazed at the level of pristine land they were witnessing. They were absolutely amazed at the abundance of wildlife, waterfowl, water creatures and the list goes on. There is a well known quote: "A person could walk across this river on the backs of those fish".

The People knew that there was a very important place that each and every living thing had in the circle of life. This concept served a valuable balance to the understanding: "The more you take the less others will have". Within all of the River Nations' governance acts, were some very important and well structured Protocols. Each of the protocols maintained balance between the natural world (the environment), the community, and on to the nation and out and on to other tribes or nations.

These protocols maintained a very healthy way of life for each and every blade of grass [up] to the largest of animals and plants. The vastness and abundance of land which was seemingly endless had living, growing, developing and very specific times of maturity, availability, development, growth. The protocols ensured that there was always a connection to the maintenance and balance of the very powerful yet delicate thing we call life, and [recognized] how fragile life really can be. As stated earlier, if there is too much of anything taken from one place then eventually there is depletion or suffering around that area. It is just simple mathematics or even common sense.

Potential Impacts of Rev6

In the case of the Rev6 turbine installation, the temperature change and the 24 hour vibrations generated by the continuous turning and working of the engines, gears, shafts, pulsating electricity

and the list can go on, are just a couple of very major conditions that is causing concern and having an ecological and environmental effect and those effects are going to be multiplied by Rev6.

Noise alone generated through water is piercing and violent. Back that up with continuous humming and whirring, major damages happening. Even if the effect is considered minimal at best that is only for the immediate future it has nothing to do with the long term.

The long term effects of any and all developments are the major focused reasons native people demand that attention be given to development of any kind which happens on the rivers, out on the land, the marshes, wet lands, minor and major tributaries these are all effected by the raising and lowering or changing the speed of a waterway. Too slow things settle. Too fast thing wash away. Too deep is too cold.

There are reasons why all living things have, ears, noses, senses etc. These attributes are very delicate and highly tuned navigational systems. Uninterrupted or hindered in any way over the millenniums these attributes provided life with a way to maintain its course on the path of existence. Since the introductions of any and all kinds of developments, the whole ecological environment has been impacted in one way or another. In many cases the effect of seemingly simple developments has been devastating and irreversible.

We can cite and show the locations of the areas where development has had a negative impact and yet we are always told: “No worries it is only minimal”. Well no one has told or said anything to the fish. No one told the fishermen and fisherwomen that there may or may not be any fish or salmon for their children.

The community members who venture out on the land to gather, harvest and resupply their food or medicine caches see the devastation. But many government employees, bureaucrats, electrical plant or dam engineers, and local office workers – those people may be obligated to their jobs and in some cases or many cases support at all cost any development that is going on. [But] they do not see what these [Okanagan] members or families see! In far too many cases it is a sight that is heartbreaking because it reaches out way farther than just the area around the developed area. In this case this case it (Rev6) is going to have an effect up and down the great and powerful river and lake areas.

Vision for the Future

Community members identified the following aspirations for the future of the Project-affected area:

- Healthy Sturgeon population;
- Long-term Salmon restoration, reintegration into the Columbia River system in Canada; and
- Introduction of fish ladders.

Appendix B: Okanagan Nation (Syilx) Water Declaration

Syilx Nation *Siwɬkʷ* Declaration

Water is life.
Water is our relation.
Water bonds us to our ancestry, our descendants and our land.
July 31 2014
ONA AGA Spaxomin, BC

SIWɬKʷ - WATER

siwɬkʷ is a part of us and a part of all life.

siwɬkʷ must be treated with reverence and respect. Our relationship with *siwɬkʷ* is not taken lightly; we are responsible to ensure that our relation can continue to maintain the health and resiliency of our *tmxʷulaxʷ* and *timixʷ*.

siwɬkʷ is the lifeblood of our *tmxʷulaxʷ* and our *timixʷ* and we as Syilx People recognize *siwɬkʷ* as a sacred entity and relative that connects all life.

siwɬkʷ comes in many forms and all are needed for the health of *tmxʷulaxʷ* and for the *timixʷ*.

siwɬkʷ is our most sacred medicine: *siwɬkʷ* nourishes, replenishes, cleanses, and heals. Any use of *siwɬkʷ* should be an act of reverence and a commitment to our responsibilities to all life: now and to come, as Syilx People.

siwɬkʷ comes from the sky and the highest places yet it never willfully rises above anything. It will always take the lowest path in its humility, yet of all the elements, it is the most powerful.

Our sacred *siwɬkʷ* water teaches us that we have great strength to transform even the tallest mountain while being gentle, soft, and flexible.

siwɬkʷ will always find a way around obstructions: under, over and through. It teaches us that anything is possible.

siwɬkʷ movements, pathways, resiliency and power teach us who we are and who we can be as people.

RESPONSIBILITY

Our sovereign, unceded right to self-governance and self-determination are affirmed within our Syilx Laws and customs as dictated through our captikʷɬ. Self-determination includes the right to control our institutions, territories, social order and cultures without external interference or domination. The Syilx Nation is a sovereign Nation and we have governed our lands under Syilx Laws, customs and Syilx institutions since the beginning of time.

Our sacred *siwɬkʷ* connects and sustains all life. We as the Syilx people have a duty and responsibility to ensure *siwɬkʷ* can maintain all of its relationships, known and unknown, by showing due respect and humility.

When we were created, a covenant was made that we, as Syilx People, were required to act as caretakers of our lands and in return we would be looked after, our captikʷɬ teach us these values, this is our *stɬtaɬt*, Aboriginal Title and Rights.

Stɬtaɬt is an unchanging truth; it is a responsibility of reciprocity that the Syilx people continue to honour, exercise and act upon.

Our yəlyílmixʷm, Chiefs, leaders and all Syilx peoples have a responsibility to our homelands. This obligation cannot be given away; it is the foundation of who we are as a Tribal People, and of our continued existence on this land.

Our responsibilities are an unchanging truth that will continue to be upheld through our Syilx knowledge, understanding, and worldview throughout our Territory.



RELATIONSHIP

Syilx peoples assert that *siwɬkʷ* has the right to be recognized as a familial entity, a relation, and a being with a spirit who provides life for all living things. *Siwɬkʷ* must be treated with honour, respect and reciprocity. We care for, protect and honour our relationship and bond with *siwɬkʷ* through our Syilx Laws, customs, traditions and practices.

siwɬkʷ is not a resource or a commodity.

siwɬkʷ is central to our ceremonies and holds a sacred place within our spiritual teachings. We and future generations will continue to honour the water spirits in our ceremonies, governance structures, and daily lives.

As life givers, women have a sacred relationship and connection with *siwɬkʷ* that must be acknowledged and respected. Women hold *siwɬkʷ* as a precious and sacred gift in which our children are nurtured and brought into this world. Women hold a deep understanding of *siwɬkʷ* that is reflected in all of our hearts, our Indigenous creation stories and from time immemorial.

WHAT WE SEE

All life requires *siwɬkʷ* and yet our *siwɬkʷ* supplies are quickly becoming over allocated, abused and polluted. Challenges related to *siwɬkʷ* quality, access, quantity, use and allocation have become more prevalent within Syilx Territory. *siwɬkʷ* is not being respected under externally driven government regulations and management conditions. Syilx People question not only the provincial and federal government's decision making authority related to the use of our *siwɬkʷ* but also their practices.

Our lands and *siwɬkʷ* have been grossly mismanaged by these external entities which has resulted in ecosystem degradation, severe water quality deterioration, extreme stress upon local ecologies and species loss at a scale and rate which is unprecedented. We see that our waters are being dramatically over licensed, mismanaged and polluted. We see improper uses for water through: energy production, mining, dams, diversions, over allocation/exploitation, recreational development, wastewater dumping, unsustainable economic development, pesticides, herbicides and disease.

Broad issues associated with climate change, energy demands, increasing population and "economic sustainability" have devastated our forests, dammed our rivers and exploited our relative, *siwɬkʷ*, in ways the Syilx peoples would have never thought possible.

We see increasing need and an ever hungry western-economic engine demanding more of our *siwɬkʷ*. The narrow minded focus of western-scientific approaches to 'resource' extraction and management have utterly failed to protect our sacred *siwɬkʷ*.



The Syilx have implemented our knowledge systems and occupied this land since time immemorial. In but a fraction of that time, the western-scientific approach to management has decimated our environment using untried, untested and ineffective management methodologies.

The *siwɬkʷ*, *tmxʷulaxʷ*, and all living things are all intricately connected, *what you do to one you do to all*.

NXʷELXʷELTANTET – THAT WHICH GIVES US LIFE

The Syilx People affirm our relationship with our *tmxʷulaxʷ* and responsibility to future generations to raise our voices and speak for the protection of our *siwɬkʷ*. We are resilient, strong and resolute; deeply rooted in our lands and flowing with the *siwɬkʷ* that we have lived in harmony with since the beginning of time.

We were placed in a sacred manner upon this earth and charged to care for and protect all of our relations within our homelands especially our most sacred relative, *siwɬkʷ*. These responsibilities were given to us by the Creator, *K̓ʷuləncútn* and they have been upheld since the beginning of time by our ancestors. They now pass to us through our grandmothers and grandfathers.

Syilx Peoples have a deep intrinsic and spiritual relationship with our relative *siwɬkʷ*. Maintaining the integrity of *siwɬkʷ* and respecting its relationship to all life is essential to our identity as Syilx People and is entrenched in our responsibility to our homelands.

STɬTAŁT ABORIGINAL TITLE AND RIGHTS

The Syilx Nation governs our lands and *siwɬkʷ*. Any external process for any proposed use of *siwɬkʷ* or lands within our homelands must be premised on our unextinguished Syilx Aboriginal Title and Rights, which includes the right to decide how the lands, *siwɬkʷ* and resources of our Territory will be used. Any activities within and around our *siwɬkʷ* will be led by the Syilx Nation and carried out with the participation of Syilx Nation members in accordance with Syilx Laws, customs and practices. The province of British Columbia and federal government have notice of our Title and Rights.

The provincial and federal governments do not have jurisdiction or ownership of lands and resources within Syilx Territory.

ʔ KʷU_SYILX ʔ SIWɬKʷTƏT – OUR SYILX WATER

Syilx Peoples have inherent and implicit Aboriginal Title, Rights and Responsibilities to *siwɬkʷ*.

Syilx People must be at the forefront of all *siwɬkʷ* planning, *siwɬkʷ* protection and *siwɬkʷ* operational processes including allocation and generation.



Through the guidance of *k̓ʷuləncútn* we accept our sacred trust to protect our *siwɬkʷ* and fully express our Peoples jurisdictional authority and responsibilities to protect and respect our relative *siwɬkʷ*.

We stand united and will apply and implement our Syilx knowledge, Syilx laws, Syilx customs and Syilx self-determination to preserve, conserve and protect life's most sacred gift – *siwɬkʷ*.

We, the Syilx Peoples will survive and *continue to govern our mother and her resources for the good of all for all time…*



Appendix C: Penticton Indian Band – Okanagan (Syilx) Traditional Ecological Knowledge Keeper (TEK) Assessment

Penticton Indian Band – Okanagan (Syilx)

Traditional Ecological Knowledge Keeper (TEK)

Assessment with respect to a BC Hydro proposed Summerland Sub-station in association with Revelstoke 6

"Syilx" translated as a command to be intertwined with all things.
A Syilx primary directive and first laws is; Not to think of ourselves or selfishness,
as humans, we are directed to live in peace and harmony with the natural world;
to continue to give those yet to be have the best chance at survival.
The essentials requirements for life is
clean water, clean air, healthy food, shelter, safety and climate/temperature.

Introduction

NOTE: The Supreme Court of Canada in the Tsilhqot'in case has confirmed that the province and Canada have been applying an incorrect and impoverished view of Aboriginal Title, and that Aboriginal Title includes the exclusive right of Indigenous People to manage the land and resources as well as the right to benefit economically from the land and resources. The Court therefore concluded that when the Crown allocates resources on Aboriginal title lands without the Indigenous peoples' consent, it commits a serious infringement of constitutionally protected rights that will be difficult to justify.

This report does not:

- *limit, alter, fulfill or partially fulfill the Crown's duty to consult and accommodate PIB, any other Okanagan community, or the Okanagan Nation or Syilx People in relation to any decision to issue any permit, licence or other authorization in relation to BCH's activities or operations in Okanagan Territory;*
- *provide PIB, any other Okanagan community, or the Okanagan Nation or Syilx People's consent to any BCH activity or operation nor any Crown decision to issue any permit, licence or other authorization in relation to BCH's activities or operations in Okanagan Territory;*
- *provide justification of any Crown infringement of PIB, any other Okanagan community, or the Okanagan Nation or Syilx People's aboriginal title or rights; or*
- *limit, alter, fulfill, or partially fulfill any need or requirement for BCH to engage and reach understandings with any other Okanagan community, or the Okanagan Nation or Syilx People regarding its operations in Okanagan Territory.*

This partial Part C submission to BC Hydro's Environmental Assessment Application for the Revelstoke Generating Unit 6 Project has been prepared by the Penticton Indian Band specifically for incorporation into the broader Part C submission being submitted and prepared by the Okanagan Indian Band (OKIB) on behalf of the Okanagan Nation (ON) with support from the Okanagan Nation Alliance (ONA), Westbank First Nation (WFN), Penticton Indian Band (PIB) and the Firelight Group (Firelight). This report has been generated as a result of BC Hydro's intent to develop a capacitor station to support a proposed 6th generating unit at the Revelstoke dam. All components of this project are located within the Okanagan Nation's Territory, whereby all lands and resources are subject to our unextinguished Aboriginal Title and Rights.

This report will examine potential impacts to Okanagan Nation Title and Rights resultant from the proposed capacitor station including environmental, cultural and economic cumulative impacts.

Context

In the center of Syilx construct and relationship with the natural world, Syilx Traditional Ecological Knowledge Keepers (TEK) maintain *long term directives of how to move forward the paradigm of living within sustainable means and approaches of current and future needs*.

How do we achieve balance within the varying laws and the application of such influence of fundamentally prioritizing settler rights, systemic oppression, colonization, and economic considerations without fully reconciling the long standing Indigenous stewardship customs, practices and governance?

Syilx TEK provides two main sources or opportunities for knowledge utilization in relationships with the Natural World **A)** through the gathering and sharing of syilx principles, practices and Knowledge and through **B)** applications of customary practices that have persisted and proved their utility for many thousands of years.

Ancient place-based knowledge, principles and practice and their applications must be the primary consideration within governance and decision making frameworks with respect to responsible land and resource stewardship. The Penticton Indian band exists within a broader tribal and Salishan confederacy, and so decisions must take into consideration that broader context.

The Okanagan Nation Declaration states:

> *"We are the unconquered aboriginal peoples of this land our mother;*
>
> *The creator has given us our mother, to enjoy, to manage and to protect; we the first inhabitants, have lived with our mother from time immemorial; Our Okanagan Governments have allowed us to share equally in the resources of our mother;*
>
> *We have never given up our rights to our mother, our mother's resources, our governments, our religion;*
>
> *We will survive and continue to govern our mother and her resources for the good of all for all time."*

From the time before creation, creation time and human time there continues to be a spiritual, emotional, mental, physical relationship and responsibility to live in balance and harmony with the natural world as guided by the unique customs of the Syilx people. The Syilx have maintained the long-term connection to the territorial scope of occupation far beyond the boundaries of the Indian Reserve. Within the Community of the PIB, Syilx TEK experts have dedicated their lives to articulate the Syilx Indigenous perspectives in relation to environmental ethics, governance and to speak for our relatives (all living things) who cannot speak for themselves. These internationally sought after

perspectives are necessary to improve the standards and practices of modern day governments and law.

Scope

This report is focused on the proposed capacitor station located within the Penticton Indian Band Area of Responsibility, within an important cultural use area, adjacent to our places known as *kəɬpəlmapqən*, t̓əkʷt̓ikʷaʔt and sq̓ə pq̓apinaʔ/kɬxǎə sink approximately 14km west of ackɬt̓pus near what is now known as Summerland, BC. This report does not seek to describe the totality of snpink'tn and syilx interests within this important place, rather, an outline of our interests including past and current use; social constructs and the snpink'tn understanding of place and Sux^{w}txtem are described in an attempt to articulate potential impacts resultant from the project and propose mitigation measures.

This addendum to the broader Section C document produced by the Okanagan Nation Alliance, Okanagan Indian Band and Westbank First Nation will report on the traditional, historic and contemporary uses of the Westside of Okanagan Lake, within the vicinity of the proposed capacitor station. This report does not seek to present a totality of information pertaining to the area; rather an initial assessment of syilx interests are presented to ensure that the proponent is aware of our roles and responsibilities and potential impacts resulting from the proposed development. All information contained herein are without prejudice to, and shall not be construed as defining, waiving, or limiting syilx rights and interests. This information is provided in an effort to put into context the syilx relationship to lands, waters and all living things within the vicinity of the proposed development. This information should not be relied upon to inform any other process and should not be considered a complete account of interests within the area.

Modern institutions and forms of government lack the ability to recognize the long standing customary structures and practices such as traditional communal governance attained through sacred spiritual, ceremonial responsibilities and ancient agreements that have existed throughout the history of the Syilx people. Our way of living and being has been meticulously maintained through orality for many thousands of years. This document seeks to enlighten BC Hydro and the Environmental Assessment Office (EAO) as to our interests and obligations within the portion of Syilx Territory impacted by the proposed capacitor station and beyond.

The En'owkin Centre was instituted by the Okanagan Nation Chiefs and Elders in 1978 as the Okanagan Indian Resources and Education Society. This report has been informed by the En'owkin Centre, as a part of the Centre's mandate to protect, preserve and perpetuate Syilx (Okanagan) culture, language and education.

Penticton Indian Band Understanding of the Proposed Project

We understand that BCH is seeking to upgrade the current Revelstoke dam through the addition of a 6th generating unit which will add an additional approximate 500MW of capacity to the BCH grid. We understand that the benefits in terms of jobs and wealth will be gained in majority by BCH and the province of BC and that all impacts, both environmental and cultural, short and long term will be borne by the syilx Nation and its membership and our relatives (lands, waters and all living things). We understand that the same is true for the proposed capacitor station located west of what is now known as Summerland within the Penticton Indian Band Area of Interest, syilx Territory, whereby the province and BCH will acquire significant benefit through its construction (a requirement needed to support the additional generation capacity at the Revelstoke dam) and PIB, the syilx people and our relatives will bear all of the cumulative, short and long-term impacts resultant from this project.

We understand that the EAO utilizes a western scientific knowledge framework to render decisions regarding the proposed developments and that the current framework is premised upon allowing impacts to environment and culture to occur with the caveat that science-based mitigation measures will be put in place. We are fully aware of the fact that the EAO process does not, will not and cannot adequately recognize or properly consider Indigenous Knowledge within its western-styled framework. We know that in order to meaningfully engage PIB the entire framework and process must change – moving away from compartmentalized scientific ideologies focused upon quantifying impacts and towards an Indigenous holistic approach to responsible land and resource stewardship which recognizes and addresses qualitative impacts.

We understand that all of the proposed developments being considered by the EAO in relation to the Revelstoke 6 project(s) fall within syilx Nation Territory to which we hold exclusive Title and Rights as a recognized sovereign Nation and a responsibility for ensuring for the protection, restoration, enhancement and total regeneration of all lands, waters and living things.

Oral Historical Context

The Penticton Indian Band TEK Committee

TEK is an advisory group who are an Expert Body, providing ancient place-based knowledge through captikʷɬ and smiməy of many areas. The TEK committee was established to provide specific Syilx Indigenous knowledge in association with diverse knowledge texts including Syilx laws, ethics, customs and practices, protocols, historical, current and future accounts of harvesting, place names and oral literature through language speakers and Knowledge Keepers. TEK is a collective body who Chief and Councils can rely on, in any area, on or off reserve.

Operating through the current adoption of the Indian Band governance format (Community Elected Chief and Council) and the formalization through Band Council Resolution; the Penticton Indian Band TEK Committee has been established for approximately 15 years. Prior to that the Knowledge Keepers gathered in an informal process which maintained the lingering effects of discriminatory laws such as potlatch law.

The TEK Advisory Group recognizes and operates from the principle of being nsyilxcən that all Rights and Knowledge flows from Ḵʷuləncútn through sənkəlip's laws and that provincial and federal legislation are foreign tools which limit, restrict and diminish our responsibilities as nsyilxcən people. We therefore will provide advice to uphold and maintain those responsibilities, principles, laws and ethics, in the best way we can, thinking not only of today's generation but the generations to come and the needs of our relatives the timixʷ.

Syilx Governance

It is essential to recognize the pre-colonial governance and social structure that Syilx people maintained through cultural presence and practice. Colonization and militant efforts to oppress and assimilate the "Indian" and the genocidal eradication of Indigenous peoples and their territories over the past 200 years continues to impact the syilx people. Subsequently much of the current but inadequate efforts of reconciliation have fallen drastically short to legitimize prior indignities towards resource management, and superficial inclusion. Today, through the EAO process we see that superficial inclusion continues and it is our relatives who will suffer as a result.

From the sub-station perspective, the EAO process is focused on 'footprint' impacts associated with the capacitor station construction. Considering impacts within small 'footprints' does not align with the Syilx long term relationship with the area under discussion within this assessment. True engagement will be realized through learning and understanding the syilx worldview, learning and understanding syilx principle and practice, gathering information (knowledge) and resourcing and empowering Indigenous people to recover unhindered customary practices and uphold fundamental responsibilities to self, family, community, and the land.

The Syilx TEK are community experts with many disciplines of focus in long term practical applications as fluent nsyilxcen speakers. Our TEK are trained in areas of the chieftain quadrants, Skmxist, Syia?, Spiƛ̓lem, and Nytytix for *maintaining responsibility* of laws, protocols, ethics, standards, and practices. The knowledge held by the TEK include the land practitioners offering current knowledge of the land as utilized in cultural activities such as ceremonies, harvesting, management and distributions of resources. This very specialized training and required expertise is critical when seeking an Indigenous perspective. Specific culture knowledge is revered, because there is no place else in the world that could provide the knowledge base or expertise of local Syilx Indigenous people. There is a substantial difference in Aboriginal Traditional Knowledge (ATK) which provides broad knowledge generally known perspectives and applications and Traditional

Ecological Knowledge (TEK) which provides specific knowledge and applications of place and people.

TEK approaches bring forward ancient place-based Indigenous Knowledge in a customary process of communal governance. Language and cultural practice necessitate living as a part of the land to ensure appropriate decision making. Being a part of the land, waters and all living things is required for the planning of future activities for the Syilx people. This Indigenous approach has been in place formally and informally throughout existence of Syilx communal governance ensuring the balance of people and place is intact now and for the future.

The need to gather Syilx TEK with the intent of gathering historic, current and future requirements with the best possible information available through a complete and comprehensive TEK assessment is recommended. The expertise of the land knowledge is held within the families and those who have been trained to maintain traditional practices, while recognizing that not everyone one knew everything and that there are very specialized knowledge keepers of specific areas not limited to cultural practice, law, history, ceremony and use. Therefore, the question of who the experts are came and the response was that the people know who is responsible for the many areas of interest or question. In addition to the information absolutely needing to maintain the proprietary interest in the knowledge shared and be protected for ensuring that this information cannot be interpreted by anyone other than the TEK committee as a whole. It is with the intent to provide comprehensive, objective, and practical information for which the best decisions can be made.

Capacitor Station Impacts

Valued Ecosystem Components

A **valued ecosystem component** (VEC) is defined as a component of the environment that has scientific, economic, social or cultural significance. The EAO has included “expert” defined VECs into the environmental assessment process for the proposed Substation. Western Scientific Knowledge (WSK) utilizes a compartmentalized absolute approach to identifying impacts. Indigenous knowledge is not directly compatible with WSK despite efforts to make it so.

From the PIB TEK perspective one cannot segregate specific elements of the natural world and consider them to be more or less important. Our lands, waters and all living things are deeply interconnected and no one element is less or more important than the others – all things have equal importance and value. There are a number of key differences between the western scientific approach to identifying impacts and approaches utilized by syilx communities and the Nation. For example:

Indigenous Worldview	Western Worldview
syilx knowledge is based on ecological truths that have been passed down by the Creator and understood since time immemorial.	Western scientific knowledge seeks universal truths and utilizes the scientific method to quantify impacts using orthodox scientific investigations.
syilx epistemologies are narratively anchored in natural communities. timixw and tmxwulaxw are characterised by complex kinship systems focused on relationships between and among people, animals, the earth, and the Creator from which knowledge originates.	WSK is scientific and sceptical. Requiring proof as a basis of belief. WSK is suspicious of 'mysticism' and non-scientific ways of understanding; and often views non-WSK as less important, meaningful or accurate.
syilx knowledge is holistic and based upon the connectivity of all living things. It cannot be compartmentalised and cannot be separated from the people who are part of the system itself.	WSK is compartmentalised, quantitative, seeking to be absolute. WSK tends to address ecosystem components rather than ecosystem function. Such is the case with the use of VECs.
Syilx knowledge is focused on serving community needs and interests first.	WSK supports large scale authority systems. Authority given through roles and bureaucracy, regulation, laws and jurisdiction.
Syilx Indigenous knowledge is ecosystem knowledge and looks towards specific and broad landscape level effects.	Scientific knowledge is often focused on discrete elements of an ecosystem extrapolating information from indicator species or critical habitats within a specific timeline.
Relationships and a code of ethics, govern the appropriate use of the environment.	Laws and regulation govern landscape based on provincial and federal regulations and authorities.
It is rooted in the spiritual health, culture and language of the people. It is a way of life.	Science is rooted in the pursuit and application of knowledge and understanding following a systematic methodology based on evidence.

As described above, the western scientific paradigm is the basis upon which the EAO process is built. Indigenous Knowledge is isolated within “Section C”, compartmentalized as a separate Knowledge-base rather than the collection of principles, ethics, protocols and practices that make up its components parts. Indigenous Knowledge does not and cannot exist in isolation from the communities that hold it. The Indigenous worldview is not premised upon discrete units of Knowledge; it is premised upon a way of living with and understanding the world. Articulating Knowledge within a western form of communication is extremely problematic. The collection of Indigenous Knowledge and its incorporation into a compartmentalized written form within a western-scientific framework inhibits a full understanding of our interests. Further, consideration of our Knowledge by individuals who do not know, live or understand *Indigenous contexts, syilx teaching or learning processes* will continue to systematically ensure that Indigenous Knowledge is inappropriately considered within the EAO process while continuing to embrace the Western development paradigm to the exclusion of our natural laws.

Indigenous Knowledge that is utilized outside of the larger context on which it is based has the potential to lead to misunderstanding, misrepresentation and misinterpretation of the information.

In this light, it is important to understand that the impacts to syilx Title, Rights and culture are not scalable through WSK judgements. For example, if a particular animal species is killed, diminished or otherwise impacted the results of this impact extend beyond the potential harvest of this animal. Impacts to syilx culture cannot be quantified in this way. Taking care of the land is about more than taking care of ourselves it is about taking care of all living things, lands and waters. The capacitor station has the potential to impact, for example, cultural transmission practices, alter travel corridors, the movement of animals, hunting practices, wildlife relations and the use and stewardship of tmxʷulaxʷ, siwɬkʷ and timixʷ by the syilx membership and by our relatives as a whole. We believe in the interconnection of all living things and that impacts to wildlife can have far reaching effects. Through increased expansion and development these effects are compounded and exacerbated.

It is also important to understand that many people within the PIB community view the extraction of their knowledge for use within western-styled processes as inappropriate and, as such, are hesitant to share the depth and breadth of what they know with outside interests. This continues to be the case through this project. The EAO process is not trusted. The PIB community asks “There are clear and significant environmental and cultural unmitigable impacts that will result from the construction of Site C and yet Site C was approved, how is this possible?”. This example and many others have proven to the PIB community that either 1) their Indigenous Knowledge and understanding of impacts will not be considered or 2) that our Knowledge is not given the same weight as WSK.

Cultural and Environmental

The snpink'tn weight of responsibility associated with area/land use decision making is substantial and must carefully consider long term and cumulative impacts incorporating intergenerational planning and long term future needs and uses. Taking care of the land requires 100% regeneration, and/or restoration leading to true sustainability for all beings.

The observation of specific knowledge held by individuals in the differing quadrants of enowkinwixw; a) skimxist (elder man) b) Spiʔlem (Elder woman) c) Syia? (female) D) Nytytix (male) perspectives can provide more detailed information about specific enquiries about customary practices.

Knowledge holders are and traditional practitioners and families

There are many area users and we will narrow down into families

- Pierre Family (Casimir Pierre – Thomas and Late Joseph Pierre)
- Paul Family (Dominic and Patches)
- Armstrong Family (William and Lillian Armstrong)
- Kruger Family (Napoleon and Elizabeth Kruger)
- Other families include most all other families in community

This area west of what is now known as Summerland is known as a freezer or supermarket due to its abundance and variety of sources for spiritual, ceremonial, medicinal and food sources.

The historical and current knowledge of the area provides multi-dimensional aspects of;

- spiritual practices (vision quest, sweat lodge, other)
- customary activities (horse dance ceremony)
- captikʷɬ and smiláy stories, land markers, (ravens beak, scimasqilxʷ homes, other)
- training grounds, (puberty and skulst)
- major range lands (wild horse canyon got it name as a result of Syilx extensive range lands references from soap lake WA to Trepanier creek swim across Okanagan lake)
- major harvesting areas (roots, berries, fish, clams, 4 legged).
- This area is also known as a major travelling corridor for Syilx travel which with it comes a lot of current information.

The long term customary practices of the Syilx people have sustained a healthy balance between human consumption and interactions with the natural world through simple observations in respect

to the impacts created by activities of self, family and community practices in and on the lands where they live.

Cultural information has been derived from Syilx PIB TEK projects including TEK contributions such as:

- the PIB commonage claim research, (many participants including Dr. Jeanette Armstrong)
- the 7 Peaks research, (early 90's uranium moratorium)
- Summerland Hills research, (mid 2000's proposed golf course)
- Trout creek/shingle creek water governance report (Dr. Marlowe Sam)
- Summerland Ecological Management Plan (Don Gayton- inclusion Richard Armstrong TEK) TEK information and Traditional Burn
- June Creek initial assessment (2015)

In restoring respectful approaches in area/land use, the intent for undertaking Indigenous perspectives and research for areas in question, an inclusionary approach held in Indigenous process called the En'owinwix^{w}. Human activities continue to exert enormous demands and pressure for making decisions without comprehensive information data sets for decision making.

Syilx perspective of connectivity provides a much larger scope to the surrounding areas in such a way that all things are intertwined through a number of connecting factors that ebb and flow through before human time, coyote travelling, the creation orality, and the human time of significant benefactors to include all things in the future.

Although there may be constant influences contributing to the specific sites, it is not within the Syilx way of thinking or seeing to be focused on a linear process of consideration. With the adaptation of environmental and climate conditions the economic component is generally the last priority for consideration.

Syilx PIB TEK livelihood is derived through our interactions on the land provides sustenance in perpetuity. The sacredness of the relationship is such that *life is not taken but given,* in the sacrifice of responsibility and respect for the value of tmix^{w} (everything with a spirit, the natural world). The areas in question have been utilized for the immediate 300 years prior and beyond with recollections of stories before the first white man came into the area.

Placenames

The proposed capacitor station is located in the Penticton Indian Band Area of Responsibility, syilx Nation Territory, within an important cultural use area and adjacent to our places known as kəɬpəlmapqən, t̓əkʷt̓ikʷaʔt and sq̓əpq̓apinaʔ kɬx̌əsink approximately 14km west of ackɬt̓pus near

what is now known as Summerland, BC. kəɬpəlmapqən Translates to “Flat area behind the head” and refers to the smooth bald area behind the top of the mountain located immediately adjacent (southwest) of the proposed development. t̓əkʷt̓ikʷaʔt is the name of a mountain south east of Agur Lake and recorded archaeology site DjQw-16. t̓əkʷt̓ikʷaʔt translates to “little lakes” referring to three little lakes on top of that mountain. sq̓ə pq̓apinaʔ kɬx̌əsink translates to “sandy bald hillside” referencing the south face of this important mountain. Although this name refers to the south face of Bald Range, the entire mountain is called sq̓əpq̓apinaʔ kɬx̌ə sink. Bald Range Mountain can also be called by any of the two names, sq̓əpq̓apinaʔ or kɬx̌əsink. There are over 30 other nsyilxcen placenames that constitute what is now known as Summerland.

As with captikʷɬ, smiláy and the nsyilxcen language itself, snpink’tn placenames carry syilx knowledge that has been passed from generation to generation – they are the story maps that connected Indigenous people to place and which have guided syilx people from place to place. Within each name is information regarding how to take care of the land and animals and not all names are able to be shared outside of specific family’s or communities due to the sacredness of this Knowledge. Our people and place connection has remained strong despite the colonialist attempts towards assimilation and the impacts on culture and community. The places within the vicinity of the proposed sub-station and well beyond have been taken care of by the syilx people since time immemorial.

Use and Occupancy/ Hunting and Gathering

There are over 35 recorded Use and Occupancy points within the immediate vicinity of the proposed development and many hundreds within this actively used area. Taking care of all living things within these places is a responsibility that has been bestowed upon the syilx people by the Creator, Kʷuləncútn. The lands, waters and all living things have been effectively and responsibly taken care of using sənkəlip’s laws and protocols for ten’s of thousands of years. The development of a capacitor station within this area does not align with sənkəlip’s laws, and for good reason. The proposed capacitor station will have a negative impact on the ecology and connectivity of the region; in addition to direct impacts to the people of snpink’tn. Our recorded Use and Occupancy speaks to the stewardship of our four-leggeds in the area including deer, marmot and squirrel. The area is also an important berry gathering place for the people of snpink’tn as well as an area for the collection of ceremony and medical plants. Specific overnight habitation areas are located within these places both historic and present.

The proposed substation will have impacts on our use of the area by reducing areas where plants and animals can be harvested. The proposed development is also located on a relatively flat area that would likely have been used for camping or resting by our people and known syilx campsite is located close to six hundred meters away. Further, the proposed substation is not inline with syilx laws, principles or practice. The substation will continue to develop an area that was once intact,

altering animal movement patters and impacting the overall ecology of the region. Animal movements and use of the land take thousands of years to develop, each successive new development alters these patterns. It is our duty to protect and take care of these places; the substation is not an approved component of our stewardship strategy.

Fasting/Vision Quests

In this place all parts of the land, waters and all living things are taken care of as a whole. Already the ecology of the region has been fragmented and the people of snpink'tn have been working hard to maintain the integrity of these places through the incorporation of syilx laws. The snpink'tn people undertake fasting and/or vision questing for a variety of purposes. Some of these highly sacred cultural activities are associated with the transition from adolescence to adulthood and others are associated with the transmission of Cultural Knowledge. All fasting and vision questing is associated with being out in the natural environment, often alone with the Creator and all of creation. To spend time with oneself within an intact ecosystem is a fundamental component of syilx paradigm.

The proposed sub-station has the potential to impact syilx individuals who may choose to fast or vision quest within this area. When conducting ceremonies designed to connect oneself with the natural world in an effort to better understand syilx laws and oneself it is important for human developments to be limited. The areas near kəɬpəlmapqən, t̓əkʷt̓ikʷaʔt and sq̓əpq̓apinaʔ kɬx̌ə sink were historically completely intact. Over time colonial developments including forestry, roads and powerlines have impacted this area. This impacts may appear to be minor from the western perspective but they have impacted our ability to practice very important ceremony within this area. The proposed substation will continue this development trend further impacting our use of this area for ceremonial purposes.

Cultural Transmission

The syilx epistemology is based on the transmission of cultural knowledge from one generation to another. Cultural transmission occurs in a variety of ways many of which involve being out on the land within an Elder or Knowledge Keeper, speaking with the land and listening to the land. As more and more developments occur within the Penticton Indian Band Area of Responsibility the ability to properly transfer Knowledge from one generation to the next is impacted. The cumulative impacts resultant from continual development influence the very process of Cultural Knowledge transmission. The proposed substation, if constructed, will compromise how our youth are trained to hunt for deer or gather berries in the area. Large structures like substations change the dynamic of a place, the energy is altered and being out on the land is not the same – so the transfer of knowledge is impacted. The difference between teaching a youth about a syilx law in a classroom and teaching that same law on the land within an intact environment is substantial; the

developments in this place have had an impact on Syilx Knowledge transfer and the proposed substation will add to that impact.

Archaeology

WSK tends to focus on the presence or absence of archaeology as an indicator of “use” and/or cultural significance. This is true because archaeology can be quantified and more easily fit into WSK constructs. Our archaeology is extremely important and does provide critical information on land use and activities but its presence or absence does not define our relationship to the land.

An archaeological impact assessment was conducted at the proposed capacitor station site. The overview assessment indicated that substantial moderate to high archaeology potential was present within the region. No artifacts were discovered within the proposed capacitor station footprint during the AIA. This does not mean that archaeology is not present within the footprint area or that the area was not used for resting or travelling or the variety of other purposes that have been previously described. Archaeology, although an important tool, is generally subjective and samples an extremely small percentage of the overall land based.

The footprint impact of the proposed substation will forever impact the syilx people’s ability to utilize and take care of this portion of syilx Territory and alter the ecology of the landscape.

Critical Role of Cumulative Effects on Syilx Rights and Interests

The EAO has focused its assessment on impacts associated with the Revelstoke Dam and the Summerland capacitor station and transmission lines. However, it is impossible to isolate these elements from the broader context of development and impact to our lands. The capacitor station is but one human related development among many others that have impacted syilx Cultural Heritage. We are the caretakers of the land, waters and all living things. Colonial settlement has systematically and illegally inhibited and impacted our right to take care of our relatives and to undertake our cultural practices.

We are responsible for all the lands adjacent to the proposed substation and well beyond. Through the development of Summerland itself and numerous other land uses our relatives and rights have been impacted. Consent for these developments has not been provided by the Penticton Indian Band or the syilx people nor have these developments conformed to syilx laws. The proposed substation adds to this impact. Syilx laws speak to a fairness and equitability for all living things, all things deserve to be treated with respect and reciprocity. The proposed substation does not benefit our relatives in any way and further hinders their movements and use of the land.

Mitigation

The syilx people have always taken care of the lands, waters and all living things within our Territory. To ensure proper care the syilx people utilize a wide variety of mechanism, laws, protocols, principles and practices. One of the most significant concerns associated with the development of the Revelstoke 6 capacitor station is the fragmentation of the land and disruption of our timix^{w} including the way our people use and take care of the land. In addition, the capacitor station disrupts our roles and responsibilities in terms of taking care of our lands, waters and all living things. An important tool that has been utilized for thousands of years has been monitoring. Our people are out on the land consistently ensuring that our timix^{w} are healthy. Our people report their findings and recommendations back to the PIB community and appropriate changes are made to ensure for the health of our relatives.

In terms of mitigation we believe that a robust and lasting monitoring regime should be implemented to determine how the proposed substation (should it move forward) impacts our timix^{w}, which include the people of snpink'tn. This development of this monitoring regime cannot be undertaken in isolation and must be rooted in the Knowledge of our Elders and Knowledge Keepers. Objectives must include archaeological monitoring during any land disturbance and long-term monitoring of animal movements, impacts to the snpink'tn hunting and gathering community, propagation of invasive plant species, propagation of increased human use and development in the region and other long-term impacts that have the potential to result from the proposed capacitor station.

Part C – Secwepemc

Revelstoke Unit 6 Environmental Assessment Certificate Application

Prepared by: Adams Lake Indian Band, Neskonlith Indian Band, Splatsin, Simpcw First Nation, Shuswap Indian Band, and Little Shuswap Lake Indian Band

Simpcw First Nation
People of the Rivers

LITTLE SHUSWAP LAKE INDIAN BAND

CLCAHL - SPLATSIN - SEKEMAWS - SKWATIS - SPLMIWAYS -
WORKING TOGETHER TOWARD INDEPENDENCE

SHUSWAP BAND

Enclosed is the first draft of our submissions respecting the potential adverse impacts upon our Aboriginal title and rights, which may arise from the Revelstoke 6 upgrade project. This draft is provided to you on the understanding that these submissions will be treated as preliminary, and that we will have the opportunity to make further submissions in due course.

Unfortunately, given the limited time frames and budget, we have been unable to complete our community consultation process and analysis. As a result, we submit this draft in a state of significant concern for the validity of the EA process as a means to discharge the legal obligations of the Crown to the Secwepemc Nation regarding the impacts to our Aboriginal title and Rights from the installation of a sixth turbine at the Revelstoke Generating Station. We further insist that the BC EAO and BC Hydro recognize that their consultation and engagement requirements with the Secwepemc are ongoing and incomplete.

We also wish to clarify that as the 6 participating Secwepemc Bands, we cannot fully represent or address the interests of the Secwepemc Nation, who as a whole, are the proper title holders for Secwepemcúlecw. It is the Nation, alone, that can provide its free, prior and informed consent to discharge the Crown of its legal obligations.

In particular, we note the following:

1. BC Hydro's lead consultant provided socio-economic information on the proposed project a significant period of time after we were told that it would be received. This has left us with insufficient time to complete the critical review and response to the socio-economic information that was eventually provided. In addition, the information that was provided was deficient resulting in a large amount of discussions between BC Hydro's consultant and representatives of the Secwepemc.
2. Funding was not provided until very recently. Given that the Secwepemc could not incur significant costs in the absence of such funding, as BC Hydro was aware, there was a lengthy delay in the commencement of the work required.
3. The impacts of 1 and 2 have resulted in insufficient time to conduct a traditional socio-economic and cultural heritage impact assessment and a cumulative impacts assessment.
4. The lack of rigorous archaeological impact modeling and ground truthing is a concern to the Secwepemc people and needs to be conducted forthwith. In the absence of this, our submissions cannot be considered to be complete.
5. We have not been able to examine the historic impacts of the construction of the Revelstoke dam and its operation, which are important in assessing the additional impacts that will result from constructing a 6th generating unit at the Revelstoke Generating Station.

Once we have had more time to conduct a more thorough community consultation process, and been provided with more information on the project, we anticipate that there will be considerably more submissions being made by us. This is a matter of utmost importance to the Secwepemc peoples and thus we must take great care in ensuring that all concerns are heard and, if possible, addressed.

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12.0 ABORIGINAL CONSULTATION

12.1 Aboriginal Interests

12.1.1 Secwepemc Bands - General

A. PAST AND PLANNED CONSULTATION ACTIVITIES

BC HYDRO TO FILL IN

B. PROPOSED CHANGES TO THE ABORIGINAL CONSULTATION PLAN

BC HYDRO TO FILL IN

C. KEY ISSUES AND CONCERNS RAISED, THE PROPONENT'S RESPONSES TO THOSE ISSUES AND CONCERNS, AND THE STATUS OF RESOLUTION

SECWEPEMC PARTIES AND BC HYDRO TO FILL IN

1) comments on EIA provided but have not received a response
2) ongoing discussions with BCH regarding what is in scope with Rev 6 and what will be part of the broader agreement, broader issues and agreement

D. LOCATION MAP OF SECWEPEMC PARTIES COMMUNITIES IN RELATION TO THE PROJECT LOCATION

BC HYDRO TO FILL IN

E. TRADITIONAL ECOLOGICAL KNOWLEDGE AND TRADITIONAL LAND USE INFORMATION

SIMPCW FIRST NATION DISCLAIMER: Simpcw First Nation has agreed to provide limited cultural, socio-economic and historical information specifically relevant to this collaborative reporting effort between ourselves and the Secwepemc signatory communities to the Rev-6 EA Part C project. We include this disclaimer which informs the reader that we provide information acknowledging that certain data has been interpreted differently by various entities over the course of history. However, in order to maintain the integrity of that data, we provide here only what we can verify through the most reliable records available to us.

The participation of Simpcw First Nation in this project is without prejudice to the Aboriginal rights, including title, of Simpcw First Nation and to its position that it holds Aboriginal rights, including title, to the entire Simpcw Territory, within which parts of this proposed project is being undertaken.

Ethnobotany

Peoples' impacts on their environment and, in particular, changes in distribution of plant species, based on cultivation and collection of culturally-significant species, are increasingly being identified by researchers as wide-spread. However, it has only been in the past few decades that academics and other researchers have become aware of the sophisticated techniques Indigenous Peoples have employed to manage and maintain ecological resources (see Lewis and Ferguson 1988; Turner *et al.* 1990; Anderson 2005; Mann 2006). These methods include controlled burning, foraging strategies, selective harvesting, and cultivation techniques. Turner *et al.* (1990) describe the use of resource management strategies including controlled burning, by which, Secwepemc were able to modify a particular habitat to maximize production of certain fruits and edible roots. Controlled burning was formerly used to manipulate the habitat in areas such as blueberry and huckleberry berry picking areas, as well as hazelnut bushes. Burning on Crown land is no longer allowed and as a result, some of the prime berry picking areas have deteriorated (Turner *et al.* 1990:13). Adding to this, the valley floors and lower side hills in the region have also been heavily grazed and trampled by livestock. In some places, as a result of this grazing, some of the original character of the vegetation has been lost (Turner *et al.* 1990:17). However, despite these significant impacts and the ongoing effects of development on the Secwepemc Territory, the Secwepemc People continue to practice their traditional land use as well as actively manage and maintain ecological resources (see: Caretaker Responsibilities section for more information).

The ethnobotany of Secwepemc Territory is known about, in a large part, due to the efforts of Dr. Mary Thomas, a late Neskonlith Band member, whose lifelong initiatives to teach and pass on her vast knowledge of Secwepemc practices left a legacy of knowledge to her community and surrounding communities. In addition, Dr. Nancy Turner's extensive work in the region, at times in conjunction with, and learning from Dr. Thomas, has aided in understanding the ethnoecology of this area (see Hunn *et al.* 1998; Turner 1977, 1979, 1988a, 1988b, 1997, 2014; Turner *et al.* 2000a, 2000b, 1998, 1987; Peacock and Turner 1998). Further, interviews of Elders and other band members, knowledgeable about the plants and ecosystems within their territories, have provided researchers with extensive knowledge about the traditional lifeways and environment of this area, see section 12.1.1.f. of this report, see also Traditional Use Study (TUS) conducted for/by Adams Lake (Adams Lake *et al.* 2013a, 2013b; Adams Lake and Neskonlith 1999, 1998; DMCS 2014; Elias 2009), Little Shuswap Lake (Ernst 2000), Neskonlith (Adams Lake *et al.* 2013a, 2013b; Adams Lake and Neskonlith 1999, 1998; DMCS 2014; Elias 2009; Ignace and Ignace 2011;), Shuswap (DMCS 2014; Elias 2009; K/KTC 1998; Shuswap 2008), Simpcw (Simpcw FN 2009; Simpcw FN 1988) and Splatsin (Adams Lake *et al.* 2013a, 2013b, 2013c; DMCS 2012, 2014; DMCS and Splatsin 2011; Elias 2009; Splatsin 2008; Splatsin *et al.* 2012).

Plants and fungi of cultural significance include: alder, bluebunch wheatgrass, fescue, (Morrissey 2009:10) dog-tooth violet corms (Palmer 1975:29), alum-root, balsam fir, balsamroot, birch fungus, biscuit root, bitterroot, black cottonwood, black hawthorn, blackcaps, blueberry, bog cranberry, boxwood, bracken fern, buffalo berries, bulrush, cascara, cattail, chocolate lily, choke cherry, cottonwood mushroom, cow parsnip, Devil's club, Douglas fir, Engelmann spruce, glacier avalanche lily, hazelnuts, high bush cranberries, hemlock, hemp, horsehair (lichen), huckleberry, juniper, kinnikinnick, Labrador tea, lanceleaf spring beauty, lodgepole pine, lungwort, mariposa lily, morel mushrooms, native carrot, nodding onion, oak fern, Oregon grape, oyster mushroom, paper birch, pasture sage, pigweed, pine mushroom, plum, ponderosa pine, poison ivy, Prince's pine, puffball mushroom, raspberry, red cap berries, red willow, rose, sagebrush, Saskatoon berry, shaggy mane mushroom, shrubby penstemon, slough sedge, soapberry, sphagnum moss, spring beauty, stinging nettle, sub-alpine fir willow, tamarack, thimble berry, tiger lily, turnip, valerian, water hemlock, wapato, waxberry, western redcedar, white birch, white poplar, white spruce, whitebark pine, wild asparagus, wild goose berries, wild lupine, wild onion, wild rhubarb, wild rice, wild strawberry, wild tarragon, wild thistle, wolf lichen, yarrow, yellow avalanche lily, yew (Adams Lake, Little Shuswap Lake, Neskonlith, and Shuswap databases [CKKs]). See also section 12.1.e. for additional information on fauna and flora used by the Secwepemc.

The extensive knowledge of plants within the Territory is further indicated by the Secwepemctsin names for plants, which is evidence of long-term occupation, and vast utilization of the area. For example, Simpcw Archives currently has a record of 143 Secwepemctsin words for plants utilized in Simpcwul'ecw (Simpcw Territory), 16 Secwepemctsin words for 'unidentified plants' utilized in Simpcwul'ecw, and 76 Secwepemctsin words for 'other' plant terms utilized in Simpcwul'ecw, giving a total of 235 Secwepemctsin words relating to plants and ethnobotany (Eustache 1999). A majority of these plants and terms relate to the Study Area. When compared with the 97 plants listed above, Simcpw-Secwepemctsin plant names/terms, Simpcw has Secwepemctsin names for 74 of the 97 plants listed.

Ecology

People are, and always have been, active players in the history of the environment and landscape they inhabit. Just as cultural practices, e.g. hides for clothing, food choices based on seasonality, and construction of homes, such as the winter-dwelling *c ištkten* (s-eesk-ten) or pit house which can help to identify Secwepemc presence on the landscape[1], have been shaped by the environment of cold dry winters and which animals live in the area, so too, people have had significant impacts to the environments where they reside.

The large Secwepemc Territory encompasses ten[2] distinctive biogeoclimatic zones, described as the: Boreal Altai Fescue Alpine Zone, Bunchgrass Zone, Engelmann Spruce-Subalpine Fir Zone,

[1] "Pithouses are not known to have been used by the nomadic Ktunaxa and are absent from almost all of the Kootenay River, up which salmon were prevented from ascending by falls on its lowermost course." (Choquette 1997: 30). Therefore, any evidence of pithouses in the vicinity of the Study Area would be Secwepemc (supported by Borden 1956 in Choquette 1997:16.

[2] Secwepemc Territory contains nine biogeoclimatic zones in previous categorization systems, and the past names vary slightly.

Interior Cedar-Hemlock Zone, Interior Douglas Fir Zone, Interior Mountain-Heather Alpine Zone, Montane Spruce Zone, Ponderosa Pine Zone, Sub-Boreal Pine-Spruce Zone, and Sub-Boreal Spruce Zone (MFLNR 2016; see also Meidinger et al. 1991).

- Boreal Altai Fescue Alpine Zone (Alpine Tundra), has the harshest climate of any of the zones in BC, the average temperature of this zone is below zero for 7-11 months of a year (BC 2016).
- Bunchgrass Zone, bluebunch wheatgrass and sagebrush dominate this grassland zone.
- Engelmann Spruce-Subalpine Fir Zone, spruce (Engelmann and white) in the canopy with subalpine fir in the understory, dominate this zone. Intermediary stages of ecological succession within this zone includes lodgepole pine. In addition, within this zone, there are aspen, paper birch, black cottonwood, whitebark pine, limber pine, alpine larch, Douglas-fir, western redcedar, western hemlock, western white pine, mountain hemlock, and amabilis fir.
- Interior Cedar-Hemlock Zone, has more diversity amongst the trees than the other zones. western redcedar, western hemlock, and some interior spruce, Engelmann spruce, and white spruce, subalpine fir, black cottonwood, lodgepole pine, trembling aspen, paper birch, Douglas-fir, western larch, western white pine, and grand fir.
- Interior Douglas Fir Zone, in addition to Douglas fir, Engelmann spruce, white spruce, montane Spruce, sub-boreal spruce, lodgepole pine western redcedar, western larch, and grand fir, trembling aspen, paper birch, and black cottonwood, also occur.
- Interior Mountain-Heather Alpine Zone, mountain heather, and wildflowers dominate this zone, which makes up a relatively small percentage of the provinces zones.
- Montane Spruce Zone, is dominated by Engelmann spruce, and subalpine fir.
- Ponderosa Pine Zone, ponderosa pine is the primary species within this zone, with occasional white and Engelmann spruce.
- Sub-Boreal Pine-Spruce Zone, lodgepole pine dominates this zone, with white spruce occurring secondarily. Engelmann spruce, white spruce, black spruce, trembling aspen also occur in some areas.
- Sub-Boreal Spruce Zone, Engelmann and white spruce dominate this zone, with some lodgepole pine, subalpine fir, trembling aspen and Douglas fir, black cottonwood, and black spruce.

The climate varies considerably from the dry area near Kamloops to the wet Columbia Mountains (Ignace 1998:206), and has rolling plateaus, high mountain country, extensive grasslands, wet forests and the fish-rich habitat of the Fraser and Thompson Rivers (Palmer 1975:31), and the important fish habitat (Lindsay 1994:1) of the Columbia River.

This report focuses on groups that form the Eastern Secwepemc (Splatsín, Sexqeltqin (Adams Lake), Skw'lax (Little Shuswap), Neskonlith and the Kenpesq't (Shuswap Indian Band), and, on the northern Secwepemc group known as Simpcwemc, whose territory, Simpcwul'ecw, partially envelops, and is impacted by, much of the Rev6 and Kinbasket Reservoir developments. Another way in which to describe divisions within the Secwepemc, are the "Shuswap Lake Division" and the "North Thompson Division" (Ignace 1998:204), which are ethnographic divisions from within in the larger Secwepemc Territory presented by Teit (1909). See also Teit (1909:465), where he outlines these divisions and estimates the populations for 1909. example, Teit

(1909:523) describes a First Nations group, who live: "…nearly in the heart of the Rocky Mountains, around the head waters of North Thompson River, the Yellow Head Pass, and Jasper House" whom he named the Upper North Thompson band: east and north [their hunting grounds] . . . include... part of the Big Bend of the Columbia, part of the Rocky Mountain region. Some of these people apparently became part of a group known as the Kinbaskets (Shuswap Band), who according to Teit (1909: 460,467), were named for Kenpesq't, a North Thompson Chief. Other Bands also trace their genealogy and family connection to the Kinbaskets (Shuswap Band), and can trace ancestry to residents of the local study area for example, one or more Simpcw chiefs have genealogical connections to the Kinbasket chiefs of the 1800s[3].

The ecology of the landscape informs the archaeological record of this territory. For example, the migrations of large game throughout the plateaus are evidenced by the lithic tool technologies, with evidence of spear-hunting for the last 11,500 YBP giving way to bow hunting technology beginning around 2,400 YBP (Morressy 2009:37). While the tools people have used, to hunt in this area, continue to change, Secwepemc people still hunt large game including moose, deer and elk (see section 12.1.1.f. for contemporary hunting information).

Secwepemc (General)

Seasonal Round

Ron and Marianne Ignace have broadly characterized the Secwepemc seasonal round:

> *The Secwepemc seasonal round makes strategic use of the ripening and harvestability of roots and then berries at successively higher elevations between May and August, followed by the main season to fish for four species of salmon and dry large quantities (July – October) at different fishing locations, and by the main ungulate hunting season in early fall. Especially the summer to early fall months, thus, saw people travelling to places some distance away from their winter villages.*

The traditional seasonal round of Eastern Secwepemc peoples emphasized both river-based salmon fishing and the upland hunting of larger animals like deer, elk, moose, and caribou. Plants, particularly berries as well as some roots, were a major component of the diet. Traditionally, families moved between river and upland gathering locations seasonally (M. Ignace 1998:206; M. Ignace 2000:27-28; Ernst 2002:44-53; LeBourdais 2009). Teit noted that members of Shuswap Lake Division communities hunted on Salmon River, Columbia River near Revelstoke, around Mabel Lake and Sugar Lake, and through to the Upper Arrow Lake (Teit

[3] Kenpesq't's English name was Paul Ignatius Kinbasket and he was the son of Chief Yelhillna, who had begun the practice of seasonal migrations to the Columbia River from the winter village on Adams Lake (Dehart 1988:6 in Choquette 1997:15). This also indicates that 'historic' references to Adams Lake may be in Simpcw Territory. NTIB/Simpcw Chief Peter (Tseynitse7) Tenmesqet (Simpcw Archives in-house genealogy Record Number, RN-1) d. 1863, possible brother to Paul Kinbasket Father: Tseynitse7.
b) NTIB/Simpcw Chief Andre Tenmesqet (RN-2) b. 1832, d. 21 Oct 1919 Chu Chua, Father: Peter Tenmesqet (RN-1), Mother: Qwilcetkwe (RN-468).

1909:455). Teit noted, too, that "small parties of Stonies were wont to repair to Columbia River, where they fished with the Kinbasket" (Teit 1909:524).

The pattern of river fishing and upland hunting continues today – and the fact that people live year-round in homes on the reserves or in area towns like Vernon, Salmon Arm, Chase, or Sicamous has not changed the interest in these activities. Salmon fishing along rivers like the Shuswap and the Columbia (until 1938, when the completion of the Grand Coulee Dam blocked upstream passage) remains the focus of sustenance food gathering during the summer and early fall. Lake fishing for trout and whitefish takes place on many of the region's lakes; Mabel Lake, for example, is a significant inland trout fishing lake. Ignace asserts that the food procured by hunting animals like deer, elk and moose was almost as important a dietary source as fishing (M. Ignace 1998:207).

Today, too, seasonal salmon fishing and hunting, along with the collecting of berries, remain important cultural and sustenance activities. Plant gathering continues to provide Secwepemc people with food and medicines, just as it did for the previous generations of Secwepemc (Ernst 2002:35; Ayotte 2010). Berries like huckleberries and blueberries are a significant source of food even today. Medicines are collected from forested areas around the territory. And plant materials, like bark and roots, are used for the production of baskets. Community members talk of a continuing desire to use upland and riverine areas of the territory for the harvesting of foods that are central to a traditional, healthy and decolonized diet.

Adams Lake and Neskonlith also provide a detailed description of the seasonal round in their traditional use research (Adams Lake and Neskonlith 1999). In general terms, the work of these communities shows that the Secwepemc "maintained semi-permanent villages where food and technology were stored, and a network of specialized basecamps in the vicinity of particular resources which were extracted, processed and transported to the village. The basecamps were situated to take advantage of seasonal resource availability in each [region of Secwepemcúlecw]" (Adams Lake and Neskonlith 1999:10). The traditional use data from Neskonlith and Adams Lake also shows how significant contemporary and remembered harvesting is to local diets.

Table **1** shows the number of harvesting sites recorded by the research team for key species within a single research project (Adams Lake and Neskonlith 1999:32-35). The below number of harvesting sites are used to indicate the importance of these activities and are by no means an exhaustive enumeration of these sites. Additional sites have been recorded in other studies and are anticipated in the project-specific Cultural Heritage Assessment (CHA) to be conducted for the Revelstoke 6 Project.

Table 1: Adams Lake and Neskonlith Traditional Use Site Data (Selected Species)

Technique	Species	Number of Harvesting Sites
Hunting (large game)	Deer Moose	1403 382
Hunting (small game)	Grouse Pheasant	380 69
Trapping	Beaver	30

Technique	Species	Number of Harvesting Sites
Fishing	Trout	947
	Salmon	869
	Kickininee	262
	Ling	80
Plant collection	Berries	450
	Food	160
	Medicines	110

The Shuswap Indian Band describes the seasonal round in their traditional use study:

> *In the thousands of years preceding contact, survival for the Secwepemc people required a complex understanding of the natural world that surrounded them. The annual seasonal rounds of the Secwepemc were based on organizing their routines around the changing of the seasons and the availability and location of the staple food sources on which they depended (Shuswap Indian Band 2008:15).*

The Shuswap Indian Band continues its description of the seasonal round by quoting an Elder:

> *Our people traversed through this area. The Shuswap Nation - they had trails all over. We had trails there coming up from the Arrow Lakes, down towards Castlegar… we got trails coming through the Shuswap… we had trails all over and all along through the mountains and the Monashees, we had passes, people traveled right up into the Chu Chua area, or the Valemont area… the headwaters of the northern tip of the - at that point in time the Columbia River. Our people traveled back and forth through here (Shuswap Indian Band 2008:15).*

Drawing on Teit's work, the Shuswap Indian Band notes that the Secwepemc had five seasons (Shuswap Indian Band 2008:16-22; see
Table **2**). Drawing on Ignace's work (R. Ignace 2008:144-145), the Shuswap Indian Band's seasonal round highlights the experiences of many Secwepemc communities, particularly those who relied on the resources in the eastern parts of the territory.

Simpcwemc, for instance practiced seasonal rounds that integrated both riverine (anadromous fish, elk, deer), and high elevation harvesting (Mountain Caribou, Mountain goat and Big Horn sheep), and trade in prepared goods (hazelnuts) at given locations, at specific times of the year (Simpcw 1999:69) east and south of the Scrip Range, in the Columbia Valley. Of particular significance are the fall hunting and winter trapping rounds that would last weeks at a time, and would include the Local Study Area (LSA), as defined on page 17, on both sides of the Columbia, and into the Athabasca drainage (Simpcw 2011:58-59). This segment of the seasonal round required the collaborative and well planned efforts of skilled hunters and processors, and netted meat for winter use as well as hides, leather, bone and other essential material for clothing, tools and products for trade (Teit 1909:535-536). One Simpcw Elder recalls the trips "…from Yexyexéscen [now known as Mount Robson], Canoe/Kinbasket/McNaughton

Lake…hunting north side of Kinbasket Lake; elk, moose, deer in late fall" (Eustache 1999). Similarly, white sturgeon hunting was conducted, spring and summer, in the Study Area and required collaborative efforts to spear or line-hook and bring such large quarry to shore, process and smoke the meat, and transport it for consumption elsewhere (Simpcw 2011:52).

Table 2: Traditional Seasonal Round

Moon	Calendar Months	Key Species and Activities	Landscape Units[4]	Notes
First Moon – Pellc7ell7ullcwten "Entering month"	October-November	Elk hunting	River Terraces and Floodplains	Winter villages Story-telling
Second Moon – Pelltetéq'em "Cross-over month"	November-December	Deer hunting Trapping	River Terraces and Floodplains	Working skins
Third Moon – Pell7émtmin; Pellkw'ellemtmín "Stay at home month;" "stay underneath month"	December-January	Deer hunting Ice fishing for trout, whitefish	River Terraces and Floodplains	Working skins
Fourth Moon – Pelltsípwenten "Cache pit month"	January-February	Trapping and snaring Ice fishing Deer hunting	Montane Forests River Terraces and Floodplains	
Fifth Moon – Pellsqepts "Chinook wind month"	February-March	Deer hunting Digging for balsam root	River Terraces and Floodplains	Snow disappearing Low food stores
Sixth Moon – Pesll7éwten "Melting month"	March-April	Plant collection (early spring plants like chocolate lily) Sap collection Collection of spruce and cedar root, birch bark for	Intermediate Grasslands	Move from winter villages to family camps

[4] Landscape unit is an area of land classification based on common elements like animals or plants. It is one way in which Adams Lake and Neskonlith organize information about traditional Secwepemc cultural practices and a full description of the units is provided in their report (Adams Lake and Neskonlith 1999).

Moon	Calendar Months	Key Species and Activities	Landscape Units[4]	Notes
		baskets		
Seventh Moon – Pell7é7llqten "Root-digging month"	April-May	Trout fishing in lakes Deer hunting Plant collection (cow parsnip, fireweed) Indian potato harvested and stored	Alpine Intermediate Grasslands Intermediate Lakes	
Eighth Moon – Pelltspantsk "Mid-summer"	May-June	Berry collection	Montane Parkland Intermediate Lakes	Travel and trade
Ninth Moon – Pelltqwelqwéltemc "Getting-ripe month"	July	Salmon Trout Berry collection (eg. Blackcaps, gooseberries, squaw currant, soapberries, thimbleberries) Wild onion	Montane Parkland River Valleys	"The eastern people, on the Columbia [River] would have collected a good supply of blue camass for storage, as the men hunted along the familiar travel routes of elk and deer" (Shuswap Indian Band 2008:20).
Tenth Moon – Pesqelqlélten "Many salmon month"	August	Salmon Berries (Saskatoon, soapberries, blueberries, etc.)	Montane Parkland River Valleys	Along rivers
Eleventh Moon – Pelltemllikt "Spawned out month"	September	Hunting (elk, sheep, deer) Late season berries Mushrooms	Alpine Montane Parkland River Valleys	Back to mountains Monashees, Trinity Mountains (for example)

Moon	Calendar Months	Key Species and Activities	Landscape Units[4]	Notes
Balance of the Year – Pesllwélsten "Abandoning month"	October-November	Cranberries Soapberries Deer Marmots	Alpine Montane Parkland Montane Forests Intermediate Grasslands	Back to mountains

Note: The seasonal names provide both a reference to the sequence of the moons and a descriptive reference to the weather or other features of life at that time of the year. The table is from Shuswap Indian Band (2008) and Ignace (R. Ignace 2008:144-145). Additional elements are from Adams Lake and Neskonlith (1999).

Key Species

Many of the reports and documents prepared by Secwepemc peoples detail the importance and characteristics of key animal and plant species and this section draws on and replicates some components of those documents (e.g., Splatsin 2009; Adams Lake and Neskonlith 1999; Shuswap Indian Band 2008). Many reports acknowledge the importance of deer, elk, moose, fish of all kinds and berries to both the diet and the spirit. Here, information about a few species is provided.

Deer, Elk, Moose, Caribou

These upland animals were the primary game animals hunted for meat. Hunting deer, elk moose and caribou in the fall and early winter is preferred although the animals might be taken at other times of the year. It was inevitable that hunting accompanied fishing. One Splatsin Elder described her family going to Revelstoke when the salmon ran in the Columbia River. At those times, men typically hunted and the women prepared the smokehouses and tanned the hides. Moccasins, gloves and other kinds of clothing were made from the skins. Sometimes, children helped their mothers by scraping the hides. Caribou hunting is described in the oral history of all of Eastern Secwepemc communities. One Splatsin Elder describes having to wait 30 minutes for a herd of Caribou to pass in order to continue travelling through to the Arrow Lakes area. The mountain ranges west of Revelstoke were main caribou hunting areas as hunters could travel easily over land above the tree line (Williams n.d.).

As a further example, Rosemary Donald (Simpcw First Nation) remembers her grandmother, Annie Felix John, talking about the family traveling down the Columbia River to the lakes in the area and out to the Prairies to do trading and hunting. She was told there was a well-traveled trail north of Blue River to the Columbia Valley that her father, Chris Donald (1930s), her

grandfather Leo Dennis and Abel Saul used, via horseback. Chris Donald hunted in the Columbia Valley for moose, elk, deer and beaver. They would eat the beaver and trade the beaver fur for what they needed with First Nation people from the Prairies, as well as French trappers (Donald 2016).

Meat was dried on racks made from hazelnut wood. It could be dried in the air or with smoke. The smoke kept flies away from the meat. Women smoked meat with rotten wood, probably cottonwood, because wood with pitch or gasses would make the meat taste bitter. Green wood did not dry the meat very well. Typically, women and girls cut the deer meat in strips and looked after the fires. In addition, "According to Wells Gray Park employee, Charlie Shook, "During the fall caribou hunts these bands [Canim Lake and Chu Chua] often worked together as they hunted (Shook 1997)." and "Leo trapped and hunted as an Indian would. He followed the large herds of caribou and trapped and treed animals that may be following the caribou." (Shook 1997:61).

Simpcw hunted caribou with the "traditional use of large game hunts with chutes and wing traps….the use of bison products [by Simpcw] obtained through trade networks [from the Prairies via the Columbia River] not immediately available to other Secwepemc nations (Simpcw 2013)". Furthermore, "Historic descriptions of caribou fur lining the river banks at Clearwater from their crossings of the North Thompson River near Messiter", north of Avola, BC. The caribou traveled west from the Columbia River region. Their path was used as a trail to the east and the Plains in Alberta (Shook 1997, Simpcw 2015b).

Archival research of historic sites has identified a number of cabin sites, eighteen (18), in the vicinity of the LSA that may have been used for Aboriginal hunting activities in the past (approximately 1858, when there was a gold rush in the area). The historic cabins may be from the gold rush era but they could also be from historic aboriginal hunting activities in the region (Bussey 1978:22-25). Additional archival research should be conducted to clarify this potential evidence of Aboriginal hunting (see Smith-Burns 1977; and Bussey 1978, Appendix 1).

Berries

Berries (and other plant food) of all sorts are available throughout Secwepemc territory. Elders described collecting Saskatoons, huckleberries, blueberries, raspberries, black caps, choke cherries, Indian potatoes (skwnwinm), wild rice, strawberries, red currants and gooseberries (for a more complete list see Ernst 2002 and Ayotte 2010). Given the range of elevations available to berry collectors, ripe berries can be harvested at different times from late spring through early fall. Northeast of Mica Dam, people gathered berries and medicines and this, said one Elder, made the trip to the Mica area "worthwhile".

Berries are collected in ice cream pails or with birch bark baskets. Preserving berries by drying is a critical activity. One Elder described spreading berries on canvas boxes, set above the ground to allow for better drying. Children were required to turn the berries so that they dried on all

sides. Berries were also canned and frozen. Older Elders remember their parents describing traveling long distances to get berries during droughts.

Medicines

As a subset of collected plants, medicines represent a significant resource. In many cases, discussions of medicines – and where to get them – is kept private. However, Secwepemc people sometimes share this information in general form, particularly when medicine gathering areas might be impacted by development projects.

Medicines, and the process of collecting them, are closely related to matters of the spirit. Medicines, perhaps more so than any other collected food or material resource, reflect contemporary interests in cultural and spiritual identities as Indigenous people. The places where medicines are collected are shared in intimate teaching moments between parents and children. Community values are passed in these settings.

By way of example, one Splatsin Elder describes several different plant medicines collected in the upper Columbia River region and elsewhere in the territory. He mentioned:

- Indian tobacco noting that the Shuswap used to gather it … It was used to "chase your spirit out of your body so you wouldn't be scared, and could see what you had to see on the other plain." This tobacco was a mixture of kinnikinick, red willow bark and a small plant that grows on one of the creeks. That small plant, called y7ut in Secwepemctsín or Canby's Lovage in English, was collected in the Revelstoke area and traded with the Chinese who considered it a substitute for opium. The Shuswap got vegetables in return.
- Devil's Club is good for people with diabetes. It flushes the pancreas and kidneys and purifies the liver and blood.
- A Pasture sage bush is to cure sepsis poisoning.
- 'Frog Leaf' heals skin conditions.
- A plant referred to as 'silver leaf' was used for bronchitis and colds. It was a medicine used to boost the immune system and had silver leaves.
- Splatsin Elder describes the use of T'éqst'ye (Labrador Tea) saying "The dried leaves made a tea that could counteract Poison Ivy and also good for the heart and indigestion."

Fish

Fishing is, arguably, the most important food collecting activity of the Secwepemc people. In particular, the collection of salmon provided families with a significant amount of food throughout the year. By way of example, one Splatsin Elder said that her family needed two forty-five gallon barrels of salmon to have enough fish to last the winter. In her words, collecting that much fish was "a lot of work."

The North Thompson, Fraser, Shuswap and Columbia Rivers were important salmon fishing locations. The hoped-for return of salmon to the Upper Columbia continues to be of great importance to the Shuswap Band and Secwepemc Nation as a whole. Even smaller runs are important sources of subsistence, and additionally in maintaining identity as salmon fishing people (McIlwraith 2013:12-13). All the Secwepemc Bands rely on salmon to this day. Historical documents report this to be the case, even including bands whose traditional territory does not have a major run because of people's reliance on preserved fish (Alphonse 2002:12-13). Salmon runs are also important signifiers of territorial boundaries, even if other Bands had permission to access them (McIlwraith 2013:13, see also Ignace and Ignace 2004:384, Teit 1909 572-573).

A number of different techniques were used to catch salmon and other fish. Spears and harpoons, typically made by men in the spring, were common tools of the trade. In the rivers, weirs made out of hazelnut wood did not break as easily as weirs of other. Pitlamping was used traditionally as a way to catch fish. It was done by boat, often for sockeye. The light is put on the side of the boat on a calm night with not too much moonlight. Staying in shallow water, the fisher could then spear fish as they rose to the surface thinking the light was the moon. Another Elder remembered fishing with a pole as a child. She also remembered fishing at Hupel for salmon with spears.

Preparing oneself for fishing was important to fishing success and fishers cleansed themselves before salmon fishing. This cleansing included washing and/or burying clothes in order to get the human smell off of them. This had the additional effect of preventing grizzlies from being attracted to people while fishing. More than a practical matter, however, cleansing also prepares an individual to carry out activities that are central to one's Indigenous identity. Further, there is a very real sense here that as much as fishing is learned, it is also inherited. For this reason, the ability to fish in traditional locations, such as along the Columbia River is tied to family identity and status within the greater Splatsin community. Any further destruction of fishing areas with the development of the dam has the potential to impact family structures, the education of children and the social fabric of the entire community. One Splatsin Elder describes designated fisherman as skaotna (pronounced scout-na) "people of the river". Appointment of this position were based on skill and merit (Felix 2009).

Furthermore, these quotes illustrate the importance of fishing to Simpcw:

> *"There are 16 historic and prehistoric archaeological sites which have been recorded in the Kinbasket Lake/Canoe River region of the Robson Valley. Recorded prehistoric sites include: habitations with associated subsistence features such as cache pits, isolated cache pits, and surface and subsurface cultural materials including stone tools and stone waste flakes (Simpcw 2009). The Kinbasket migration did not prevent the Simpcw from continuing to live off the Study Area. Canoe River was once well known as an excellent salmon fishing spot. One Elder recounts "used to be clear and clean water*

and the salmon could come up and be eaten" (Simpcw 2009)." Fortier (2011:3).

"One Elder fished on the Upper Columbia about 40 years ago [circa 1971]. The fish that was caught was landlocked Salmon/Kokanee. In 1953 and 1963 the Elder fished in the Albreda River (both tributaries – South and North) and remembers the Kokanee being very plentiful in 1953. However, he noted there was a big decline of fish numbers since then. Another participant who had fished on the Upper Columbia River within the last ten years stated he fished for Kokanee and trout at least twice a year there. He notes that the fishing sites are worse now compared to 10 years ago.

The majority of participants did not think that allowing First Nation members to sell fish to non-First Nations was important or even an option to consider at all. Many expressed that fishing was not done for economic purposes, but to sustain their families. There was a variation of importance of fisheries options. Three participants thought that re-introducing salmon in the Upper Columbia River area was most important and one considered improving current fish stocks the most important option. Many of the participants suggested that all options (except selling fish to non-First Nations) were co-dependant therefore equally as important. Those who did not rate the options felt they did not know enough to make a decision or were concerned with the survival of the fish through the options listed.

The majority of survey participants thought that protecting threatened or endangered fish and their habitats was more important than improving current fish stocks for food and/or economic purposes. Many also noted that the two options go hand in hand, as all fish are important. One participant voiced that we cannot sacrifice one option for the other. There was one participant who thought improving current fish stocks for food and/or economic purposes was the more important option.

Participants felt that either more fish overrated bigger fish, or that improvement were to be made on both abundance and size. Not one participant valued bigger fish over the numbers of fish. However, concern with the decrease in the size of our fish, mentioning stories of how big and plentiful the fish used to be when they were growing up.

Three of the six participants did not think that Rainbow trout (10 lbs or bigger) was a good substitute for salmon in the short term. One participant mentioned that Rainbow trout did not have the taste or quality that salmon do, therefore would not be a viable option. Also, Rainbow trout did not store or preserve like a salmon and would have to be eaten right away. Two thought it was a partial substitute, and one thought it was a good short term substitute because the participant thought any option was a good option if our salmon were depleting." (Fortier (2011:4).

> *"Logging practices was a main concern with the people. The devastating effects of clear-cutting and bad management practices (such as current mining practices) are hurting the fish. Many were worried not only about the salmon and fish, but of the entire habitat. Other living things depend on the health of the ecosystem and it is our responsibility to ensure this. One voiced a concern with the pollutants in the water. Protection and enhancement of fish spawning grounds is a priority as well. A better awareness of traditional practices with the youth was also a concern. Another participant asked the question "what is the plan to address the issue of flooded reservoirs?". Rising mercury levels and changing oxygen levels are worrisome. Overfishing is also having devastating effects on the fish stocks." (Fortier 2011:4).*

> *"colossal disturbance created by logging in the area", current logging for pondage and other terraces and islands logged 10 to 30 years ago….pondage "will flood all islands and the majority of terraces as well as backing up many large creeks and rivers entering the Columbia along this eighty miles…." (Fortier 2011:5).*

> *"Logging practices was a main concern with the people. The devastating effects of clear-cutting and bad management practices (such as current mining practices) are hurting the fish." (Murton & Ferguson 1973:10).*

Many aspects of the traditional seasonal round of Eastern Secwepemc peoples continues to this day. The pattern of seasonal resource gathering, described above, including river fishing, upland hunting, and berry and plant gathering, as well as the cultural heritage significance of these activities, is maintained into the present, by community members. In the following discussion of Community-Specific Identified Uses of the Local Study Area (LSA), and Secwepemc Knowledge of the Mica Creek, Revelstoke, and Arrow Lakes Areas within the Upper Columbia River valley, previously documented Traditional Use data as well as historical connections to these places is presented.

Secwepemc Traditional Use and Knowledge of the Upper Columbia River Valley

Eastern Secwepemc peoples' history of use and knowledge of the Upper Columbia River valley is well documented (see Ignace and Ignace 2008; Kennedy and Bouchard 2005). The Upper Columbia River valley is an integral part of the Eastern Secwepemc seasonal round, a well-known travel corridor (Favrholdt 2009), and location of village sites (Shuswap Indian Band 2008). For example, **"**the frequent roving of the Indians who inhabit this upper parts of the North River [North Thompson River] to and from Jaspers House" (HBC 1852)…"These North River Natives hunted all the way up the North Thompson River and spent some of their time on the Columbia, where they were very close to the Rocky Mountains. There they would have also dug

for roots, such as the camas…some of the Jasper Natives came south, by the same route, to live in the Native village at North River [Chu Chua]" (Anderson 2015).

Within the Upper Columbia River valley, the Mica Creek, Revelstoke, and Arrow Lakes Areas, are especially significant and will be reviewed in detail in the next section, following the description of Community-Specific Identified Uses of the Local Study Area (LSA).

As documented through interviews with Elders and knowledgeable land users, and a review of ethnographic sources, Eastern Secwepemc peoples maintain a strong connection to the traditions and land-use practices of their ancestors. Spending time on the land, fishing, harvesting plants and animals, and participating in other cultural activities is crucial to culture and identity as Secwepemc people and caretakers of the land (Ignace and Ignace 2001). The following section presents the results from a number of different sources. The Community-Specific Identified Uses of the LSA details the results of a desktop review of previously documented Traditional Use data, organized by Traditional Use category. The following sections provide additional information on Secwepemc Knowledge of the Mica Creek, Revelstoke, and Arrow Lakes Areas, provided as part of a review led by Splatsin. Secwepemc place names within the LSA provided by Splatsin are presented in Appendix H.

Community-Specific Identified Uses of the Local Study Area (LSA)

This section identifies uses of the LSA by Adams Lake, Neskonlith, Little Shuswap Lake, Shuswap Band, and Splatsin. Following this is a detailed discussion provided by Simpcw regarding Simpcw's usage of the LSA and surrounding area.

A Traditional Use (TU) Value is defined as a specific place, resource, or interest reported by a Secwepemc member during a study, and is considered important to the ongoing practice of that community's land use. A site-specific TU Value is one that is reported as specific and spatially distinct and may be mapped (though locations may be considered confidential.) Site-specific TU Values, such as cabins, trails or hunting areas, reflect specific instances of use that anchor the wider practice of livelihood within a particular landscape. Table 3, below, details the nine (9) Traditional Use Value Categories, along with examples of the uses included in these categories, employed in this preliminary desktop review of results.

Table 3: Traditional Use Value Categories and Examples

Traditional Use Value Category	**Examples**
Cultural/Spiritual Sites and Place Name Values	includes cultural gathering places, burial sites, ceremonial areas, story places, teaching areas, medicinal and sacred plant gathering areas, Secwepemctsín place names, etc.
Future, Prospective, and Other Use Values	includes prospective hunting, fishing, habitation, commercial sites, etc.
Gathering and Processing Values	includes procurement of eggs, berries, food plants, drinking water sources, firewood, etc. and locations where specific tasks related to processing these resources took place
Habitation Values	includes cabins, camps, village sites, etc.
Hunting and Fishing Values	includes procurement of deer, moose, elk, other game, furbearers, fish, birds, etc. and locations where specific tasks related to processing these resources took place
Indigenous Landscape Values	includes boundary markers, orientation points, land based mnemonic values, etc.
Transportation Values	includes trails, water transport corridors, historical migration routes, etc.
Trapping/Commercial Values	includes trapping and commercial actives including trapping furbearers, pinecone picking, boxwood harvesting, commercial mushroom picking, etc.
Wildlife/Ecological Values	includes places of ecological importance such as fish spawning areas, nesting sites, mineral/salt licks, animal habitats, calving areas, etc.

It is important to note the limitations of the site-specific TU Value results presented below. As McIlwraith and Cormier (2015) point out, Indigenous relationships with the land are dynamic. In addition to considering the specific locations and activities Secwepemc land use what is also significant is "the broader context in which Indigenous peoples use, manage, and occupy their traditional lands" (2015:36). Moreover, the site-specific TU Values presented below should be understood as only limited representations of traditional use practices. Hunting, for instance, must be understood as integrated with Secwepemc "territorial use and control, the movements of people, and family relationships" (2015:39). The TU Values identified in the following section are more than sites on the land or isolated activities, but are connected to Secwepemc territorial integrity and cultural continuity (2015:50).

All six Secwepemc Bands have requested funding from BC Hydro to conduct Cultural Heritage Assessment (CHA) and/or Land Use and Occupancy Study (LUOS) research specific to the LSA. With this community-based research conducted in relation to the Revelstoke 6 Project, the narratives of community members would provide the context necessary to understand the currently available site-specific traditional use information.

The LSA, for the Revelstoke 6 Section C Desktop Review, was determined by combining three watersheds of the Upper Columbia River: Upper Arrow, Revelstoke Lake, Canoe Reach Columbia Reach[5]. This was chosen as it reflects a distance that the proposed BC Hydro Revelstoke Generating Station Unit 6 Project (the Project) is likely to have a direct impact on the Traditional Use of the Eastern Secwepemc. Using a combination of the three watersheds for the LSA encompasses potential effects on both the resources required for Secwepemc Traditional Use, and the area within which direct Project effects on TU Values may be experienced. For example, if community members can see, smell or hear an industrial development from the location of a TU Value this will often degrade or destroy the value of the site. Quiet is important for both spiritual sites and hunting sites. Industry-related noise may make a spiritual site unusable and noise from industry can deter wildlife from a hunting area making it useless. It also follows from these examples that a campsite that is utilized because of its proximity to a spiritual site or hunting site would also be rendered useless if the associated spiritual or hunting sites are rendered unusable. While these are only hypothetical scenarios they illustrate how Project effects have the potential to directly affect TU Values kilometres from a project footprint.

Preliminary Overview of Desktop Review Results

As has been identified in previous studies (e.g. Simpcw FN 2009:3, section 2.16), without a project-specific study that explicitly considers the Revelstoke 6 Project, results are incomplete when doing a desktop review. Due to the limitations of doing a desktop review, Secwepemc connections to the LSA are incompletely recorded. All six Secwepemc Bands have requested funding from BC Hydro to conduct CHA and/or LUOS research specific to the LSA.

As this CHA and/or LUOS has not been completed to-date, with interviews focused primarily on mapping TU Values within the LSA, the only results available for this Desktop Review are those from previous studies. These previous studies referred to, were available for review in the Adams Lake, Neskonlith, Little Shuswap Lake, Shuswap Band, and Splatsin Community Knowledge Keeper (CKK)[6] databases as of September 2nd, 2016. This includes TU Values mapped during other Traditional Use or Cultural Heritage studies, such as the Adams Lake Traditional Use Study (2013-2014), Adams Lake and Neskonlith Indian Band Traditional Use Study Project (1998), Chase Creek Road to Chase West and Jade Mountain Cultural Heritage Assessment (currently underway), Little Shuswap Lake Indian Band Traditional Use Study (2000), Shuswap Indian Band Traditional Use Study (2008), DMCS and McIlwraith (2014), and McIlwraith (2013).

It should be noted that none of these studies were targeted at the LSA, and most were focused on areas west of the LSA. The literature available on four of these five databases is listed in appendices A, B, C, and D. Splatsin's literature was examined for possible review from reports available through the band office, see Appendix E. The differences between the number of documents available within the databases reflects how recently individual bands acquired their

[5] This data was obtained from the British Columbia Government-maintained fish habitat data (British Columbia 2016).

[6] The Community KnowledgeKeeper (CKK) software package is mapping, data management, and integrated consultation tracking and response system used by 26 First Nation and Métis communities in Canada to manage the diverse records created through research and consultation processes.

databases, and human resources available to scan documents and upload them to this digital archive within each band.

There were approximately 12,831[7] site-specific previously mapped TU Values reviewed for this Desktop Review. In the Summary of Site-Specific Traditional Use Values section below, preliminary results from the Desktop Review of previous TU data intersecting the LSA are presented, by TU Value category.

Summary of Site-Specific Traditional Use Values

Site-specific TU Values recorded within the LSA are described in general terms below, according to the nine Traditional Use Value categories. Although the number of TU Values mapped in each category is presented below, these numbers under-represent mapped TU Values, because areas mapped as polygons tend to represent multiple uses by groups of community members over decades. Also, a single spiritual site may be considered in greater need of protection than multiple mapped sites from another category.

The numbers of TU Values in each category below are derived from a Desktop Review of the TU data from previous studies stored in the Adams Lake, Neskonlith, Little Shuswap Lake, Shuswap Band, and Splatsin's CKK databases are presented as qualitative data for descriptive purposes only. The limitations of this previous data must be noted. Some of legacy data are low in details and low in accuracy due to the limitation of certain paper mapping methods, which was the standard in earlier Traditional Use research. Furthermore, many of the TU Values listed below lack associated interviews audio, transcripts, or interview metadata and, as a result, it is challenging to determine accurate site descriptions, or details such as species, timeframe, and season. As a result of these limitations, a project-specific Secwepemc CHA and or LUOS for the LSA is required as it will provide the detailed baseline needed to accurately assess the impacts of the proposed Project on Secwepemc Cultural Heritage, as well as assist in developing potential mitigation measures. All six Secwepemc Bands have requested funding from BC Hydro to conduct a CHA and/or LUOS for the LSA. Furthermore, Simpcw First Nation specifically requests a LUOS be conducted, in order to establish a cultural heritage baseline to accurately assess Project effects.

Site-Specific Cultural/Spiritual Sites and Place Names

Site-specific Cultural/ Spiritual Sites and Place Names Values, including burial sites, ceremonial areas, and gathering places, as well as locations with Secwepemctsín place names, stored in the Adams Lake, Neskonlith, Little Shuswap Lake, Splatsin, and Shuswap Bands' CKKs intersecting the LSA were reviewed. Results of this review are as follows:

Through the review of previous Adams Lake TU data stored in their CKK, there were three (3) site-specific Cultural/Spiritual and Place Name Values reported within the LSA. Sites

[7] This is the combined number of TU Values stored in the Adams Lake, Neskonlith, and Little Shuswap Lake Band CKKs. The estimated number of Splatsin TU Values reviewed was determined by estimating the TU Values represented by site cards saved in the Splatsin Access Database.

intersecting the LSA include, community gathering areas (including seasonal hunting camps), and sacred areas.

Through the review of previous Neskonlith TU data stored in their CKK, there were five (5) site-specific Cultural/Spiritual and Place Name Values reported within the LSA. These sites include health sites, places community members have gone for healing and physical health, like hot springs, as well as medicinal plant gathering areas.

Through the review of previous Splatsin TU data stored in their CKK, there were fifteen (15) site-specific Cultural/Spiritual and Place Name Values reported within the LSA. These sites include burial sites, medicinal plant gathering areas, a spiritual training area, Traditional Story areas, spiritual training sites, health sites, named places, and pit houses (*c* *,'istkeh* uli in Chinook jargon).

Through the review of previous Shuswap Band TU data stored in their CKK, there were seven (7) site-specific Cultural/Spiritual and Place Name Values reported within the LSA. Sites intersecting the LSA include a burial site and medicinal plant gathering areas.

The review of previous data stored within the Adams Lake, Neskonlith, Little Shuswap Lake, Splatsin, and Shuswap Bands' CKKs has documented thirty (30) site-specific Cultural/Spiritual and Place Name Values reported within the LSA.

This data was recorded in studies that were not specific to the LSA, and it is anticipated that a substantial number of additional TU Values will be recorded in the requested Secwepemc CHA and/or LUOS research, specific to the LSA, which all six Secwepemc Bands have requested funding for from BC Hydro to conduct.

Site-Specific Future, Prospective, and Other Use

Site-specific Future, Prospective, and Other Use Values, including prospective hunting, fishing, habitation, commercial sites, and other uses such as recreation, stored in the Adams Lake, Neskonlith, Little Shuswap Lake, Splatsin, and Shuswap Bands' CKKs intersecting the LSA were reviewed. Results of this review are as follows:

Through the review of previous Splatsin TU data stored in their CKK, there were seven (7) site-specific Future, Prospective, and Other Use Values reported within the LSA. These sites recreation sites such as rock climbing, and log rolling sites.

The review of previous data stored within the Adams Lake, Neskonlith, Little Shuswap Lake, Splatsin, and Shuswap Bands' CKKs has documented seven (7) site-specific Future, Prospective, and Other Use Values reported within the LSA.

This data was recorded in studies that were not specific to the LSA. A substantial number of additional TU Values would be recorded in the Secwepemc CHA and/or LUOS for the LSA which all six Secwepemc Bands have requested that BC Hydro fund.

Site-Specific Gathering and Processing Values

Site-specific Gathering and Processing Values, including areas where foods, plants, or animal resources are gathered or processed, including food plant gathering, berry gathering, firewood harvesting, plant drying, berry drying, etc. stored in the Adams Lake, Neskonlith, Little Shuswap Lake, Splatsin, and Shuswap Bands' CKKs intersecting the LSA were reviewed. Results of this review are as follows:

Through the review of previous Adams Lake TU data stored in their CKK, there were eighteen (18) site-specific Gathering and Processing Values reported within the LSA. Site-specific Gathering and Processing Values intersecting the LSA include picking berries (e.g. huckleberries, blueberries, soapberries), and logging.

Through the review of previous Neskonlith TU data stored in their CKK, there were sixty-seven (67) site-specific Gathering and Processing Values reported within the LSA. Sites intersecting the LSA. Site-specific Gathering and Processing Values intersecting the LSA include picking berries, food plants, and specialty plants.

Through the review of previous Splatsin TU data stored in their CKK, there were thirty-eight (38) site-specific Gathering and Processing Values reported within the LSA. Site-specific Gathering and Processing Values intersecting the LSA include picking berries (e.g. huckleberries, blueberries, soapberries, rosehips, gooseberries), and mushroom gathering, food preservation areas, and birch bark and cedar root collecting areas.

Through the review of previous Shuswap Band TU data stored in their CKK, there were eight (8) site-specific Gathering and Processing Values reported within the LSA. Site-specific Gathering and Processing Values intersecting the LSA include picking berries (e.g. red huckleberries, black huckleberries), picking food plants (e.g. fiddleheads), and mushroom gathering (e.g. morels).

Through the review of previous Little Shuswap Lake TU data stored in their CKK, there were three (3) site-specific Gathering and Processing Values reported within the LSA. Site-specific Gathering and Processing Values intersecting the LSA include berry picking sites.

The review of previous data stored within the Adams Lake, Neskonlith, Little Shuswap Lake, Splatsin, and Shuswap Bands' CKKs has documented one hundred and thirty-four (134) site-specific Gathering and Processing Values reported within the LSA. This data was recorded in studies that were not specific to the LSA, and it is anticipated that a substantial number of additional TU Values would be recorded in the Secwepemc CHA and/or LUOS for the LSA which all six Secwepemc Bands have requested that BC Hydro fund.

Site-Specific Habitation Values

Site-specific Habitation Values, including locations of homes, cabins, camps, etc., stored in the Adams Lake, Neskonlith, Little Shuswap Lake, Splatsin, and Shuswap Bands' CKKs intersecting the LSA were reviewed. Results of this review are as follows:

Through the review of previous Adams Lake TU data stored in their CKK, there were two (2) site-specific Habitation Values reported within the LSA. Sites intersecting the LSA include cabins (which in this case were also used as teaching places).

Through the review of previous Neskonlith TU data stored in their CKK, there were five (5) site-specific Habitation Values reported within the LSA. Sites intersecting the LSA include cabins, homes, and campsites.

Through the review of previous Splatsin TU data stored in their CKK, there were twenty-nine (29) site-specific Habitation Values reported within the LSA. Sites intersecting the LSA include overnight campsites.

Through the review of previous Shuswap Band TU data stored in their CKK, there were two (2) site-specific Habitation Values reported within the LSA. These are camping areas.

The review of previous data stored within the Adams Lake, Neskonlith, Little Shuswap Lake, Splatsin, and Shuswap Bands' CKKs has documented thirty-eight (38) site-specific Habitation Values reported within the LSA. This data was recorded in studies that were not specific to the LSA, and it is anticipated that a substantial number of additional TU Values would be recorded in the Secwepemc CHA and/or LUOS for the LSA which all six Secwepemc Bands have requested that BC Hydro fund.

Site-Specific Hunting and Fishing

Site-specific Hunting and Fishing Values stored in the Adams Lake, Neskonlith, Little Shuswap Lake, Splatsin, and Shuswap Bands' CKKs intersecting the LSA were reviewed. Most of the hunting and fishing areas mapped as polygons represent decades of an individual or group subsistence activity carried out in a resource-rich area. Results of this review are as follows:

Through the review of previous Adams Lake TU data stored in their CKK, there were nine (9) site-specific Hunting and Fishing Values reported within the LSA. Site-specific Hunting and Fishing Values intersecting the LSA include trout fishing, moose and deer hunting.

Through the review of previous Neskonlith TU data stored in their CKK, there was one (1) site-specific Hunting and Fishing Value reported within the LSA. This is an elk hunting area.

Through the review of previous Splatsin TU data stored in their CKK, there were seventy-two (72) site-specific Hunting and Fishing Values reported within the LSA. Site-specific Hunting and Fishing Values intersecting the LSA include kickinee (kokanee), sturgeon, trout, Dolly Varden, carp, whitefish, and salmon fishing, goat, caribou, deer, bighorn sheep, and elk hunting, as well as fish drying and meat drying areas.

Through the review of previous Shuswap Band TU data stored in their CKK, there were two (2) site-specific Hunting and Fishing Values reported within the LSA. Site-specific Hunting and Fishing Values intersecting the LSA include Kokanee and ling cod fishing areas.

The review of previous data stored within the Adams Lake, Neskonlith, Little Shuswap Lake, Splatsin, and Shuswap Bands' CKKs has documented eighty-five (85) site-specific Hunting and Fishing Values reported within the LSA. This data was recorded in studies that were not specific to the LSA, and it is anticipated that a substantial number of additional TU Values would be recorded in the Secwepemc CHA and/or LUOS for the LSA which all six Secwepemc Bands have requested that BC Hydro fund.

Site-Specific Transportation Values

Site-specific Transportation Values, including locations of roads, water transportation routes, trails, old wagon roads, footpaths, etc., stored in the Adams Lake, Neskonlith, Little Shuswap Lake, Splatsin, and Shuswap Bands' CKKs intersecting the LSA were reviewed. Results of this review are as follows:

Through the review of previous Adams Lake TU data stored in their CKK, there were six (6) site-specific Transportation Values reported within the LSA. These sites include historic trails (i.e. horse trails), currently used trails and access routes.

Through the review of previous Splatsin TU data stored in their CKK, there were eight (8) site-specific Transportation Values reported within the LSA. These sites include historic trails (i.e. horse trails), currently used trails and travel routes

Through the review of previous Shuswap Band TU data stored in their CKK, there seven (7) site-specific Transportation Values reported within the LSA. These sites include historic trails and currently used trails, such as snowmobile routes, and access routes.

Through the review of previous Little Shuswap Lake TU data stored in their CKK, there was one (1) site-specific Transportation Values reported within the LSA. This site is an historic trail.

The review of previous data stored within the Adams Lake, Neskonlith, Little Shuswap Lake, Splatsin, and Shuswap Bands' CKKs has documented twenty-two (22) site-specific Transportation Values reported within the LSA. This data was recorded in studies that were not specific to the LSA, and it is anticipated that a substantial number of additional TU Values would be recorded in the Secwepemc CHA and/or LUOS for the LSA which all six Secwepemc Bands have requested that BC Hydro fund.

Site-Specific Trapping/Commercial

Site-specific Trapping and Commercial Values, including areas used to trap or conduct commercial activities such as commercial mushroom or boxwood picking, etc., stored in the Adams Lake, Neskonlith, Little Shuswap Lake, Splatsin, and Shuswap Bands' CKKs intersecting the LSA were reviewed. Results of this review are as follows:

Through the review of previous Adams Lake TU data stored in their CKK, there was one (1) site-specific Trapping and Commercial Values associated with trapping described in the LSA.

Through the review of previous Splatsin TU data stored in their CKK, there were ten (10) site-specific Trapping and Commercial Values associated with trapping marten and other commercial activities described in the LSA.

Through the review of previous Shuswap Band TU data stored in their CKK, there was one (1) site-specific Trapping and Commercial Values associated with trapping described in the LSA.

The review of previous data stored within the Adams Lake, Neskonlith, Little Shuswap Lake, Splatsin, and Shuswap Bands' CKKs has documented twelve (12) site-specific Trapping and Commercial Values reported within the LSA. This data was recorded in studies that were not specific to the LSA, and it is anticipated that a substantial number of additional TU Values would be recorded in the Secwepemc CHA and/or LUOS for the LSA which all six Secwepemc Bands have requested that BC Hydro fund.

Site-Specific Wildlife/Ecological Values

Site-specific Wildlife/Ecological Values, including locations of fish spawning areas, animal habitat, nesting sites, mineral licks, etc., stored in the Adams Lake, Neskonlith, Little Shuswap Lake, Splatsin, and Shuswap Bands' CKKs intersecting the LSA were reviewed. Results of this review are as follows:

Through the review of previous Shuswap Band TU data stored in their CKK, there was one (1) site-specific Wildlife/Ecological Values associated with past and present land use activities described in the LSA. This Site-Specific Wildlife/Ecological Values is a salt lick.

The review of previous data stored within the Adams Lake, Neskonlith, Little Shuswap Lake, Splatsin, and Shuswap Bands' CKKs has documented one (1) site-specific Wildlife/Ecological Value reported within the LSA. This data was recorded in studies that were not specific to the LSA, and it is anticipated that a substantial number of additional TU Values would be recorded in the Secwepemc CHA and/or LUOS for the LSA which all six Secwepemc Bands have requested that BC Hydro fund.

Summary of Site-Specific Traditional Use Values

The Desktop Review of previous data stored within the Adams Lake, Neskonlith, Little Shuswap Lake, Splatsin, and Shuswap Bands' CKKs has documented one hundred and forty-nine (149) Traditional Use Values from eight of the nine TU Value categories within the LSA. Each TU Value category is part of the interrelated practices of Secwepemc Traditional Land Use and Cultural Heritage. For Adams Lake, Neskonlith, Little Shuswap Lake, Splatsin, Shuswap, and Simpcw members to gather resources from the land (Gathering and Processing Values and Hunting and Fishing Values, knowledge of the land through names and stories (Cultural/Spiritual and Place Name Values) is required, as is the ability to be able to access the land (Transportation Values), and be able to spend the night on the land (Habitation Values).

While this Desktop Review demonstrates that the LSA has been, and continues to be, used by the Secwepemc peoples for practicing TU activities and necessary for the ongoing practice of

Secwepemc Rights, it also points to the need for a Project-specific CHA and/or LUOS. Only through a project-specific Secwepemc CHA and/or LUOS for the LSA, which all six Secwepemc Bands have requested that BC Hydro fund, involving research, interviews, and ground-truthing, focused primarily on Secwepemc TU within the LSA will it be possible for a Cultural Heritage baseline to be established and an assessment of anticipated impacts resulting from the proposed project to be provided.

Simpcw First Nation: overview of Simpcwemc use of the LSA and Surrounds

Note from Simpcw First Nation*: the following paragraphs are offered here not as definitive evidence per se but as a general discussion of Simpcwemc lands, waters and resource use and knowledge thereof, travel and relations with other groups, within and incorporating the Study Area; as such, while references to corroborating sources are made in the text, not all available sources are utilized herein.*

Prior to the construction of hydroelectric dams and the subsequent flooding of lands, under what is now called the Revelstoke Lake Reservoir, the south-bearing Columbia River trench provided not only an ancient thoroughfare for Simpcwemc travelling north and south, between places within Simpcwul'ecw and to the homelands of neighbouring peoples with whom they conducted commerce, but the corridor also hosted a diversity of ecologies and harvest species, upon which Simpcwemc have relied for millennia. Simpcw oral histories, genealogical records, early written records from fur trade era journals, colonial period ethnographies, combine to illustrate and confirm Simpcwemc use and occupation of the Study Area.

Prior to direct contact with Europeans (1790's), the south Columbia trench provided Simpcwemc with access to reliable Mountain caribou, Big Horn sheep and Mountain goat populations at higher elevations both in the Shuswap Highlands/Adams Plateau, and into the Selkirk Range above Mica Creek and Big Bend. Other species harvested in the corridors and plateaus associated with the Study Area include bear and marmot, and elk and deer[8] migrated throughout the east and southern lower elevations, in addition to grouse and ptarmigan; waterfowl and salmon, trout, whitefish and sturgeon inhabited the Columbia waters and tributaries[9].
Plant harvest was a ubiquitous function of moving across the land seasonally for Simpcwemc, and all travel routes considered the predictability, abundance and distribution of nutrients, tool source and medicinal plants, at all harvest elevations.

Simpcwemc, are considered to be a highly mobile Secwepemc Band, and are characterized by the use of both riverine and higher elevation lacustrine (lakes) habitation types[10], with

[8] Retrieved from: DodiePLACENAMES-Draft.docx; paraphrased from interview transcripts, from "Yexyexéscen [now known as Mount Robson], Canoe/Kinbasket/McNaughton Lake…hunting north side of Kinbasket Lake; elk, moose, deer in late fall".

[9] Moose were not a prevalent harvesting species in Simpcwul'ecw until after the turn of the 20th century, but were hunted readily as their numbers increased, in the wake of logging and large burns experienced in the late 1800's, early 1900's.

[10] Alexander, Diane. *A Cultural Heritage Overview of the Cariboo Forest Region.* Prepared for Cariboo Forest Region, Ministry of Forests, Williams Lake, BC. 1997.

occupation locations often reflecting patterns in harvest species fluctuation, trade and commerce opportunity, and the strict adherence to systematic land and resources stewardship and intergroup sharing protocols[11]. Trapping areas, for instance, were carefully monitored and maintained through hereditary descent, and rarely if ever trapped out of ecological balance[12].

Habitation types associated with trapping tended to be temporary, although strategic camps may have been revisited annually, as were caribou hunting base -camps and lower-elevation processing sites. These encampments would have been constructed to house family or clan groups working collaboratively together to conduct highly organized hunts, and would have consisted of conical or rectangular bark and pole lodges, above ground, with smoking pits and drying racks, as well as cache and cooking pits. There may also have been surficially evident sites that illustrated the collaborative and labour-intensive harvest of large and small sturgeon (even a sub-adult sturgeon can require more than one adult human to reel it to land).

While large-run salmon fisheries were seasonally important to Simpcwemc, and required residency at main-river fishing grounds for the spring and fall harvest seasons, the use of *c* (*kekuli* semi-subterranean circular winter homes) appears to have been regionally preferential, and dependent on elevation of wintering villages[13], whereas cache pits and above-ground caches were consistently constructed where ever harvest areas provided such volume. The primary Simpcwemc cultural activities on the lands and waterways now submerged beneath the Study Area, therefore, along with the Area's geological characteristics[14] may well have left some diversity of site type within the archaeological record, with respect to the habitation near to, and the function of certain places. Archaeological work in the Study Area has been sporadic and hampered by research design, untenable time frames, funding limitations and construction disturbance[15]; much of what could have been systematically investigated under less problematic

[11] In 1903, James A. Teit, early ethnographer, recorded Simpcwemc oral histories provided by Elders regarding the general Simpcwemc seasonal rounds, with its regional similarities and differences from other Secwepemc, and specifically regarding territory, land use and stewardship of resources. While Teit was unable to attend many of the population hubs within Simpcwul'ecw, he was aware that Simpcwemc continued to use the Canoe-Columbia corridor as a primary thoroughfare at the time of his field research. His recording work was not published until 1909; *see* Teit, James A. *The Shuswap*. Memoir of the American Museum of Natural History, Jesup North Pacific Expedition. 2 (7):443-758. 1909a. Reprinted by AMS Press, New York

[12] This state of balance, however was dramatically altered with the advent of post-contact Canadian fur trade activity in the Columbia/Canoe corridors, primarily by independent freemen fur hunters and steel-trappers, between 1800 and 1840's. It was the policy of these imported harvesters to extirpate whole colonies of fur-bearing species in pursuit of control of the trade between local peoples and trading posts. In addition, meat-hunters were similarly employed to supply posts and expeditions to the extent that entire watersheds could be denuded of ungulates within a hunting season. Following the slow recovery of some species, these populations and the habitats they relied upon were once again largely extirpated with the flooding by hydroelectric dam systems, both in the Canoe corridor and in the Study Area.

[13] *Ibid:* Alexander, Diane. *A Cultural Heritage Overview of the Cariboo Forest Region.* Prepared for Cariboo Forest Region, Ministry of Forests, Williams Lake, BC. 1997.

[14] The geology of the Study Area is characterised in some places by steep inclined canyon walls and backswept, forested slopes, which, prior to inundation, supported lower terraces and jetties that provided access to harvestable species in the Mica and Columbia confluence area.

[15] See Choquette, Wayne. *Archaeological Overview Assessment: Monitoring Program No. CLBMON-51; Kinbasket and Revelstoke Reservoirs.* Prepared for BC Hydro, 2008.

circumstances, is now subject to underwater archaeological methods and the attendant logistical and financial challenges.

Simpcwemc also travelled extensively outside of the boundaries of Simpcwul'ecw on annual trade and collaborative harvest missions, both with other Secwepemc, and with groups to the south (K'tunaxa, Sinixt), and on the eastern slopes and foothills (Nakoda). Certainly Simpcw's long-standing trade relations with other ethnic Secwepemc, and especially with outside cultural-linguistic groups, required them to be resourceful, reliable and self-sufficient, linguistically capable and highly mobile. While Simpcwemc probably maintained more consistent respect from other groups through their willingness to negotiate, or to create mutually beneficial alliances through political pact or marriage-based agreement, Simpcw oral history is clear in its recounting of occasions where Simpcwul'ecw was defended in the face of interloping (Sekani, ca. 1790's), thieving (mix-blood freemen, ca. 1860's), or invading (Tsilhqot'in, ca. 1873) forces; often in collaboration with other Secwepemc groups, Simpcwemc so managed to maintain the boundaries of the territory. All accounts suggest that, as opposed to "warring" synonymous with other groups, Simpcwemc preferred to swiftly and expediently dispatch the offending parties and restore peace.

In summary, the Study Area has long been utilized by Simpcwemc, positioned as it is in the southern-most quarter of Simpcwul'ecw, and its importance as a travel corridor and harvest resource area is borne out in the many sources of written and remembered information. Simpcw First Nation is currently undertaking to amass and systematically organize this volume of data, including detailed lists of harvested species, distribution, seasonal rounds, and further archival, genealogical and oral historical records.

Secwepemc Knowledge of the Mica Creek Area

The Mica Dam was built in 1973. It was slated for expansion in the early 2000s and in 2009 some traditional use research was conducted into Secwepemc uses of that area (Splatsin 2009; Elias 2009). Elias worked with Elders from Adams Lake and Neskonlith on their project and Elias largely determined that memories of the Mica area were fading (Elias 2009:12; 23). That work did record a number of extensive statements of use and memory related to the Columbia River between Revelstoke and Mica, leading Elias to conclude:

> *[There] is enough of a record to indicate a continuous tradition of use of the Project Area for at least the past several centuries and, perhaps, for the past several millennia. Just as important, as [an Adams Lake Elder] points out, the knowledge of the periphery is far from extinct and neither are the skills needed to make use of lands and resources in the Project Area (Elias 2009:23-24).*

Similar work was conducted in Splatsin (Splatsin 2009). From that work, Elders also remembered a history in the Mica Dam area. They spoke, for example about hunting and fishing in the area that is now flooded. One Elder said they used to go to the Canoe River at Mica but now it is blocked off. Trout, kokanee and Dolly Varden fishing in the Columbia River south of the Mica Dam.

The Mica area is significant to the Splatsin people for a variety of reasons. Specifically, the region contains habitation sites, food harvesting sites on land and water, plant and berry collecting, burial sites, ceremonial sites, trails and pre-flood activity areas (Splatsin 2009:16).

Secwepemc Knowledge of the Revelstoke Area

The Sexqéltkemc Bands (Adams Lake, Neskonlith, Splatsin) in collaboration with the Shuswap Indian Band, have conducted several traditional use studies in the area around Revelstoke (Splatsin 2008; 2009; DMCS 2011; 2012; 2014). Those studies have concluded a significant Secwepemc presence in the Columbia River valley and the Upper Arrow Lakes.

In addition, Neskonlith and Adams Lake conducted a TUS and produced a report (1999) which focused on the intersections of culture and landscape within the Territory (including the Revelstoke and Arrow Lakes regions). This report also includes information about the history of the Secwepemc during the days of European contact, in addition to past and contemporary traditional land-uses.

Little Shuswap Lake has also conducted their own TUS which includes the Revelstoke area of this Section C's LSA (Ernst and Artz 2000). This study examined traditional land-use and included ground-truthing and TUS camping expeditions to better trigger people's memories of areas and uses (Ernst and Artz 2000:18).

Shuswap Band conducted a TUS, and archival review (Fish Creek Consulting 2007) which includes TU sites within the Section C LSA. This study documented sites by a Traditional Use Committee and focused on "…kekulis, burial sites, pictographs, spiritual sites, cultural sites, traplines and trails, and resource use sites (primarily fish and medicines)." (Fish Creek Consulting 2007:21). In 2008 another TUS study was conducted by Shuswap.

The Revelstoke area is used routinely for camping, plant collection, fishing, and hunting. It was a significant place within the Splatsin seasonal round of movements for food. And, it was a place at which Secwepemc peoples met other Indigenous peoples. The following section is taken from DMCS (2014).

In addition, historical, community-based research conducted by Splatsin researchers in the late 1990s documented Splatsin boundaries as much further east than Revelstoke. This eastern boundary is associated with Splatsin genealogical and historical connections to the Shuswap Band. Trails linking Splatsin people to the Shuswap Band's core territory on the eastern side of the Selkirk Mountains likely passed through the Monashees to the Nakusp-Needles area and through the Selkirks at Rogers Pass (Splatsin Needles Research 1999; 2000). This type of research highlights the need for more specific research. All six Secwepemc Bands have requested funding from BC Hydro for a Secwepemc CHA and/or LUOS of the LSA. The interviews mentioned here, regarding Splatsin genealogy and territory, would be reviewed during a CHA and/or LUOS with the current research questions in mind.

Simpcw First Nation has been conducting scholarly research of its ethno-cultural, historical environmental, and archaeological information, and inherited knowledge, since the late 1970's, beginning with cultural overviews and sub-regional studies, audio and video interview and transcription, collection of story and place knowledge, GIS mapping throughout the era of the BC Forestry TUS program, and into the contemporary research theatre with Land Use and Occupation Studies, and Land Use, Resources and Ecological Knowledge templates, and has, as a result, gathered and synthesised a great deal of verifiable documentation. Simpcw has developed an extensive library of pre-1846 post-contact period archival material, mapping, oral history, relevant literature and ethnographic information that provides its cutting-edge GIS department with specific emphasis on the Study Area, and the many interdependent places and phenomena that surround it. Simpcw also makes a concerted effort to stay current with the outcomes of, and impacts resulting from land-mark court cases that shape indigenous research. All primary and secondary source information is critically analysed and considered in its various contexts

The Shuswap Band has also conducted TUS interviews which included information relating to the Revelstoke area. Horse trails used during the Shuswap Band's seasonal round included mountain routes, which passed through Revelstoke (Shuswap Indian Band 2008:26). For the Shuswap, the flooding of the area, for the construction of the Revelstoke Dam, caused negative impacts e.g. the change from river habitat to reservoir habitat reduced the potential spawning populations for numerous species, particularly whitefish and trout (Shuswap Indian Band 2008:79). Thus, negative effects of the dam included the reduction of land the Shuswap used for hunting, fishing, and trapping. These important cultural places were further impacted as archaeological sites (e.g. burials and village sites) were also affected (Shuswap Indian Band 2008:79).

Anthropologists and historians have worked in the Columbia system, and regionally around Revelstoke, for years. Work by Bouchard and Kennedy is noteworthy because it speaks directly to aboriginal uses of the Columbia River Valley near Revelstoke (see Bouchard and Kennedy 1986; 2005; Kennedy and Bouchard 1998; Arcas Associates 1986). Bouchard and Kennedy's work emphasizes the aboriginal presence in the area, recounts the observations of railway surveyors who interacted with Indigenous people near Revelstoke at Big Eddy, and concludes that the Columbia River Valley was a tremendously busy place for food collection, habitation, and political interactions including fighting (Bouchard and Kennedy 2005:70).

Bouchard, Kennedy, and Stephen Lawhead, all working for Arcas in the mid-1980s, comment on Indigenous uses of the Illecillewaet Valley, within the Section C LSA, in relation to the proposed widening of Highway 1 between Sicamous and Revelstoke. Working with Splatsin Elders, among others, Bouchard, Kennedy, and Lawhead compiled place name and use information for that stretch of highway. The Illecillewaet River Valley was included in their results. Citing Boas and Moberly, Bouchard and Kennedy assert that there is "no conclusive evidence for Indian utilization of the area around the mouth of the Illecillewaet, or for the Illecillewaet River itself" (Bouchard and Kennedy 1986:82). They complain that "present-day [i.e. 1986] Native people

appear to have only a fragmentary knowledge of the traditional utilization of [the Illecillewaet] area" (Bouchard and Kennedy 1986:83). The Bouchard and Kennedy research results lack information that researchers working with the Secwepemc expect is available from living Elders (McIlwraith pers. comm. June 30, 2016). All six Secwepemc Bands have requested funding from BC Hydro to conduct CHA and/or LUOS research specific to the LSA. Project-specific interviews, conducted as a part of the requested CHA and/or LUOS, will provide the opportunity to elicit this TU information from living Elders.

Despite the limited results of Bouchard and Kennedy's research, Stephen Lawhead's research with a Splatsin Elder is noteworthy. The Splatsin Elder provided Lawhead with a place name for Revelstoke. It is sts'ek'kin, meaning 'connected' and referring to Revelstoke as a place at which Secwepemc and Sinixt people came together (Bouchard and Kennedy 1986:90; Lawhead 1986:95). In addition to that, another Splatsin elder provided a name for the surrounding environs - Stilthn meaning, "Mountain peaks" (Cormier 2015).

Furthermore, in their 2005 study of the Columbia River, Bouchard and Kennedy elaborate on their earlier consideration of the evidence for Aboriginal uses of the Illecillewaet Valley. They note the recording of an Okanagan-Colville name for the Illecillewaet River (Bouchard and Kennedy 2005:73). And, they assume the presence of a trail along the Illecillewaet River based on information from a historian and Walter Moberly: "Only a limited amount of information has been recorded about the Native use of the Illecillewaet area. According to local historian Kate Johnson, "pony trails of the Indians" led from Revelstoke "on to the Rogers Pass country" (presumably alongside the Illecillewaet; Bouchard and Kennedy 2005:73). Bouchard and Kennedy continue, addressing specifically Lakes (Sinixt) use of the Illecillewaet Valley:

> *We have found no additional evidence that the Lakes people regularly went up the Illecillewaet River -- this is not to say they did not utilize this area, it is just that we are aware of no records of their having done so, above and beyond the Johnson [local historian] and [Walter] Moberly references. Nor are we aware of a Lakes settlement around the mouth of the Illecillewaet where Revelstoke is now located. As discussed above, the available documentation suggests that their settlement was on the opposite side of the Columbia River from Revelstoke, near the mouth of Tonkawatla Creek (Bouchard and Kennedy 2005:73).*

Oral history from Adams Lake supports the idea that Secwepemc peoples were active in the Illecillewaet Valley during the time of the surveys by non-Native surveyors. An Elder from Adams Lake describes the events of that era and, in doing so, affirms Secwepemc travel through the Valley to Rogers Pass:

> *There was a story that I understand from the Kinbaskets [family]. When they survey crew came out … Rodgers and whoever else was with Alex Kinbasket was trying to find the pass to go over, or the easiest way to get to the Golden area was the idea. So they were going up there, and these people [the surveyors] were coming down. They asked them of course. "This is a restricted area. We are going to be surveying all of*

> *this. What are you doing here?" We were swimming [quiet laughter]. Simple as that. But anyways, regardless shouldn't, push this aside in regards of where our line was. Where did we go, where did we live? Illecillewaet is a big water way. You can go all the ways up. A long way on that river. But the government took off from wherever, and went up over the top to where Rodgers Pass (48:08) and down (July 21, 2009).*

Shuswap Band elders who recently recounted their ancestors guiding the surveyors through the Rogers Pass (Cormier 2015) corroborate this oral history as well.

Secwepemc Knowledge of the Arrow Lakes Area

> *Now I'm going down to Needles up there. I'm going for that trip up there. I'm going to make a speech up there. Why we're up there. Why I know that place. I'm going to tell. And land claim why I want that land. Land claim.*
> Splatsin Elder (TUS 1)

There are a number of different geographical and physical connections between the Eastern Secwepemc and the Columbia River valley, as traditional use research led by Splatsin has demonstrated. These geographical connections include trails which, beyond waterways, conveyed people between the Shuswap and Eagle River valleys in the Fraser River watershed into the Columbia River watershed (see above). Splatsin community members have spoken at length in traditional use study interviews about current and past uses of the Arrow Lakes and Columbia River valley. Hunting is a primary reason for going to the Arrow Lakes, but the collection of berries and medicines, and fishing are also given as reasons to go there.[16]

Trails linked the Secwepemc territories of the Fraser River watershed and these traditional use locations in the Columbia River valley. There are trails that bring people to the Columbia River north of Revelstoke, a trail up the Eagle River goes to Revelstoke, and trails through the Monashee Mountains are identified by a number of sources.

Bouchard and Kennedy allow for the movement of Secwepemc people to the Arrow Lakes for resource gathering but, citing Teit, they indicate that Secwepemc visits to the Arrow Lakes were seasonally limited. According to Teit, the Shuswap:

> *"were always on good terms with the Lakes and often hunted and fished with them. They very seldom wintered on any part of the lakes or river however. Numbers of them came across the mountains to Revelstoke where sometimes in the fall there were as many Shuswap as Lakes. At the end of the fishing and berrying these people went up the Columbia on trapping and hunting expeditions or returned to Shuswap Lake. The other place where the*

[16] Regarding the antiquity of these kinds of trips, Bouchard and Kennedy remark on Teit's conclusion that Secwepemc peoples went to the Arrow Lakes. Consistent with their work, Bouchard and Kennedy are supportive of a Lakes perspective on these visits. They write: "... Teit did record, in notes he made in May 1909, that the Shuswap occasionally came to the Arrow Lakes to get resources -- he also noted that when the Shuswap did so, they were consciously visiting Lakes territory" (Bouchard and Kennedy 2005:52).

> *Shuswap reached the Lakes was by the Fire Valley trail to lower Arrow Lake. They sometimes stayed most of the fall hunting cariboo and fishing. These people came from Spallumcheen and generally returned home for the winter" (Bouchard and Kennedy 2005:52-53; cf. Teit 1908-1920).*

F. DESCRIPTION OF SECWEPEMC TITLE & RIGHTS

Secwepemc – General

The term Secwépemc derives from the Secwepemctsín (Shuswap language) root – cwep, "to be spread out." With the nominalizer prefix s- and the suffix –emc ("people of a place or kind" it thus means something like "the spread-out people" (Ignace 2011).

Academic presentations of Secwepemcúlecw (Shuswap Territory) identify its position on the interior plateau of western North America. By extension, the Indigenous groups living on the western plateau have been associated with the Plateau Culture area (Walker 1998). The western plateau, says Walker, includes, with a few exceptions, lands drained by the Columbia and Fraser Rivers (Walker 1998:1). In general, the cultures of this region are marked by river settlements, reliance on salmon, game, and root plants, villages as the central political units, some social hierarchies, and trade and marriage throughout the region (Walker 1998:3-5).

Verne Ray notes that the Plateau region is different from surrounding Plains, Great Basin, and Subarctic culture areas (Ray 1939). He also identifies internal differences between different Secwepemc regions including the observation that the Secwepemc peoples in the eastern portions of the territory had more Plains influence in their cultural practices. The influences of the Plains cultures included greater tribal organization and less village autonomy, particularly where fighting and warfare were concerned. Villages retained control over local and peace-time affairs (Ray 1939:10). Ray noted interconnections between villages in the east along waterways and, particularly, lakes. Further, the eastern groups adopted fewer coastal cultural features like class organization than the western Secwepemc (Ray 1939:28). While the Western Fraser Secwepemc did briefly adopt, and then reject some coastal stratification, Simpcwemc rejected coastal *and* Iroquoian/Nakoda/Cree adaptations of social expression, up until late fur trade/early colonial amalgamation of survivor groups dictated an assimilation of some of the more dominant conventions. The fact that major Simpcwemc habitation sites, like Téte Jaune Cache weathered many visitations from diverse influences, suggests that Simpcwemc maintained a vibrant and distinct ethno-cultural profile, providing further understanding beyond Ray's broad descriptions of all Secwepemc.

Similar to other plateau cultures, the Secwepemc teachings of values and traditional laws stem from oral history, mainly stories of Sk'lap (Coyote). Teit provides a description of Coyote's role in the oral history of Secwepemc culture:

> *The ancient story people share the history of creation of the Secwepemc people. At the beginning, the earth was very small, but it gradually became larger, emerging more and more from the waters. The people who inhabited the earth*

> *during this period partook of the characteristics of both men and animals. They were called stspet e kwll. Some were cannibals. At that period many kinds of animals, birds and fishes did not exist, nor many kinds of trees, plants, and berries. The earth was much troubled with great winds, fires and floods. In those days the Old-One sent Coyote to travel over the world and put it to rights. He was gifted with magical power beyond that of all other mythological beings. And had great knowledge and cunning; yet often he proved himself to be selfish, lazy, and vain, doing many foolish and bad tricks. In fact, he was fond of amusing himself and playing ticks on other people, and did away with many evil beings. Although Coyote was a long time on earth and traveled all over it, yet he left much of his work undone… The Old-one was the chief of the ancient world, and finished the work of Coyote and other transformers, leaving the earth in the way we see it present" (Teit 1909:595-596).*

There are numerous stories of coyote throughout Secwepemc territory offering moral teachings on stewardship, respect, and ecological knowledge. One of the most profound stories is of how Coyote brought Salmon to the Secwepemc.

Linguistically, Secwepemctsín is divided into two main dialect regions: Eastern, spoken around Chase and areas further east; and, Western Kamloops; and, Northern, spoken around Kamloops, the North Thompson and areas further west (Bouchard and Kennedy 2005:12; Bouchard and Kennedy 1979). The communities, other than Simpcw, discussed in this report are associated with the Eastern dialect. Teit noted that dialectal differences between Secwepemc groups were "slight" and went on to say "the Shuswap Lake division differs the most, these people have a 'heavy,' labored mode of utterance, and their speech sounds jerky and guttural in comparison with that of other Shuswap" (Teit 1909:456; also cited in Ministry of Justice 2012:7). Simpcwemc have always been associated with a northern/western dialect.

The Eastern Secwepemc

This section emphasizes the histories and cultures of the Eastern Secwepemc, including Splatsin, Sexqeltqin (Adams Lake), Simpcw, Skw'lax (Little Shuswap Lake), Neskonlith, and the Kenpesq't (Shuswap Indian Band). These communities are most directly associated with the upper Columbia River watershed and they have a long history of connection the Arrow Lakes, the Revelstoke area, the Big Bend of the Columbia River, and north to the headwaters of the Canoe Reach (Kinbasket reservoir), and through the areas where the towns of Golden and Invermere are located. Teit characterized these communities as part of the Shuswap Lake Division (including Adams Lake Band, Skw'lax, Little Shuswap, and Splatsin), and the North Thompson Division (including the Shuswap Indian Band and Simpcw) (Teit 1909:460-462). For almost 200 years, the Secwepemc people have had their cultural practices described by outsiders. Records come from fur traders, government officials (British Columbia 1876-1910; British Columbia 1916; Ministry of the Attorney General 2009), academics and consultants (Teit 1900; Teit 1906; Teit 1909; Teit 1930; Dawson 1891; Boas 1891; M. Ignace 1998; M. Ignace 2000; Ignace and Ignace 2004; R. Ignace 2008; Bouchard and Kennedy 2007) and explorers and amateur historians (like Moberly 1865a; see also M. Ignace 2000:3). Secwepemc people have also developed their own accounts of their history (e.g. R. Ignace 2008; Williams n.d.;

LeBourdais 2009). Member communities have also conducted dozens of traditional use studies and other historical studies, and these have provided invaluable and direct contributions to this report (eg. Adams Lake and Neskonlith 1999; Splatsin 2008; 2009; DMCS 2012; 2014; Shuswap Indian Band 2008).

The territories of the Sexqéltkemc Te Secwepemc, Simpcw, and Skw'lax are located in the southern interior of British Columbia. The Shuswap Band and its territory are located in the upper Columbia River Valley near the town of Invermere (Shuswap Indian Band 2008). Culturally, anthropologists identify all Secwepemc peoples as Plateau peoples. They speak Secwepemctsín (Shuswap), an Interior Salish Language (M. Ignace 1998). In much of the historical and anthropological literature, they are referred to as Shuswap people (eg. Teit 1909; see M. Ignace 1998).

In his extensive writings about the Shuswap peoples, Teit emphasizes the groups associated with the North Thompson and the Kamloops regions. He provides, however, some descriptions of the territories of the eastern Secwepemc. In this passage, Teit notes the close cultural and historical ties between the Shuswap Lake Division while also noting ties to the Columbia River region around Revelstoke:

> *The Sxstê'llnEmux ('people of the Sxstêlln'). These comprise the Indians on the Upper South Thompson, Shuswap Lake, and Spallumcheen River [now known as the Shuswap River]. They hunt south along Salmon River, north on Adams Lake to the Columbia above Revelstoke, and east around Mabel and Sugar Lakes to Upper Arrow Lake. Sometimes they hunted even beyond the latter in the mountains east of Lardeau and Nakusp. It seems the Arrow Lakes were more or less disputed ground, a band of Okanagan in Washington claiming them almost to as far north as Revelstoke. On the whole, however, they seem to have been more frequently occupied and utilized by the Shuswap. I shall call these people the Shuswap Lake division (Teit 1909:455).*

Teit further studied the Arrow Lakes area after hearing reports of a small band located in the area. After his investigation were concluded, he retracted is statement of the Arrow Lakes being in Secwepemc territory:

> *In my paper on the Shuswap [Teit 1909] I allowed the Shuswap the territory along the Arrow Lakes almost down to Robson. I had not then been in that district, and was misled by some statements of the Shuswap of the Shuswap Lake region, which appeared to be corroborated by white testimony, I to the effect that the Arrow Lake country was former Shuswap territory, partly occupied in recent years by Colville Indians chiefly for hunting and trapping purposes. This is not correct. The Lake tribe occupied from very early times all the country in British Columbia as outlined on the accompanying map, and I have been unable so far to collect any evidence that any part of the territory was ever occupied by other tribes. Further inquiry among the Shuswap confirms this. The only part seemingly in doubt is the extreme north, the old Revelstoke band having been much mixed with Shuswap (Teit 1910-1913).*

Despite Teit's statements on territorial boundaries, there is information that supports a presence of Secwepemc in the Columbia Basin in the pre-contact era. The Secwepemc (often referred to as the Shuswap in older literature) Territory is one of the largest territories of any single Nation within British Columbia, and also includes an area within Alberta. "The territory of the Secwepemc extends from the Columbia River Valley on the east slope of the Rocky Mountains to the Fraser River on the west and from the upper Fraser River in the north to the Arrow Lakes in the south. Secwepemc territory covers a vast area; approximately 180,000 square km." (Secwepemcúlecw 2016). Within this territory, the 17 living Secwepemc bands have their own territorial borders.[17] Archaeologists recognize that there have been people in this interior plateau region since at least 11,500 YBP (years before present), (Morrissey 2009:11, citing Rousseau 2008), and as research technology improves it is probable this academically-recognized date will be pushed back further. Linguistic and archaeological evidence suggests that Secwepemc ancestors have inhabited the area for at least the last 5,000 YBP (Palmer 1975:31), and likely over 9000 YBP (unpublished archaeological data, Adams Lake Band 2016; Historica Canada 2016), with a basic cultural form going back at least 2,000 YBP, and a similar Interior Plateau form dating to approximately 7,000 YBP (Palmer 1975).

The Gore Creek human remains, a man in his 20s or early 30s, found 40 Km. East of Kamloops, were dated to 8250 ± 115. This date can be considered more accurate than is often the case with ancient human remains in Canada (Cybulski *et al.* 1981:49), because the stratigraphic layers of tephra (typically referred to as ash) from the Mount St. Helens eruption (3200YBP), and the Mount Mazama eruption (almost 7000YBP) are clearly superimposed above the Gore Creek skeleton. Carbon Isotope analysis of his bones indicate his diet included primarily land animal proteins and some marine protein (Chisholm and Nelson 1983:85), "likely Pacific salmon that spawned up river" (Historica Canada 2016).

Oral-historical evidence supports the long antiquity of Secwepemc presence within the Territory. For example, varve lines (annual lamination marks from past glacial lakes), are connected with the time of Coyote the transformer, and remembered as being from a time of a major flood (Ignace 2008:59, quoting Teit 1917:13). Also, recorded orally is the water reversal and Coyote's creation of the annual salmon run in the Thompson River system (just to the West of the Columbia River Valley) by his breaking of the fish weir during the time of the transformers (Ignace and Ignace 2011:22; Ignace 2008:59-61). The history of the first inland salmon run, of which the Secwepemc rely on and are intimately connected to, is remembered as the result of Coyote's actions causing the salmon to go up stream every year.

Approximately 9,750 YBP (minimum date) the bursting of the ice dam, near Spences Bridge, reversed the flow of the Thompson River system, from running into the Columbia to instead run into the Fraser River (Ignace and Ignace 2011:22; Ignace 2008:59-61; see also Johnson 2004; and, Johnson and Brennand 2006). In addition, archaeological evidence suggests 9,000 YBP as a minimum date for human occupation of the nearby lower Fraser Canyon (Johnson 2004:30, see also Borden 1965, 1968). These parallel lines of evidence, combined, supports a history of thousands of years of occupation (Ignace and Ignace 2011:22; Ignace 2008:59-61).

[17] Historically there were 28-32 bands, but the devastating effects of disease wiped out 13 villages. See also Section 1.1.1.f. in this report for more details regarding this number and the remaining bands.

As long as people have lived in the region trails and water transportation routes connected key cultural nodes on the landscape. Many of these traditional transportation routes have now become contemporary roads and trails, see Favrholdt (2000, 2009). The Columbia and Thompson Rivers hold special significance for the Secwepemc Peoples, and were main transportation and subsistence features on the landscape. Smaller rivers and creeks also continue to be important to Secwepemc culture and survival as evidenced by the recurring themes in traditional use interviews of fishing and water transportation (e.g. the interviews conducted as part of Behr *et al*. 2016 publication pending, 2017 publication pending). Some examples of trails which connect to the LSA have been documented by Simpcw FN:

a) BC Min of Attorney General (2011): Figure 5: Upper North Thompson circa 1869s: Trail to Columbia River from North of Chu Chua
b) BC Min of Attorney General (2011): Fig 4 (p.31) & Fig 21 (p.77): Lower North Thompson Territory 1835: Trail from Little Fort/Clearwater area to Columbia River
c) Sketch of Govt Map, E&W, Kootenay 1902 (Jules 2005): Trail to Donald on Columbia River from Tete Jaune Cache, BC (Simpcwul'ecw).

Since European-contact, a variety of maps have been produced by colonizers attempting to understand the complex relationships between different groups of people i.e. the Secwepemc Bands, and the geography of the region. These historical maps, have been useful in painting a partial picture of ways in which Secwepemc Peoples have interacted with their landscape. For example, Teit's 1909 map of Secwepemc ethnographic divisions, see Figure 1, for a portion of this map, which is useful in understanding some of the connections between Secwepemc Bands. However, there are limitations to these historical maps, for example maps showing trail use:

> *Map One [not replicated in this report] only shows trails which were known to and recorded by Europeans and Canadians. These would have been the main trails throughout the region, but there were also many lesser trails which would have remained unknown to traders, miners, settlers, missionaries, and surveyors. Many of these trails are well-known and used today to take contemporary Secwepemc into the farthest reaches of their traditional territory (Elias 2009:12, in his report on Secwepemc uses of the Mica 5 and 6 project areas).*

Secwepemc trails, recorded by explorers and workers, visitors to the Territory, can assist in documenting these networks nonetheless. It is important to note that waterways, especially larger rivers and lakes, formed part of Secwepemc transportation routes that were used in conjunction with trails (Favrholdt 2009). Trail networks of the Columbia Watershed have been documented in previous research, Mica 5 and 6 (Adams Lake Indian Band unpublished), and in the Revelstoke area (Favrholdt 2000, 2014), both are within this LSA. These examples illustrate, that, as it is to this day, the area is widely used, with regular roads and trails providing access to different resources and communication hubs. Although no specific research was done, for this report, on trails only within the LSA, it can be surmised that these networks existed across the entire LSA. "Trails are linear archaeological sites and it has been shown, can be predictors of other archaeological sites such as settlements." (Favrholdt 2009:6, see also ARCAS 1996). Therefore, trails can be pivotal in representing additional ways in which the land was, and is, used by Secwepemc People.

During the preparation of this report, the Surveyor General's Vault of the BC Land Title & Survey Authority (which holds many historical maps), and the University of Victoria's McPherson Library, were visited (see Appendix F, for a list of the additional maps reviewed for this report, which were not available from online sources). These maps show the original reserve boundaries from the late 1800s, as well as explorer's maps which predate the creation of reserves. For example, Geologist, George Dawson, traveled through Secwepemc Territory from in 1877-1890. Also, Walter Moberly, who traveled in Secwepemc Territory, 1865, created maps which frequently show locations such as, "favourite Indian hunting grounds…" and within the same journal, a map indicating where "Indian canoes [are] cached" (Moberly 1865b). Although Moberly does not identify his "Indian" guides by Nation, he always traveled with "Indians" and interviewed people about Indigenous place names. He describes "Indian gardens" of "Indian potato" (wapato) which he passed (Moberly 1865b). See Figure 2 showing an example of one of these journal maps which illustrates how the Illecillewaet[18] River (within the LSA) has been used in the past (see also Bouchard and Kennedy 2005). De Smet's map of the area (1846) also refers to baptizing children and marrying "Indian's", likely Simpcw people (Shook 1997:59-60), see Figure 3.

Secwepemc peoples' access to these important locations have been greatly impeded since colonization. When questioned about land-use in this area Secwepemc Elders pointed out to Ignace (2008) that privatization of land in later decades seriously impacted their ability to access places, much later than initial colonization:

> *While the initial wave of land pre-emptions by settlers occurred between the 1860s and the early 1900s, it was in subsequent decades that more and more fences and "no trespassing signs" went up and impeded our people's travels, hunting and food gathering… (Ignace 2008:158; see also Elias 2009:13).*

This was echoed in interviews conducted with Adams Lake Elders:

> *I have to ask permission now, that is how people are, when we used to walk we would just walk in and people knew you were walking to town or walking to visit people now you can't even cross people's property without asking...Yeah it has become more private property. People can get possessive like even I was to cross the road and use the trail to go to Neskonlith I would have to ask the individuals if I can cross, I never used to have to when I was a kid just go through now we have to tell the person." Adams Lake Elder, 2016 ID1519 (Behr et al. 2016 publication pending).*
>
> *That was a camping area there, but people, the non-Natives, started buying land in there and all of a sudden, one year, we went there to go picking and there was a house somewhere in here [referring to map], and we went in there to pick, and that lady chased us out. She said "this is my land" and I said "when was it your land?" I*

[18] The word Illecillewaet, from which the place name is derived, is an Anglicization of the Secwepemc phrase "we were swimming there" (pers. comm. Dave Nordquist, October 6, 2016). However, its meaning also appears as "swift river" (Rayburn 2001:182). The swift River meaning is likely incomplete, as in the Secwepemc Dictionary swift river is: "to churn (of river); swift water, crelrelátkw^{e}" (SCES 1993:112).

said "we have always been picking berries here, ever year, and we come here and we camp." and she said: well they bought it. So that was the end of our picking there, in that area. I don't know what year it was, but all of a sudden we couldn't pick around there. Adams Lake Elder, 2016 ID2508 (Behr et al. 2016 publication pending).

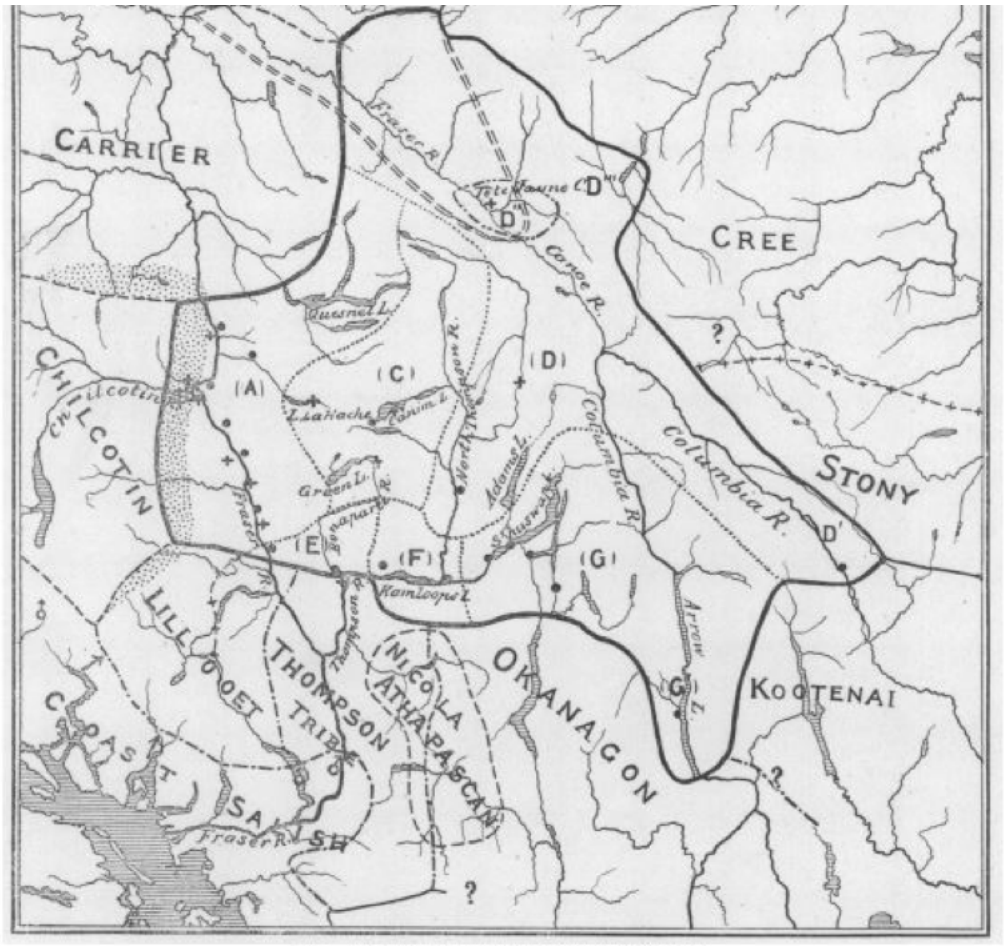


Fig. 199. Map showing the Shuswap Territory.

A, Fraser River Division.
B, Cañon Division, territory now largely occupied by the Chilcotin.
C, Lake Division.
D, North Thompson Division.
D′, Kinbasket.
D″, Former territory of the Iroquois Band.
D‴, Shuswap, Cree, and Iroquois mixed.
E, Bonaparte Division.
F, Kamloops Division.
G, Shuswap Lake Division.
G′, Arrow Lake Band.
●, Villages.
+, Former villages.

Dotted area, territory recently occupied by the Chilcotin. Area at head of Fraser River, enclosed by broken double lines, temporarily occupied by the Sekanai.

Figure 1: A portion of Teit's map 1909:450.

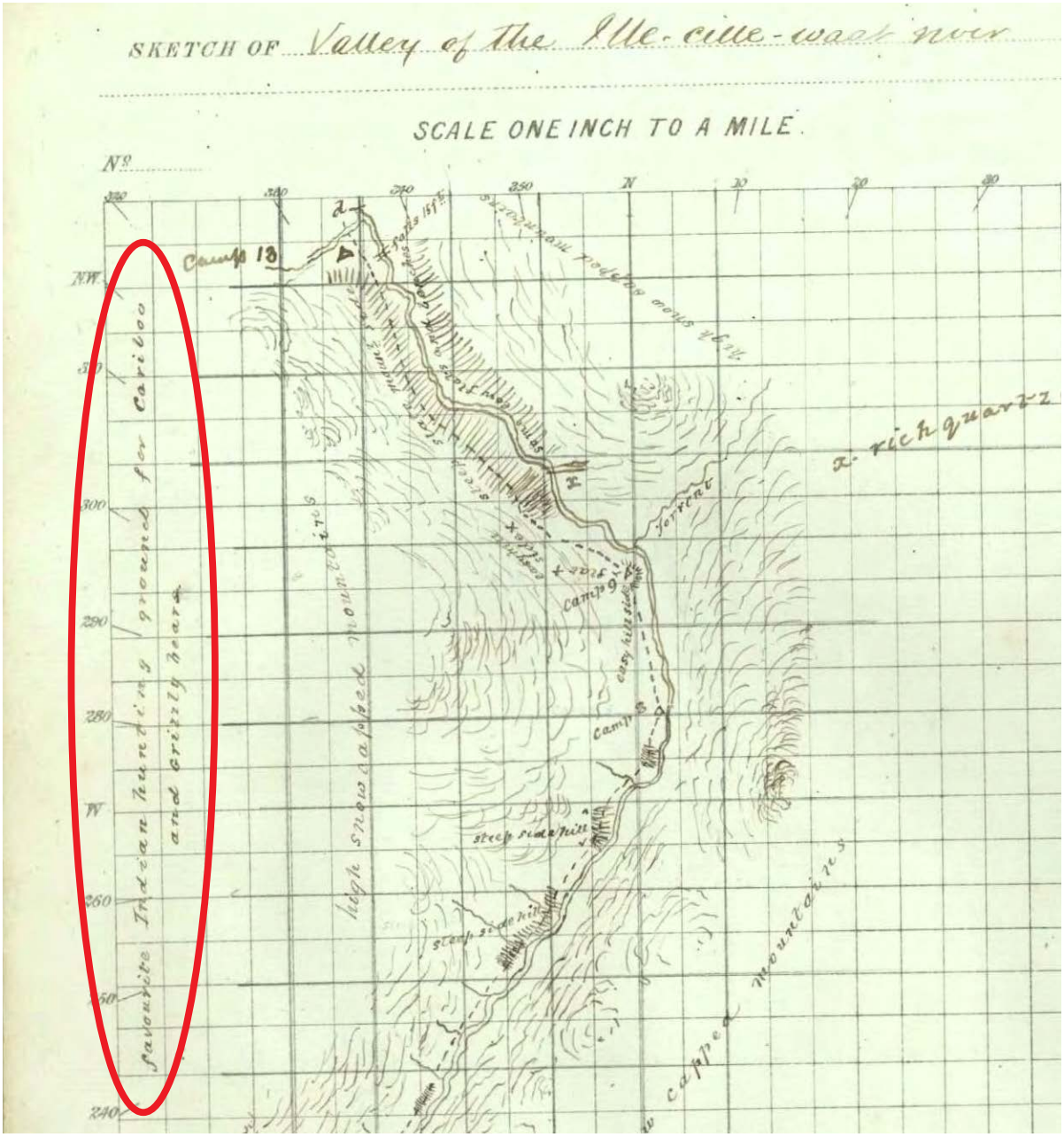


Figure 2: A portion of Moberly's map (1865b) of the Illecillewaet River Valley, with "…Indian hunting ground…" circled in red.

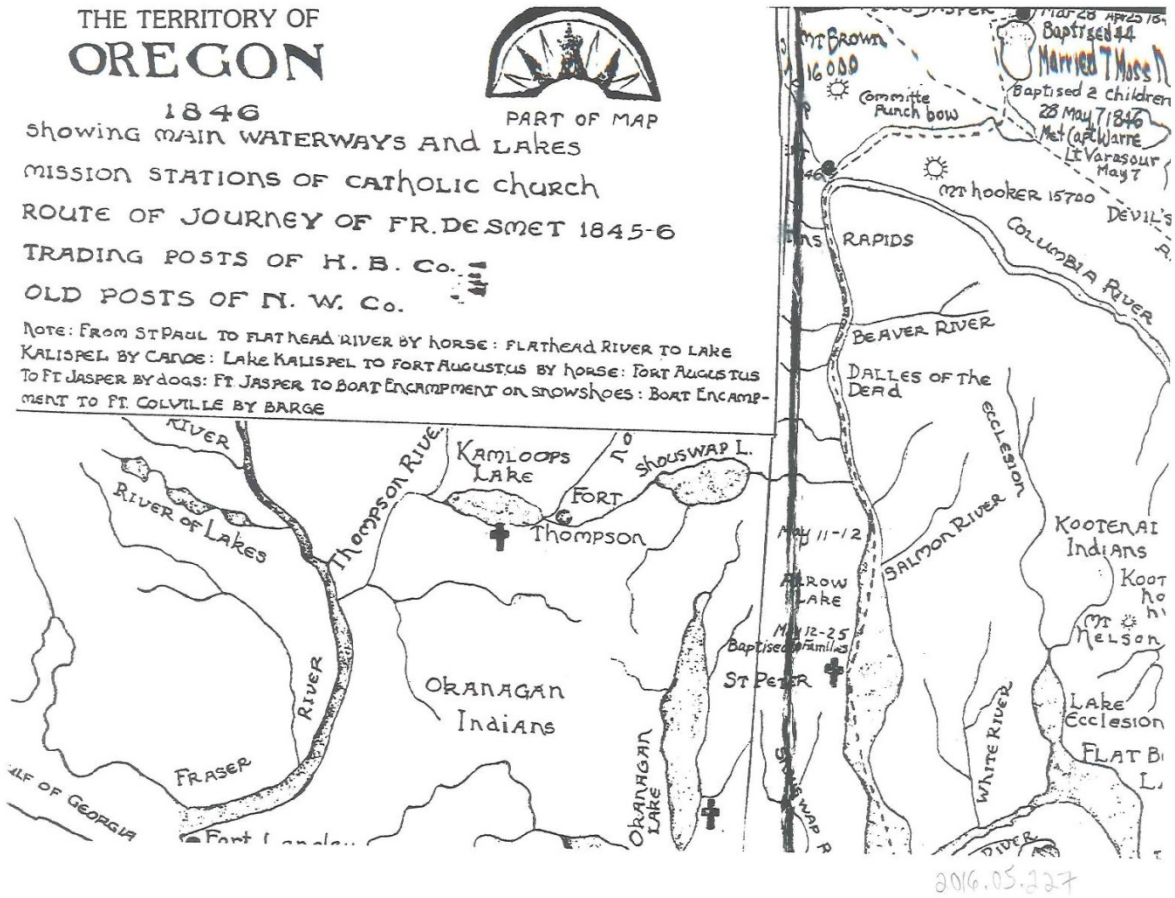


Figure 3: De Smet's map (1846) which indicates baptizing and marrying "Indians" (Shook (1997:59-60).

Historical Secwepemc Economy

Today there are 17 Secwepemc bands including the six, of the Eastern Secwepemc, within this report. Prior to European contact there were 25-32[19] Secwepemc bands. In 1793 Alexander Mackenzie explored Northern Secwepemc Territory with Secwepemc guides assessing the area for the fur trade which would soon take hold (Coffey et al. 1990:7). The subsequent outbreak of a number of diseases including the smallpox epidemic of 1862, which entirely wiped out 13 villages (Coffey et al. 1990:8), accounts for the reduced number of bands.

The Seasonal Round is a description of the economy prior to the Fur Trade. Many elements of the Seasonal Round or traditional economy prior to colonization continue to the current day despite many obstacles. The past economies of the specific Secwepemc bands vary; however, some historical events have had a broad effect on the economies of the entire region and Secwepemc Nation as a whole. Prior to colonial contact, trade networks, between the Northern

[19] This number is not agreed upon within the literature. Teit reported 25 bands prior to the 1860s (see Ignace 1998:203), but others report different numbers, up to as many as 32 bands (Tk'emlúps 2016).

and Southern Secwepemc bands, brought trade items from other areas into the territories. For example, the Northern Secwepemc bands acted as intermediaries between the Southern Secwepemc and the Tsilhqot'in (Cropped Eared Wolf 1996:7, see also Teit 1909:535). Other Nations involved in trading with Secwepemc bands include, the: Carrier [Dakelh], Plains Cree [Nêhiyaw] Stoney [Nakoda], Kootenay [Ktunaxa], Iroquois [Haudenosaunee], and Okanagan [Syilx], with the Secwepemc trading such things as: "Dried salmon, salmon oil, baskets, paint, deer skins, shells and rawhide bags…" (Cropped Eared Wolf 1996:7). European trade items (e.g. brass, copper, iron, and glass beads), had reached the Secwepemc peoples, prior to the arrival of Europeans scouting for fur trading, because of the trade networks which reached from the plains to the coast (Cropped Eared Wolf 1996:11). The fur trade became a major part of the economy which Secwepemc peoples participated in. Fort She-waps, 1812, and Fort Kamloops, 1812 (built by competing companies) were both located near Kamloops and used as trading outposts. By 1827 "...beaver was near extinction in the area." (Cropped Eared Wolf 1996:21, see also Johnson 1937:77). As pelts became unavailable, the existing trade networks and Forts continued to function as trading outposts, although the items traded changed (Cropped Eared Wolf 1996:21, Coffey et al. 1990:15). Cox's descriptions of his journey, including on the Columbia River and through the Canoe Valley and River in May 1817 (Cox 1831), also sheds light on this time period.

Shook (1997:59-60) identifies some of Simpcw's specific historical uses of the LSA as: 1) travel corridor, 2) hunting area, and 3) trade corridor to trade location. One example of this, is: "Leo [Dennis: b. 1875, married Annie Felix John (NTIB/Simpcw), d. 1945] was a noted bear hunter….one spring in the Pat Creek Tributary of the Columbia River he took 12 grizzly and 13 black bears. While taking the skins by raft down the Columbia River to Revelstoke, he was shipwrecked in the Priest Rapids [Dalle d Mort, Priests died there in 1895, Murton & Ferguson 1973]. He lost all his bearskins…."

Following the fur trade, the gold rush was another major colonial impact on the Secwepemc. The first gold at Fort Kamloops was bought by the HBC in 1852 (Coffey *et al.* 1990:19), which had by 1858 become a gold rush (Cropped Eared Wolf 1996:19). Some Secwepemc people participated in mining gold, and others were involved as guides, packers and labourers for other miners (Coffey *et al.* 1990:26). The impact to the traditional economy, and divisions, often created for bureaucratic rational, which arose from the creation of reserves cannot be underestimated. The relationships between Secwepemc Bands remain strong to this day, and although the below section outlines the communities based on Band and reserve divisions, it should be noted that this represents a colonial imposition rather than the divisions past Secwepemc communities considered for themselves. For example, the Sexqeltkemc (Adams Lake, Neskonlith, Splatsin) (Ministry of Attorney General 2012:5-7) represents an important alliance which predates the creation of colonial reserves.

Today, the web page of the Shuswap Nation Tribal Council offers sketches of some of the Eastern Secwepemc groups. Information from these sketches, written by the communities themselves, are further elaborated upon below with information from other sources[20], including language, population and employment statistics maintained by Canadian Government databases (AANDC 2016), and historical literature. While it is not the intention to review each Secwepemc Band's entire history with colonialism and industrial development within this Section C, some notable historical events have occurred which will be considered to understand the present day locations of reserves within the Traditional Territories of the Eastern Secwepemc.

In the past, Adams Lake, Little Shuswap Lake, and Neskonlith were very closely related to each other (Cooperman 1989:2 quoting Teit). In 1862 Magistrate and Assistant Commissioner of Lands and Works (William Cox) met with some Secwepemc Chiefs. Among these was Chief Neskonlith, who asked Cox to mark his lands on the map which Cox was creating (Spirit Map 2016). Chief Neskonlith's lands were marked and this formed the Neskonlith Douglas Reserve. "Cox placed the first stake and the remaining stakes are placed by Chief Neskonlith." (Spirit Map 2016). This original recognition of lands was reduced, when Trutch replaced Douglas, as Governor of BC, and opened this land for pre-emptions in 1867, combining Adams Lake, Little Shuswap Lake and Neskonlith for total cut off lands (Spirit Map 2016; see also Adams Lake and Neskonlith 1999:38-44). This is evidenced on the map which outlines the "Plan of the Salmon Arm Indian Reserves allotted to the Niskahnilth, Adams Lake, & Little Shuswap Lake Tribes" (Vernon and O'Reilly 1889). Between 1913-1916 these lands were further reduced under the McKenna-McBride Royal Commission (Spirit Map 2016).

Today these three Secwepemc Bands, although historically very closely related, operate as primarily separate governing entities, on separate reserves with separate administration. Chief Sehowtken was baptized with the name Adam in 1849, and Adams Lake and Adams River are named after him. Chief Niskonlith was Chief Sehowtken's Grandson, likely by his eldest son: Antoine Gregoire (Cooperman 1989:4).

Sexqeltqín (Adams Lake Indian Band)

f.1. Data Quality

Much of the data used in this section is referenced from the Indigenous and Northern Affairs Canada First Nation Profiles and is derived from Statistics Canada data sources. The Statistics Canada Census data can be challenged in accuracy when representing smaller population. In addition, there have been challenges in obtaining accurate numbers for First Nation community over past Census periods.

[20] One of these sources is Canadian Government-collected statistics (AANDC 2016). To maintain privacy in communities with low populations, where it may be easy to identify an individual, Canada census statistics may be rounded to as much as 5-10%, which can be a significant distortion of numbers when dealing with communities of approximately 300 persons. See stats Canada website for further information about their privacy policy (AANDC 2016).

Furthermore, a unique challenge emerged for the 2011 Census when the Federal Government abandoned the long-form Census and replaced it with the National Household Survey (NHS). Given the low response rate, this creates challenges for the accuracy of data such as education, experienced labour force, labour force participation, and personal and household income data for communities with smaller populations.

Specifically, for the 2011 NHS estimates, the global non-response rate (GNR) is used as an indicator of data quality. This indicator combines complete non-response (household) and partial non-response (question) into a single rate. The value of the GNR is presented to users. A smaller GNR indicates a lower risk of non-response bias and as a result, lower risk of inaccuracy. The threshold used for the estimates' suppression is a GNR of 50% or more. For the Sexqeltqín main populated reserve, the GNR was 22.9% (Statistics Canada. 2016a).

Issues with relying on Census data to represent First Nation communities is that often 50% or more of the member Band population does not reside on the home reserves. In the case of the Sexqeltqin, 381 members or 48% of the total population resides off-reserve. Finally, there will be a number of non-Band members residing on-reserve who will be included in the Census and NHS data. The larger the non-Band resident presence, the more difficult it can be to determine the population characteristics of the on-reserve, own Band population.

f.2. Overview

Teit reported that most of the Band had, in the past, wintered at the outlet and lower portion of Adams Lake, with some of them occasionally wintering on Great and Little Shuswap Lake (Cooperman 1989:2Today, most Adams Lake members living on-reserve live at the foot of Little Shuswap Lake (Cooperman 1989:2). The majority of the administrative offices for Adams Lake are located on this reserve, IR#4, adjacent to the Village of Chase and overlooking Little Shuswap Lake.-They have established a number of services in this community.

Of the seven Adams Lake reserves, Sahhaltkum I.R. 4 (near Chase on Shuswap Lake) is the most populated, and contains the majority of administrative buildings and the Secwepemctsin language immersion school. Switsemalph I.R. 6, located near Salmon Arm, provides health and social services at the Nexe7yélst/Pierre Moyese Centre (AANDC 2016, Adams Lake 2016). The Centre offers a wide variety of programs for both insured and uninsured individuals within the community (e.g. post-natal house calls, specific Elders programs, youth programs).

In addition to the Nexe7yélst/Pierre Moyese Centre, health is supported in the community by having a fitness facility and gymnasium for sports events. Participation in traditional Secwepemc lifeways, such as harvesting traditional foods and medicines, contribute both to the dietary health and positive mental health of the community, as identified throughout this report.

Sexqeltqin has a Comprehensive Strategic Planning Department (CCSPD), and is implementing a comprehensive community strategic plan (Adams Lake 2015). The current Sexqeltqin economic development initiative includes the ownership of The Sexqeltqin Development Corporation (ALDCO). ALDCO initiatives include West Harbour Village, a subdivision geared towards seniors on Shuswap Lake (Adams Lake 2016). The Sexqeltqin Natural Resources Department, which uses Global Information System (GIS) to meet their own mapping needs, is

expanding to offer services to clients in other parts of the province (Adams Lake 2016). Sexqeltqin also has a Recreation and Conference Centre available for rent. In 1990 Sexqeltqin built a log cabin style Spiritual Building, QweQwetsitn, which accommodates 200 people for special events (Adams Lake 2015).

Perhaps the most inspiring of the Adams Lake major facilities, is the Secwepemc language immersion school (T'selcéwtqen Clleqmél'ten, Chief Atahm School). The people who lived in the Adams Lake area, Cstelnec in Secwepemctsin, spoke an Eastern dialect of Secwepemctsin. The state of the Secwepemc language today (the fact that so many young people are learning the language) can be attributed in a large part to the success of the T'selcéwtqen Clleqmél'ten, Chief Atahm School:

> *Our goal is ensuring that kids leave school with a sound education and with a sense of pride in their heritage that was denied their parents and grandparents through a century of colonization and residential schools. (Chief Atahm School, Indspire website 2016).*

f.3. Sexqeltqin Population

As outlined in Table 4, as of November 2016, the Sexqeltqin had a registered population of 799 persons, living both on- and off-reserve. As illustrated, 381 or 48 percent live off-reserve, while the remaining members live on reserve.

Table 4: Registered Sexqeltqin Population By Residency, November 2016

Residency	# of People		
	Male	**Female**	**Total**
Registered On Own Reserve	183	176	359
Registered On Other Reserves	34	25	59
Registered Off Reserve	168	213	381
Total Registered Population	385	414	799

Source: IANAC. 2016

The on-reserve population resides on four of the seven Sexqeltqin reserves (Adams Lake 2016) including:

- Hustalen I.R. 1 (at the South end of Sexqeltqin, at the outlet to Adams River);
- Sahhaltkum I.R. 4 (on the South Thompson River, Southwest of Little Shuswap Lake);
- Squaam I.R. 2 (on the North shore of Squaam Bay, West of Sexqeltqin); and
- Stequmwhulpa I.R. 5 (on the Southwest shore of Little Shuswap Lake), Switsemalph I.R. 6 (on the West shore of Salmon Arm on Shuswap Lake).

f.4. Secwepemctsin Language

The original reason for the decrease in Secwepemctsin being spoken, and which necessitated the creation of the immersion school, has been attributed to residual effects of two key events including:

- Incorporation of Sexqeltqin Band members into the residential school system; and,
- Colonially-imposed participation of Secwepemctsin speakers into a social economy where English has to be learned in order to participate in the job market (Indigenous Foundations 2016; see also the language section of this report, Section 12.2.4).

The Secwepemc language program began in 1987 by parents from Sexqeltqin, Neskonlith, and Little Shuswap Lake, whose work, together, lead to the creation of an immersion program for children from infancy to five years of age. The first of its kind in BC, the program became a school in 1991(T'selcéwtqen Clleqmél'ten, Chief Atahm School website 2016).

> *Now only a handful of people knows Secwepemctsin, and it is an endangered language, on the verge of extinction. There are only about 300 people left who speak it, and most of them are elders. (First Voices website, 2016).*

While only 2% of the Secwepemc population (not just Sexqeltqin, but the whole Nation) is reported as being fluent, 12% are semi-speakers, and 11.5% are learners, this means that an impressive number are learning the language, when compared with other Indigenous languages in BC (FPCC 2014:48). With ongoing community interest to learn Secwepemctsin, knowledge of the language is increasing. In the other communities discussed in this report where statistics are available for the 2006 and 2011 Census reports, there has been an increase in knowledge of the Indigenous language on some reserves, whereas in other communities there has been a decrease. Statistics are not available for Sexqeltqin reserves from the 2006 census, so it is not known whether knowledge of the language is increasing.

Table 5 outlines the language knowledge reported in the 2011 Census for the on-reserve population of the Sexqeltqin First Nation community.

Table 5: Language Statistics for Sexqeltqin On-reserve, 2011.

	Female	Male	Total
Language Knowledge	235	245	480
Aboriginal language(s)	65	45	110
Pop. with Aboriginal languages first learned (%)	10.6	10.0	10.4
Pop. with Aboriginal spoken at home (%)	21.3	16.0	17.7
Pop. with knowledge of Aboriginal lang. (%)	27.7	18.0	22.9

Source: IANAC. 2016

f.5. On-reserve Age Characteristics

Table 6 outlines the age characteristics for the on-reserve population (i.e., all persons living on Sexqeltqin reserves, regardless of whether they are a band member or not) and compares the age categories to the larger Thompson Nicola Regional District. As highlighted, the on-reserve Sexqeltqin population has a much higher share of its population in the under 19-year age category. It also has a much smaller share of its population over the age of 65.

Table 6: Sexqeltqin On-reserve Age Characteristics and Comparison to Thompson Nicola Regional District, 2011.

	Sexqeltqin				**Thompson Nicola RD**
	Male	**Female**	**Total**	**% Share**	**% Share**
Age 0-19	90	70	160	33.3%	21.7%
Age 20-64	135	140	275	57.3%	61.3%
Age 65 and over	20	25	45	9.4%	17.0%
Total All persons	245	235	480	100.0%	100.0%
Median Age	34	36.6	35.3		44.0

Source: IANAC. 2016 and Statistics Canada. 2016b.

The median age of people living on Sexqeltqin reserves (as of 2011) is 35.3 years-old (as compared to the median age of the larger Thompson Nicola Regional District population with an median age of 44.0 years-old).

f.6. On-reserve Household Characteristics

Table 7 highlights the household characteristics of the on-reserve housing for the Sexqeltqin. As illustrated, half the households are couple families, this is similar to the Thompson Nicola Regional District. Sexqeltqin households however, include a larger share of lone parent households than seen at the regional district level. In addition, the median household income is $34,143 compared to $59,385 for the larger Regional District (2011).

Table 7: Sexqeltqin On-reserve Household Characteristics and Comparison to Thompson Nicola Regional District, 2011.

	Sexqeltqin		**Thompson Nicola RD**
Total - All private households	160	100.0%	100.0%
One family households	125		
Couple family households	80	50.0%	54.6%
Female lone parent households	30	18.8%	8.8%
Male lone parent households	15	9.4%	2.7%

	Sexqeltqin		Thompson Nicola RD
Multi-family households	10	6.3%	1.8%
Non-family households	25	15.6%	32.1%
Median household income ($)	34,143		59,385

Source: IANAC. 2016 and Statistics Canada. 2016b.

f.7. On-reserve Education Attainment

Of the 480 residents living on-reserve in 2011, 355 were over 15 years of age (i.e. employable). **Table 8** summarizes the educational attainment of these residents and highlights the high number of both males and females who have obtained trades and apprenticeships or other non-university certificates. As illustrated, Sexqeltqin on-reserve population has a higher share of trades and apprenticeship or other non-university certificate than observed in the larger Thompson Nicola Regional District.

Table 8: Sexqeltqin On-reserve Education Attainment and Comparison to Thompson Nicola Region District, 2011.

	Sexqeltqin				Thompson Nicola RD
Highest Degree or Certificate	**Male**	**Female**	**Total**	**% Share of Total**	**% Share of Total**
No degree, certificate or diploma	60	40	100	28.2%	19.8%
High school diploma or equivalent	50	60	110	31.0%	30.4%
Trades/apprenticeship or other non-university certificate	50	55	105	29.6%	14.1%
University certificate below bachelor level	10	15	25	7.0%	21.7%
University degree (bachelor level or higher)	5	10	15	4.2%	14.1%
Population 15 years and over	175	180	55	100.0%	100.0%

Source: IANAC. 2016 and Statistics Canada. 2016b.

f.8. On-reserve Experienced Labour Force

Table 9 outlines the percentage shares of the on-reserve Sexqeltqin experienced labour force by industrial sector and compares these percentage shares with the larger Thompson Nicola Regional District. As illustrated, there is a large share of the experienced labour force in health and education sector followed by manufacturing and construction industries. Unfortunately, the reliability of the National Household Survey in 2011 Statistics Canada has allocated a large portion of the labour force being allocated to other services, which includes a wide range of activities including, arts, entertainment and recreation; public administration; and, accommodation and food services.

Table 9: Sexqeltqin On-reserve Experienced Labour and Comparison to Thompson Nicola Regional District, 2011.

	Sexqeltqin	Thompson Nicola RD
Population 15 years and over	355	67,415
Agriculture, resource based	5.6%	8.9%
Manufacturing, construction	8.3%	14.0%
Wholesale, retail	5.6%	16.2%
Finance, real estate	5.6%	4.2%
Health, education	25.0%	20.3%
Business services	0.0%	8.7%
Transportation, warehousing	5.6%	6.1%
Other services	44.4%	21.6%
Total	100.0%	100.0%

Source: IANAC. 2016 and Statistics Canada. 2016b.

f.9. On-reserve Labour Force Participation

The 2011 census data for the Sexqeltqin reserve populations shows that almost 23% of the employable population is unemployed, this is much higher than the larger Thompson Nicola Regional District. In addition, the unemployment rate is much higher on-reserve for males than it is for females.

Table 10: Sexqeltqin On-reserve Labour Participation and Comparison to Thompson Nicola Regional District, 2011.

	Sexqeltqin			Thompson Nicola RD		
Labour Force Indicators	Male	Female	Total	Male	Female	Total
Participation rate	54.3%	51.4%	49.3%	66.5%	60.4%	63.4%
Employment rate	37.1%	45.7%	39.4%	59.5%	55.3%	57.3%
Unemployment rate	26.3%	11.1%	22.9%	10.5%	8.6%	9.6%

Source: IANAC. 2016 and Statistics Canada. 2016b.

Neskonlith

f.10. Data Quality

Much of the data used in this section is referenced from the Indigenous and Northern Affairs Canada First Nation Profiles and is derived from Statistics Canada data sources. The Statistics Canada Census data can be challenged in accuracy when representing smaller population. In addition, there have been challenges in obtaining accurate numbers for First Nation community over past Census periods.

Furthermore, a unique challenge emerged for the 2011 Census when the Federal Government abandoned the long-form Census and replaced it with the National Household Survey (NHS). Given the low response rate, this creates challenges for the accuracy of data such as education, experienced labour force, labour force participation, and personal and household income data for communities with smaller populations.

Specifically, for the 2011 NHS estimates, the global non-response rate (GNR) is used as an indicator of data quality. This indicator combines complete non-response (household) and partial non-response (question) into a single rate. The value of the GNR is presented to users. A smaller GNR indicates a lower risk of non-response bias and as a result, lower risk of inaccuracy. The threshold used for the estimates' suppression is a GNR of 50% or more. For the Neskonlith main populated reserve, the GNR was 24.1% (Statistics Canada. 2016a).

Issues with relying on Census data to represent First Nation communities is that often 50% or more of the member Band population does not reside on the home reserves. In the case of the Neskonlith, 334 members or 51% of the total population resides off-reserve. Finally, there will be a number of non-Band members residing on-reserve who will be included in the Census and NHS data. The larger the non-Band resident presences the more difficult it can be to determine the population characteristics of the on-reserve Neskonlith population.

f.11. Overview

Neskonlith has three communities in three locations: IR#1, IR#2 and IR#3. Both IR#1 & IR#2 are located in the Chase area and IR#3 is located adjacent to Salmon Arm. Among Neskonlith's community initiatives, Melamen Centre, located on Switsemalph I.R. 3, coordinates health services including mental health and counselling (Neskonlith 2016). Participation in traditional Secwepemc lifeways, such as harvesting traditional foods and medicines, contribute both to the dietary health and positive mental health of the community, as identified throughout this report.

The current socio-economy of Neskonlith includes band-owned Sk'atsin Resources LLP, which specializes in land-based contracts, e.g. cultural monitoring, environmental monitoring, fence-building, geotechnical drilling, and habitat restoration. Neskonlith is currently developing a Comprehensive Community Plan (publication pending).

Neskonlith is a member of the Shuswap Nation Tribal Council.

f.12. Neskonlith Population

Neskonlith had a registered population of 657 persons in November 2016. This number includes members living on and off reserve. Within this population, 266 members are living on-reserve on one of Neskonlith's three reserves.

Table 11: Neskonlith Population By Residency, November 2016.

Residency	**# of People**		
	Male	**Female**	**Total**
Registered On Own Reserve	139	127	266

Registered On Other Reserves	29	28	57
Registered Off Reserve	167	167	334
Total Registered Population	335	322	657

Source: IANAC. 2016

The on-reserve population resides on three reserves including:

- Neskonlith I.R. 1 (on the west side of the South Thompson River);
- Neskonlith I.R. 2 (on the east side of the South Thompson River); and,
- Switsemalph I.R. 3 (on the West shore of Salmon Arm on Shuswap Lake) (Neskonlith 2016).

Of the three Neskonlith reserves, Neskonlith I.R. 2 is the most populated.

f.13. Sewcepemctsin Language

In 1987 concerned parents from Neskonlith, along with Sexqeltqin Indian Band and Little Shuswap Lake Indian Band, worked together to start a language revitalization program for young children which lead to the creation of a Secwepemctsin immersion school in 1991 on an Adams Lake Indian Band reserve (T'selcéwtqen Clleqmél'ten, Chief Atahm School website 2016). These initiatives contribute to the overall health of the community through cultural continuity.

According to government statistics regarding knowledge of an Indigenous language among on-reserve Neskonlith populations, knowledge of the language is increasing. For example, in 2006, 25.9% of Neskonlith population was identified as having knowledge of an Aboriginal language, while in 2011 32.3% did (IANAC 2016). The table below outlines the language knowledge reported in the 2011 Census for males and females on-reserve. As illustrated, there were approximately 105 Secwepemctsin language speakers on-reserve in 2011.

Table 12: Language Statistics For Neskonlith On-Reserve

	Male	Female	Total
Language Knowledge	175	150	325
Aboriginal language(s)	55	50	105
Pop. with Aboriginal languages first learned (%)	17.1	20	18.5
Pop. with Aboriginal spoken at home (%)	25.7	26.7	26.2
Pop. with knowledge of Aboriginal lang. (%)	31.4	33.3	32.3

Source: IANAC. 2016

f.14. On-reserve Age Characteristics

Table 13 outlines the age characteristics for the on-reserve population (i.e., all persons living on Sexqeltqin reserves, regardless of whether they are a band member or not) and compares the age categories to the larger Thompson Nicola Regional District. As highlighted, the on-reserve Neskonlith population has a much higher share of its population in the under 19-year age category, and a much smaller share in the over 65-year age category.

Table 13: Neskonlith On-Reserve Age Characteristics and Comparison to Thompson Nicola Regional District, 2011

				Neskonlith	Thompson Nicola RD
	Male	**Female**	**Total**	**% Share**	**% Share**
Age 0-19	75	40	115	35.4%	21.7%
Age 20-64	90	100	190	58.5%	61.3%
Age 65 and over	10	10	20	6.2%	17.0%
Total All Persons	175	145	325	100.0%	100.0%
Median Age	36.4	30.4	34.5		44.0

Source: IANAC. 2016 and Statistics Canada. 2016b.

The median age of Neskonlith members living on-reserve in 2011 was 34.5 years old (as compared to the median age of the Thompson Nicola Regional District of 44.0 years).

f.15. On-reserve Household Characteristics

Table 14 highlights the household characteristics of the on-reserve housing for the Neskonlith. As illustrated, approximately 45% of households are couple families. This is a lower share than in the larger Thompson Nicola Regional District. In addition, 25% of Neskonlith on-serve households are female lone parent. This is much higher share than observed at the larger Region.

Table 14: Neskonlith On-reserve Household Characteristics and Comparison to the Thompson Nicola Regional District, 2011.

	Neskonlith		Thompson Nicola RD
	#	**% Share**	**% Share**
Total - All private households	100	100.0%	100.0%
One family households	70		
Couple family households	45	45.0%	54.6%
Female lone parent households	25	25.0%	8.8%
Male lone parent households	0	0.0%	2.7%
Multi-family households	10	10.0%	1.8%
Non-family households	20	20.0%	32.1%
Median household income ($)	,956		$59,385

Source: IANAC. 2016 and Statistics Canada. 2016b.

In addition, the median household income for Neskonlith on-reserve population is $31,956, compared to $59,385 for the larger Region.

f.16. On-reserve Education Attainment

Of the 325 residents living on-reserve in 2011, 240 were over 15 years of age (i.e. employable). **Table 15** summarizes the educational attainment of these residents and highlights the high number of both males and females who have obtained trades and apprenticeships or other non-university certificates. This is much higher than at the larger Thompson Nicola Regional District level. In addition, over 6% of on-reserve residents have received university degrees or higher.

Table 15: Neskonlith On-reserve Education Attainment and Comparison to Thompson-Nicola Regional District, 2011.

	Neskonlith				Thompson Nicola RD
Highest Degree or Certificate	**Male**	**Female**	**Total**	**% Share of Total**	**% Share of Total**
No degree, certificate or diploma		30	70	29.2%	19.8%
High school diploma or equivalent only		30	70	29.2%	30.4%
Trades/apprenticeship or other non-university certificate		40	70	29.2%	14.1%
University certificate below bachelor level		10	15	6.3%	21.7%
University degree (bachelor level or higher)		10	15	6.3%	14.1%
Population 15 years and over	20	120	240	100.0%	100.0%

Source: IANAC. 2016 and Statistics Canada. 2016b

f.17. On-reserve Experienced Labour Force

Table 16 outlines the percentage shares of the on-reserve Neskonlith experienced labour force and compares these percentage shares with the larger Thompson Nicola Region. As illustrated, there is a large share of the experienced labour force in agriculture and the resource based sector followed by wholesale, retail, health and education. Unfortunately, the low reliability of the National Household Survey in 2011has resulted in Statistics Canada allocating a large portion of the labour force to other services which includes a wide range of activities including arts, entertainment and recreation; public administration; and, accommodation and food services.

Table 16: Neskonlith On-reserve Experienced Labour Force and Comparison to Thompson Nicola Regional District, 2011.

	Neskonlith	Thompson Nicola RD
Population 15 years and over	240	67,415
Agriculture, resource based	14.8%	8.9%
Manufacturing, construction	7.4%	14.0%
Wholesale, retail	11.1%	16.2%
Finance, real estate	0.0%	4.2%
Health, education	11.1%	20.3%
Business services	0.0%	8.7%
Transportation, warehousing	0.0%	6.1%
Other services	55.6%	21.6%
Total	100.0%	100.0%

Source: IANAC. 2016 and Statistics Canada. 2016b.

f.18. On-reserve Labour Force Participation

The 2011 census data for the Neskonlith reserve populations shows that almost 35% of the employable population is unemployed. This is much higher than the larger Thompson Nicola Regional District. In addition, the employment rate is much higher for on-reserve females than it is for males.

Table 17: Neskonlith On-reserve Labour Force Participation and Comparison to Thompson Nicola Regional District, 2011.

	Neskonlith			Thompson Nicola RD		
	Male	**Female**	**Total**	**Male**	**Female**	**Total**
Participation rate	58.3%	65.2%	60.4%	66.5%	60.4%	63.4%
Employment rate	33.3%	47.8%	41.7%	59.5%	55.3%	57.3%
Unemployment rate	35.7%	33.3%	34.5%	10.5%	8.6%	9.6%

Source: IANAC. 2016 and Statistics Canada. 2016b.

Splatsin

f.19. Data Quality

Much of the data used in this section is referenced from the Indigenous and Northern Affairs Canada (IANAC) First Nation Profiles and is derived from Statistics Canada data sources. The Statistics Canada Census data can be challenged in accuracy when representing smaller population centres. In addition, there have been challenges in obtaining accurate numbers for First Nation communities over past Census periods.

Furthermore, a unique challenge emerged for the 2011 Census when the Federal Government abandoned the long-form Census and replaced it with the National Household Survey (NHS). Given the low response rate, this created special challenges on the reliability for data such as education, experienced labour force, labour force participation, and personal and household income data for these communities.

Specifically, for the 2011 NHS estimates, the global non-response rate (GNR) is used as an indicator of data quality. This indicator combines complete non-response (household) and partial non-response (question) into a single rate. The value of the GNR is presented to users. A smaller GNR indicates a lower risk of non-response bias and as a result, lower risk of inaccuracy. The threshold used for the estimates' suppression is a GNR of 50% or more. For the Splatsin main populated reserve, the GNR was 28.2% (Statistics Canada. 2016a).

The issue with relying on Census data to represent First Nation communities is that often 50% or more of the member Band population does not reside on the home reserves. In the case of the Splatsin, 496 members or 55% of the total population resides off-reserve. Finally, there will be a number of non-Band members residing on-reserve who will be included in the Census and NHS data. The larger the non-Band resident presence, the more difficult it can be to determine the population characteristics of the on-reserve Splatsin population.

f.20. Overview

The Splatsin people reside on Indian reserve lands adjacent to the City of Enderby to the south and across the Shuswap River to the east. The Splatsin are the most southern tribe of the Secwepemc Nation, the largest Interior Salish speaking First Nation in Canada whose aboriginal territory stretches from the BC and Alberta border near the Yellowhead Pass to the plateau west of the Fraser River, southeast to the Arrow Lakes and to the upper reaches of the Columbia River. The Shuswap River was an integral transportation route used to travel from village to village and to food gathering areas of the Splatsin. The Splatsin or 'Spallumcheen', the anglicized name they are commonly referred to as, are governed by an elected Chief and Council.

The Splatsin historian and linguist, the late Cyndi Williams, described Splatsin this way:

> *Splatsin is pronounced 'sblajeen' and means the riverbanks, where the Splatsinac lived, along the Shuswap River between Mabel Lake which is the headwater, to Sicamous, which comes from another Shuswap word meaning 'in between' ... The Eagle River empties into the Shuswap Lake [at Sicamous] and the greater winter village was located at its mouth… In the Enderby area, as with the other tribes, a different dialect is spoken but they can usually understand one another as there are a lot of similarities within the language.*

Enderby I.R. 2 is the main Splatsin reserve with the largest population, all of the three reserves community facilities, including the Splatsin Community Centre, which includes meeting rooms, a gymnasium and conference hall, and catering services. The building was designed with native plant landscaping, a vegetative roof, and is designed to resembles the Secwepemc *c ,[7] istkten* winter dwelling pithouse (Splatsin 2016).

Splatsin Health Services provides medical services and in addition offers support in the form of counseling, as well as recreational activities for youth (Splatsin 2016). Participation in traditional Secwepemc lifeways, such as harvesting traditional foods and medicines, contribute both to the dietary health and positive mental health of the community, as identified throughout this report.

Splatsin's current economic base includes the Splatsin Development Corporation. This Corporation oversees or partners with a number of companies, such as: Quilakwa Investments Ltd, which operates the Quilakwa Gas Station (Quilakwa Centre also has a Tim Horton's and artisan gallery), Convenience Store and RV Park; Splatsin Construction Services LLP (which is partnered with Landmark Solutions Ltd); Monashee Community Forest (partnered with the Village of Lumby), (Splatsin 2016).

In 2007 the band-owned natural resource management company Yucwmenlúcwu (Caretakers of the Land) LLP was initiated to provide forestry, environmental and archaeological services. Yucwmenlúcwu is also overseen by the Splatsin Development Corporation.

In addition, agriculture is identified in Splatsin's 2013 comprehensive community plan, for future economic growth. Splatsin already operates three farms, one vineyard, one cattle forage operation, and one nursery, and intends to expand in the future (Splatsin 2013:42).

Splatsin is a member of the Shuswap Nation Tribal Council.

f.21. Splatsin Population

Splatsin (formerly referred to in ethnographic literature as Spallumcheen) has a registered population of 895 persons in November 2016. This number includes members living on and off reserve. Within this population, 325 members are living on-reserve on two of Splatsin's three reserves.

Table 18: Splatsin Population By Residency, November 2016.

	# of People		
	Male	**Female**	**Total**
Registered On Own Reserve	170	155	325
Registered On Other Reserves	42	31	73
Registered Off Reserve	219	278	497
Total Registered Population	431	464	895

Source: IANAC. 2016

The two populated reserves include:

- Enderby I.R. 2 (at Enderby on the Shuswap River at the mouth of Fortune Creek), and,
- Salmon River I.R. 1 (Splatsin, on the east side of the Salmon River, slightly to the South of Glenemma).

The third reserve, Sicamous I.R. 3 (on the West shore of Mara Lake, slightly to the South of Sicamous, C.P. Station), is currently unpopulated.

f.22. Secwepemctsin Language

The 2013 comprehensive community plan identified earlier also identifies the Secwepemctsin language as being of concern, and outlines some goals for how to increase language acquisition to support cultural continuity (Splatsin 2013:52).

> *Our culture and language link us with our ancestors and they define who we are. Our culture applies to every aspect of our lives, our lifestyles, ceremonies, customs, rituals, and most importantly, our values. Through living with respect, generosity, and sharing, we connect with our traditional beliefs, giving us a sense of belonging and a spiritual foundation. Our language expresses the richness of our culture and by learning the language, we gain a better understanding of our history and our values (Splatsin 2013:51).*

Community planning to revitalize the Secwepemc language is timely. According to government statistics regarding knowledge of Indigenous languages among on-reserve Splatsin populations, speaking Secwepemctsin appears to be decreasing. For example, in 2006 33.3% of the population was identified as having knowledge of an Aboriginal language, while in 2011 only 15.4% did. See **Table 19**.

Table 19: Language Statistics For Splatsin On-reserve, 2011.

	Male	Female	Total
Language Knowledge	220	230	455
Aboriginal language(s)	30	40	70
Pop. with Aboriginal languages first learned (%)	6.8	10.9	8.8
Pop. with Aboriginal spoken at home (%)	9.1	13	9.9
Pop. with knowledge of Aboriginal lang. (%)	13.6	17.4	15.4

Source: IANAC. 2016

f.23. On-reserve Age Characteristics

Table 20 outlines the age characteristics for the on-reserve population (i.e., all persons living on Splatsin reserves, regardless of whether they are a band member or not) and compares the age categories to the larger North Okanagan Regional District. As highlighted, the on-reserve Splatsin population has a much higher share of its population in the under 19-years of age category than observed in the North Okanagan Regional District. In addition, the Splatsin on-reserve population is made up of a much smaller share of population over the age of 65 years than seen in the larger region.

Table 20: Splatsin On-reserve Age Characteristics and Comparison with North Okanagan Regional District, 2011.

	Splatsin				North Okanagan RD
	Male	**Female**	**Total**	**% Share**	**% Share**
Total All persons	220	235	455	100.0%	100.0%
Age 0-19	85	75	160	35.2%	21.3%
Age 20-64	115	135	250	54.9%	57.7%
Age 65 and over	20	25	45	9.9%	21.0%
Median Age	35.6	36.1	35.8		47.2

Source: IANAC. 2016 and Statistics Canada. 2016b.

The median age of people living on Splatsin reserves (as of 2011) is 35.8 years-old, as compared to the median age of the North Okanagan Regional District, which has a median age of 47.2 years.

f.24. On-reserve Household Characteristics

Table 21 highlights the household characteristics of the on-reserve housing for the Splatsin. As illustrated, approximately 44% of households are couple families. This is smaller share than observed for the larger North Okanagan Regional District. In addition, the share of lone parent families is much higher than in the larger region. The median household income for Splatsin on-reserve was $30,006 compared to $53,647 for the larger Region.

Table 21: Splatsin On-reserve Household Characteristics and Comparison with North Okanagan Regional District, 2011.

	Splatsin		North Okanagan RD
	#	**% Share**	**% Share**
Total - All private households	170	100.0%	100.0%
One family households	110		
Couple family households	75	44.1%	56.8%
Female lone parent households	30	17.6%	8.3%
Male lone parent households	10	5.9%	2.4%
Multi-family households	0	0.0%	1.6%
Non-family households	55	32.4%	31.0%
Median household income ($)	$30,006		$53,647

Source: IANAC. 2016 and Statistics Canada. 2016b.

f.25. On-reserve Education Attainment

Of the 455 residents (including Splatsin members and other residents) living on-reserve in 2011, 325 were over 15 years of age (i.e. employable). **Table 22** summarizes the educational attainment of these residents and highlights the high number of both males and females who have obtained trades and apprenticeships or other non-university certificates. In fact, Splatsin on-reserve population is twice the rate observed at the larger North Okanagan Regional District.

Table 22: Splatsin On-reserve Education Attainment and Comparison to the North Okanagan Regional District, 2011.

	Splatsin				North Okanagan RD
Highest Degree or Certificate	**Male**	**Female**	**Total**	**% Share of Total**	**% Share of Total**
No degree, certificate or diploma	50	60	110	33.8%	19.6%
High school diploma or equivalent only	45	55	100	30.8%	29.8%
Trades/apprenticeship or other non-university certificate	50	45	95	29.2%	14.4%
University certificate below bachelor level	0	10	10	3.1%	23.7%
University degree (bachelor level or higher)	0	10	10	3.1%	12.5%
Population 15 years and over	145	180	325	100.0%	100.0%

Source: IANAC. 2016 and Statistics Canada. 2016b.

f.26. On-reserve Experienced Labour Force

Table 23 outlines the percentage shares of the on-reserve Splatsin experienced labour force and compares these percentage shares with the larger North Okanagan Regional District. As illustrated, there is a large share of the Splatsin on-reserve experienced labour force in wholesale and retail, and manufacturing and construction. Unfortunately, the low reliability of the National Household Survey in 2011 has resulted in Statistics Canada allocating a large portion of the labour force to other services, which includes a wide range of activities including, arts, entertainment and recreation; public administration; and, accommodation and food services.

Table 23: Splatsin On-reserved Experienced Labour Force and Comparison to North Okanagan Regional District, 2011.

	Splatsin	North Okanagan RD
Population 15 years and over	325	40,125
Agriculture, resource based	7.5%	8.6%
Manufacturing, construction	15.0%	18.3%

	Splatsin	North Okanagan RD
Wholesale, retail	17.5%	18.7%
Finance, real estate	0.0%	4.4%
Health, education	12.5%	18.0%
Business services	5.0%	9.7%
Transportation, warehousing	5.0%	3.9%
Other services	37.5%	18.4%
Total	100.0%	100.0%

Source: IANAC. 2016 and Statistics Canada. 2016b.

f.27. On-reserve Labour Force Participation

The 2011 census data for the Splatsin reserve populations shows that almost 30% of the employable population is unemployed. In addition, the unemployment rate is much higher for on-reserve males (37.5%) compared to females (22.2%). When compared to the North Okanagan Regional District, the Splatsin on-reserve population has a much higher unemployment rate.

Table 24: Splatsin On-reserve Labour Force Participation and Comparison to North Okanagan Regional District, 2011

	Splatsin			North Okanagan RD		
Labour Force Indicators	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**
Participation rate (%)	51.6%	51.4%	52.3%	64.7%	55.2%	59.7%
Employment rate (%)	32.3%	40.0%	38.5%	58.1%	50.5%	54.1%
Unemployment rate (%)	37.5%	22.2%	29.4%	10.2%	8.5%	9.4%

Source: IANAC. 2016 and Statistics Canada. 2016b.

Simpcw

f.28. Data Quality

Much of the data used in this section is referenced from the Indigenous and Northern Affairs Canada First Nation Profiles and is derived from Statistics Canada data sources. The Statistics Canada Census data can be challenged in accuracy when representing smaller population. In addition, there has been challenges in obtaining accurate numbers for First Nation community over past Census periods.

Furthermore, a unique challenge emerged for the 2011 Census when the Federal Government abandoned the long-form Census and replaced it with the National Household Survey (NHS). Given the low response rate, this creates challenges for the accuracy of data such as education, experienced labour force, labour force participation, and personal and household income data for communities with smaller populations.

Specifically, for the 2011 NHS estimates, the global non-response rate (GNR) is used as an indicator of data quality. This indicator combines complete non-response (household) and partial non-response (question) into a single rate. The value of the GNR is presented to users. A smaller

GNR indicates a lower risk of non-response bias and as a result, lower risk of inaccuracy. The threshold used for the estimates' suppression is a GNR of 50% or more. For the Simpcw main populated reserve, the GNR was 20.8% (Statistics Canada. 2016a).

Issues with relying on Census data to represent First Nation communities is that often 50% or more of the member Band population does not reside on the home reserves. In the case of the Simpcw, 471 members or 66% of the total population resides off-reserve. Finally, there will be a number of non-Band members residing on-reserve who will be included in the Census and NHS data. The larger the non-Band resident presence, the more difficult it can be to determine the population characteristics of the on-reserve Simpcw population.

f.29. Overview

Simpcw is a northern division of the larger Secwempc Nation, and as such has for millennia occupied the North Thompson River watersheds and tributary drainages, from south of present day McClure, and well north above the headwaters of the Fraser River, from Tete Jaune Cache to Goat River, east through the Yellowhead Pass to Jasper and south through the Kinbasket and watersheds of the Athabasca River, with western boundaries in the Wells and Caribou Mountains, and central Plateau Lakes country.

Evidence of Simpcwemc ancestral and continuous occupation of Simpcwul'ecw is found in the archaeological record, which supports the oral histories and inherited knowledge of Simpcwemc, through the use of c -sistent, ea se w i nter homes, and attendant food and fur cache sites at a variety of upper and lower elevations throughout Simpcwul'ecw, including those sites joined by well known trails networks between Pesqlélten (Finn Creek), Tska 7 (Tum Tum), and the Canoe River Corridor, now lying beneath the Kinbasket and Revelstoke Reservoirs.
While seasonally and selectively relying on salmon and lake fish, Simpcwemc are also historically observed to render a good living from trapping and hunting and were renowned for their ability conduct successful game harvest on all elevations, particularly in the carefully orchestrated pursuit of Mountain caribou, in the Wells/Caribou, Upper Fraser and Canoe/Kinbasket/Columbia watersheds and ranges.

Technologies specifically designed for such harvests included complex riverine weir and net systems and spearing for salmon, harpooning and dragging for sturgeon, ice-fishing and pitch-lamping for lake fish, snares for deer and small game, dead-fall traps for bear, and corral and wing systems for caribou and elk. Plant product harvest, which took place during most of the year, required intergenerational expertise, and intimate knowledge of regional ecosystems and species distribution. Equally complex harvest processing (including hide removal and tanning, meat butchering, portioning and smoking/drying) and base camp and transport systems, and a reliance on migratory game gave rise to some regional variation from other Secwepemc, in Simpcwemc dress, diet and inherited knowledge.

However, it is the ancient and continuous Simpcwemc use of the Northern Secwepemc linguistic dialect, expansive and inter-ethnolinguistic Simpcwemc trade and commerce networks and relations, that distinguish Simpcwemc from other groups in the Secwepemc nation. Simpcw provided an intermediary trade conduit between Eastern Slope sources and markets, and those of

the Plateau, long prior to but particularly in the (regional) proto-contact and early contact periods (1780's-1830's).

On the whole, Simpcwemc traders and travelers maintained consistently and mutually beneficial relations with external groups, as well as with other Secwepemc, but Simpcw was not without the capacity to defend Simpcwul'ecw when the occasion arose. For example, in a carefully orchestrated, Simpcw-led confederacy involving individuals from other Secwepemc communities, responding to the call to arms around 1789-90, a group of homeless Sekani who had been squatting and pilfering in northern Simpcwul'ecw were soundly expelled and largely exterminated, never to return.

Today, Simpcw's First Nation's Community Planning Report (Simpcw FN 2015a) includes a continued focus on its Title and Rights research, which considers landmark court case decisions and outcomes, clarifying and verifying archival and externally produced observations of Simpcwemc and Simpcwul'ecw, and improving the electronic storage and recall of its expansive collection of cultural source materials.

> *"First Nations people know that humans are part of the environment. We are not separate from it and so what we do to the environment—to support it, or harm it—we do to ourselves. Our ancestors planned and acted in a way that ensured our livelihood, clean water, air, forests, plants, fish and animals. It is our responsibility as the current generation to learn from our past and plan for our future so that current decisions reflect long-term sustainability. The impact of our decisions and actions on the environment is not an 'add-on' for review but must be a core component. To remind us of this and to bring it to the forefront of our minds, a priority CCP goal is 'to maintain healthy land and water for future generations by bringing environmental responsibility and respect into all our decisions.'" (Simpcw FN 2015a:25, section 5.1.3).*

Simpcwul'ecw (Simpcw Territory), described by Teit (1909) and Marianne Ignace (1998) includes a large portion of the Adams Lake and all of the Upper Adams River. Teit and Ignace name it the North Thompson Division, which includes the Kinbasket, the Upper North Thompson Band (Upper Fraser and Robson River Valleys, Jasper, Big Bend[21] of the Columbia as described above) and the Lower North Thompson Band (which at that time included the

[21] George Simpson's Journals refer to Simpcw's ancestors being in the Big Bend area in 1824 (Merk 1931:30, see also Robertson 2009:18): "…were preparing to go on a War Expedition [1824] against a poor helpless inoffensive tribe of Indians "Shewhoppes", natives of the North branch of Thompsons River knowing them to be weak and unprovided with the means of defense and solely with a view to plunder and gain themselves renown as Warriors by taking a few Scalps without incurring danger...I have been anxious to encourage those Indians to frequent the Establishment in the Mountain [Rocky Mountain House, according to the Merk footnote] in order to draw them from Thompsons River as in the event of their being prevailed on to go the former place for their supplies and with their returns we should be enabled to abandon that heavy and unprofitable Establishment [Fort Thompson, according to a Merck footnote] for a Year or two, but this unprovoked warfare was likely to defeat my plans; on the score of humanity as well of interest. I therefore spoke my Mind very plainly to those freemen, told them we meant to protect the Shewhoppes and if they did not instantly abandon their cruel intentions they should not this Winter have even a particle of ammunition at any of our Establishments and that next Season they should be bundled down to Canada where starvation & misery would follow them. This lecture had the desired effect and they promised that they would no longer entertain hostile feelings towards those people. Those freemen are fully in our power and if they break their promise I shall keep my word in regard to them."

current Canim Lake Indian Band)—formerly known as Canoe Lake—reserves established 4 years after the Teit map in 1913: Zacharias 1992, see Figure 2, DIA 1891 below), and the current Simpcw/NTIB reserves, established 1877 (UBCIC 2016). Shuswap Band was established at Windemere in 1884 they arrived in that area in 1840s (Evans 2009).

f.30. Simpcw Population

Simpcw has a registered population of 718 persons in November 2016. This number includes members living on and off reserve. Within this population, 220 members are living on-reserve at two of Simpcw's five reserves.

Table 25: Simpcw Population By Residency, November 2016

	# of People		
	Male	**Female**	**Total**
Registered On Own Reserve	110	110	220
Registered On Other Reserves	14	13	27
Registered Off Reserve	216	255	471
Total Registered Population	340	378	718

Source: IANAC. 2016

f.31. Secwepemctsin Language

Table 26 outlines the language knowledge reported in the 2011 Census for the on-reserve population of the Simpcw First Nation.

Table 26: Language Statistics for Simpcw On-reserve, 2011

	Male	**Female**	**Total**
Language Knowledge	135	125	260
Aboriginal language(s)	n/a	n/a	15
Pop. with Aboriginal languages first learned (%)	7.4	12	5.8
Pop. with Aboriginal spoken at home (%)	n/a	n/a	3.8
Pop. with knowledge of Aboriginal lang. (%)	n/a	n/a	5.8

Source: IANAC. 2016

f.32. On-reserve Age Characteristics

Table 27 outlines the age characteristics for the on-reserve population (i.e., all persons living on Simpcw reserves, regardless of whether they are a band member or not) and compares the age categories to the larger Thompson Nicola Regional District. As highlighted, the on-reserve Simpcw population has a much higher share of its population in the under 19-years of age category than observed in the larger Thompson Nicola Regional District.

Table 27: Simpcw On-reserve Age Characteristics and Comparison with Thompson Nicola Regional District, 2011.

	Simpcw				Thompson Nicola RD
	Male	**Female**	**Total**	**% Share**	**% Share**
Age 0-19	40	40	80	30.8%	21.7%
Age 20-64	85	75	160	61.5%	61.3%
Age 65 and over	10	10	20	7.7%	17.0%
Total All persons	135	125	260	100.0%	100.0%
Median Age	36.7	44.6	39.1		44.0

Source: IANAC. 2016 and Statistics Canada. 2016b.

The median age of Simpcw members living on-reserve in 2011was 39.1 years-old (as compared to the median age of the Thompson Nicola Regional District of 44.0 years).

f.33. On-reserve Household Characteristics

Table 28 highlights the household characteristics of the on-reserve housing for the Simpcw. As illustrated, approximately 48% of households are couple families, this is similar to the larger Thompson Nicola Regional District. Simpcw median household income has increased from 31,552 in 2006 to $40,895 in 2011, an increase of almost 30%. However, the median household income of the Simpcw on-reserve of $40,895 still lags the rate of $59,385 observed for the larger Region.

Table 28: Simpcw On-reserve Household Characteristics and Comparison with Thompson Nicola Regional District, 2011

	Male	**Female**	**Total**
Language Knowledge	135	125	260
Aboriginal language(s)	n/a	n/a	15
Pop. with Aboriginal languages first learned (%)	7.4	12	5.8
Pop. with Aboriginal spoken at home (%)	n/a	n/a	3.8
Pop. with knowledge of Aboriginal lang. (%)	n/a	n/a	5.8

Source: IANAC. 2016 and Statistics Canada. 2016b.

f.34. On-reserve Education Attainment

Of the 260 residents (including Simpcw members and other residents) living on-reserve in 2011, 200 were over 15 years of age (i.e. employable). **Table 29** summarizes the educational attainment of these residents and highlights the high number of both males and females who have obtained trades and apprenticeships or other non-university certificates and has a rate that is much higher than observed at the larger Thompson Nicola Regional District.

Table 29: Simpcw On-Reserve Education Attainment Comparison to the Thompson Nicola Regional District, 2011.

	Simpcw				Thompson Nicola RD
	Male	**Female**	**Total**	**% Share**	**% Share**
Age 0-19	40	40	80	30.8%	21.7%
Age 20-64	85	75	160	61.5%	61.3%
Age 65 and over	10	10	20	7.7%	17.0%
Total All persons	135	125	260	100.0%	100.0%
Median Age	36.7	44.6	39.1		44.0

Source: IANAC. 2016 and Statistics Canada. 2016b.

f.35. On-reserved Experienced Labour Force

Table 30 outlines the percentage shares of the on-reserve Simpcw experienced labour force and compares these percentage shares with the larger Thompson Nicola Regional District. As illustrated, there is a large share of the Simpcw on-reserve experienced labour force in wholesale and retail, and manufacturing and construction. Unfortunately, the low reliability of the National Household Survey in 2011 has resulted in Statistics Canada allocating a large portion of the labour force to other services, which includes a wide range of activities including, arts, entertainment and recreation; public administration; and, accommodation and food services.

Table 30: Simpcw On-reserve Experienced Labour Force and Comparison to Thompson Nicola Regional District, 2011.

	Simpcw	Thompson Nicola RD
Population 15 years and over	205	67,415
Agriculture, resource based	14.8%	8.9%
Manufacturing, construction	11.1%	14.0%
Wholesale, retail	0.0%	16.2%
Finance, real estate	0.0%	4.2%
Health, education	22.2%	20.3%
Business services	0.0%	8.7%
Transportation, warehousing	0.0%	6.1%
Other services	51.9%	21.6%
		100.0%

Source: IANAC. 2016 and Statistics Canada. 2016b.

f.36. On-reserve Labour Force Participation

The 2011 census data for the Simpcw reserve populations shows that 23% of the employable population is unemployed. This is much higher than the larger Thompson Nicola Regional District. When compared to the Thompson Nicola Regional District, the Simpcw on-reserve population does not enjoy the same level of employment participation as the larger region.

Table 31: Simpcw On-reserve Labour Force Participation and Comparison to Thompson Nicola Regional District, 2011.

	Simpcw			Thompson Nicola RD		
	Male	**Female**	**Total**	**Male**	**Female**	**Total**
Participation rate	63.6%	63.2%	63.4%	66.5%	60.4%	63.4%
Employment rate	40.9%	57.9%	48.8%	59.5%	55.3%	57.3%
Unemployment rate	28.6%	n/a	23.1%	10.5%	8.6%	9.6%

Source: IANAC. 2016 and Statistics Canada. 2016b.

Kenpesq't (Shuswap Band)

f.37. Data Quality

Much of the data used in this section is referenced from the Indigenous and Northern Affairs Canada First Nation Profiles and is derived from Statistics Canada data sources. The Statistics Canada Census data can be challenged in accuracy when representing smaller population. In addition, there have been issues in obtaining accurate numbers for First Nation community over past Census periods.

Furthermore, a unique challenge emerged for the 2011 Census when the Federal Government abandoned the long-form Census and replaced it with the National Household Survey (NHS). Given the low response rate, this creates challenges for the accuracy of data such as education, experienced labour force, labour force participation, and personal and household income data for communities with smaller populations.

Specifically, for the 2011 NHS estimates, the global non-response rate (GNR) is used as an indicator of data quality. This indicator combines complete non-response (household) and partial non-response (question) into a single rate. The value of the GNR is presented to users. A smaller GNR indicates a lower risk of non-response bias and as a result, lower risk of inaccuracy. The threshold used for the estimates' suppression is a GNR of 50% or more. For the Kenpesq't main populated reserve, the GNR was 12.2% (Statistics Canada. 2016a).

Issues with relying on Census data to represent First Nation communities is that often 50% or more of the member Band population does not reside on the home reserves. In the case of the Kenpesq't, 85 members or 32% of the total population reside on Kenpesq't reserves. Finally, there will be a number of non-Band members residing on-reserve who will be included in the

Census and NHS data, the larger the non-Band resident presences the more difficult it can be to determine the population characteristics of the on-reserve Kenpesq't population.

f.38. Overview

The past location of the Shuswap Band is North of the current reserve communities. Teit describes the migration of Chief Kenpésket and his people, which had taken place about 65 years earlier (so approximately 1844): "[Chief Kenpésket] …who, with fifty or sixty friends, mostly members of the same division migrated to the head of the Columbia River, on the confines of the Kootenai tribe. Kenpésket and some of his followers had often been in that region on hunting-trips, and knew the country well. They made the trips mostly with canoes by way of Canoe River; and on arriving at their destination, they made an alliance with the Stony Indians of the Rocky Mountains." (Teit 1909:467). The alliance between the Kinbasket and the Stony has been described, and it is identified that the Kinbasket always did use the area they now inhabit, so this really was not a change in Territory, just utilization (LeBourdais 2009:13-14).

Today, Shuswap members who live on Shuswap reserves are located near the Columbia River near the communities of Invermere and Cranbrook. The Columbia is very important to Shuswap ways of life, one of the primary goals of the Kenpesq't is to see salmon return to the Upper Columbia. The Kenpesq't sees this return as fundamental to regaining their cultural-spiritual connection to the land.

The Kenpesq't's Traditional Use Study is currently under review by the Band members (Shuswap Indian Band 2008). In it, they characterize their history and culture as follows:

> *The Kenpesq't, or Shuswap Indian Band, is a member of the Secwépemc (Shuswap) Nation, an interior Salish speaking people who traditionally occupied a vast area in the south-central part of British Columbia, Canada … The traditional territory of the Shuswap Indian Band centres on the Upper Columbia Valley and mountain ranges but has no precise boundaries … (Shuswap Indian Band 2008:xv-xviii).*

Shuswap has partnerships with a number of business in the area (e.g. Akisqnuk First Nation ANKORS BC Hydro Canadian Mental Health Association, Canadian Mountain Holidays, Columbia Basin Trust, Corix, Dr. Michael Baker, Family Dynamix, First Nations Health Authority, Home Hardware, Interior Health, Invermere Royal Canadian Mounted Police, Ktunaxa Nation, Regional District of East Kootenay, Rising Sun Massage & Spa, Sobey's, Urban Systems) (Shuswap 2016). The Kinbasket Development Corporation generates income for the Kenpesq't through partnerships. Kenpesq't's CCP (May 2016) identifies tourism as an area for future economic growth (Shuswap Band and Urban Systems 2016:15). The CCP also outlines existing Secwepemc language initiatives and prioritizes future language revitalization efforts (Shuswap Band and Urban Systems 2016:18).

Shuswap I.R., in addition to the band office, is the location of the new health centre, which was opened in 2015. The centre provides medical services and additional health resources, such as the Healthy Food Box program. Participation in traditional Secwepemc lifeways, such as harvesting traditional foods and medicines, contribute to both the dietary health and positive mental health of the community, as identified throughout this report.

Kenpesq't is a member of the Shuswap Nation Tribal Council, and the Ktunaxa Kinbasket Tribal Council.

f.39. Kenpesq't Population

Kenpesq't has a registered population of 264 persons in November 2016. This number includes members living on- and off-reserve. Within this population: 85 members are living on Shuswap I.R. (on the Columbia River, slightly to the North of Invermere). In addition, there are 33 members living on non-Shuswap reserves, and 146 members living off-reserve.

Table 32: Kenpesq't Population By Residency, November 2016.

	Male	Female	Total
Registered On Own Reserve	45	40	85
Registered On Other Reserves	15	18	33
Registered Off Reserve	68	78	146
Total Registered Population	128	136	264

Source: IANAC. 2016.

f.40. Secwepemctsin Language

According to government statistics regarding knowledge of Indigenous languages among on-reserve Kenpesq't population, speaking Secwepemctsin may or may not be increasing. In 2011, 3.4% identified as speaking and Aboriginal language in the home, as compared to 0% in 2006; however, the percentage decreased regarding Aboriginal language first learned prior to another language (e.g. English), see **Table 33**.

Table 33: Language Statistics for Kenpesq't On-reserve, 2011

	Male	Female	Total
Language Knowledge	160	130	290
Aboriginal language(s)	10	10	20
Pop. with Aboriginal languages first learned (%)	6.3	0	3.4
Pop. with Aboriginal spoken at home (%)	0	0	3.4
Pop. with knowledge of Aboriginal lang. (%)	6.3	7.4	3.4

Source: IANAC. 2016

f.41. On-reserve Age Characteristics

Table 34 outlines the age characteristics for the on-reserve population (i.e., all persons living on Kenpesq't reserves, regardless of whether they are a band member or not) and compares the age categories to the larger East Kootenay Regional District. As highlighted, the on-reserve Kenpesq't population has a similar share of its population in the under 19-years of age category with that observed in the larger East Kootenay Regional District. The Kenpesq't on-reserve population has a slightly smaller percentage share in the over 65-year age category when compared to the larger Region. The median age of people living on Kenpesq't reserves (as of 2011) is 36.7 years-old (as compared to the median age of the East Kootenay Regional District of 44.5 years of age.

Table 34: Kenpesq't On-reserve Age Characteristics and Comparison with East Kootenay Regional District, 2011.

	Kenpesq't				East Kootenay
	Male	**Female**	**Total**	**% Share**	**% Share**
Age 0-19	45	25	70	23.7%	21.8%
Age 20-64	95	90	185	62.7%	61.6%
Age 65 and over	20	20	40	13.6%	16.6%
Total All persons	160	135	295	100.0%	100.0%
Median Age	33.1	39.6	36.7		44.5

Source: IANAC. 2016 and Statistics Canada. 2016b.

f.42. On-reserve Household Characteristics

Table 35 highlights the household characteristics of the on-reserve housing for the Kenpesq't. As illustrated, approximately 63% of households are couple families, this is higher than the larger East Kootenay Regional District.

Table 35: Kenpesq't On-reserve Household Characteristics and Comparison with East Kootenay Regional District, 2011.

	Kenpesq't		East Kootenay
	#	**% Share**	**% Share**
Total - All private households	120	100.0%	100.0%
One family households	80		
Couple family households	75	62.5%	60.1%
Female lone parent households	10	8.3%	6.6%
Male lone parent households	0	0.0%	2.3%
Multi-family households	0	0.0%	1.0%
Non-family households	35	29.2%	30.0%

	Kenpesq't		East Kootenay
	#	% Share	% Share
Median household income ($)	47,902		$66,049

Source: IANAC. 2016 and Statistics Canada. 2016b.

Kenpesq't median household income was $47,902 in 2011; this was below the larger East Kootenay Region that had a median household income of $66,049.

f.43. On-reserve Education Attainment

Of the 295 residents (including Kenpesq't members and other residents) living on-reserve in 2011, 240 were over 15 years of age (i.e. employable). Table 36 summarizes the educational attainment of these residents and highlights the high number of both males and females who have obtained trades and apprenticeships or other non-university certificates.

Table 36: Kenpesq't On-Reserve Education Attainment Comparison to the East Kootenay Regional District, 2011.

	Kenpesq't				East Kootenay RD
	Male	Female	Total	% Share of Total	% Share of Total
No degree, certificate or diploma	45	20	65	27.1%	18.6%
High school diploma or equivalent only	35	45	80	33.3%	28.0%
Trades/apprenticeship or other non-university certificate	35	30	65	27.1%	15.8%
University certificate below bachelor level	0	10	10	4.2%	23.8%
University degree (bachelor level or higher)	10	10	20	8.3%	13.9%
Population 15 years and over	125	115	240	100.0%	100.0%

Source: IANAC. 2016 and Statistics Canada. 2016b.

f.44. On-reserved Experienced Labour Force

Table 37 outlines the percentage shares of the on-reserve Kenpesq't experienced labour force and compares these percentage shares with the larger East Kootenay Regional District. As illustrated, there is a large share of Kenpesq't on-reserve experienced labour force in wholesale and retail, and manufacturing and construction.

Table 37: Kenpesq't On-reserve Experienced Labour Force and Comparison to East Kootenay Regional District, 2011.

	Kenpesq't	East Kootenay RD
Population 15 years and over	240	30,675
Agriculture, resource based	5.6%	13.8%
Manufacturing, construction	16.7%	14.3%

	Kenpesq't	East Kootenay RD
Wholesale, retail	11.1%	14.7%
Finance, real estate	5.6%	5.6%
Health, education	8.3%	16.8%
Business services	11.1%	8.8%
Transportation, warehousing	5.6%	3.8%
Other services	36.1%	22.2%
Total	100.0%	100.0%

Source: IANAC. 2016 and Statistics Canada. 2016b.

Unfortunately, the low reliability of the National Household Survey in 2011 has resulted in Statistics Canada allocating a large portion of the labour force to other services, which includes a wide range of activities including, arts, entertainment and recreation; public administration; and, accommodation and food services.

f.45. On-reserve Labour Force Participation

The 2011 census data for the Kenpesq't reserve populations shows that just over 9% of the employable population is unemployed. This is only slightly higher than the rate at the larger East Kootenay Regional District level.

Table 38: Kenpesq't On-reserve Labour Force Participation and Comparison to Thompson Nicola Regional District, 2011.

	Kenpesq't			East Kootenay RD		
	Male	**Female**	**Total**	**Male**	**Female**	**Total**
Participation rate	72.0%	60.9%	68.8%	71.8%	59.8%	65.8%
Employment rate	68.0%	56.5%	62.5%	66.3%	56.0%	61.2%
Unemployment rate	n/a	n/a	9.1%	7.8%	6.3%	7.1%

Source: IANAC. 2016 and Statistics Canada. 2016b.

Sqw'lax [Little Shuswap Lake]

f.46. Data Quality

Much of the data used in this section is referenced from the Indigenous and Northern Affairs Canada First Nation Profiles and is derived from Statistics Canada data sources. The Statistics Canada Census data can be challenged in accurately when representing smaller population. In addition, there have been challenges in obtaining accurate numbers for First Nation community over past Census periods.

Furthermore, a unique challenge emerged for the 2011 Census when the Federal Government abandoned the long-form Census and replaced it with the National Household Survey (NHS). Given the low response rate, this creates challenges for the accuracy of data such as education, experienced labour force, labour force participation, and personal and household income data for communities with smaller populations.

Specifically, for the 2011 NHS estimates, the global non-response rate (GNR) is used as an indicator of data quality. This indicator combines complete non-response (household) and partial non-response (question) into a single rate. The value of the GNR is presented to users. A smaller GNR indicates a lower risk of non-response bias and as a result, lower risk of inaccuracy. The threshold used for the estimates' suppression is a GNR of 50% or more. For the Skw'lax main populated reserve, the GNR was 34.4% (Statistics Canada. 2016a).

Issues with relying on Census data to represent First Nation communities is that often 50% or more of the member Band population does not reside on the home reserves. In the case of the Skw'lax, 85 members or 34.4% of the total population reside on Skw'lax reserves. Finally, there will be a number of non-Band members residing on-reserve who will be included in the Census and NHS data. The larger the non-Band resident presences the more difficult it can be to determine the population characteristics of the on-reserve Skw'lax population.

f.47. Overview

The members of Skw'lax who are living on-reserve, live near Shuswap Lake and Little Shuswap Lake, near the South Thompson River, with additional reserves in proximity to Chum and Philips Lakes.

On their website, Skw'lax describes themselves this way:

> *To the people of the Little Shuswap it's known at Skw'lax. The settlers could not say the Shuswap name so it is known today as Squilax. Skw'lax in the Shuswap language is known as black bear.*
>
> *Whether you are travelling through on vacation or planning to stay with us awhile, we know you will agree that truly we have the "Land of the Great Spirit." From the snow-capped mountains to the panoramic view of the Shuswap Lake, the natural scenic wonders will leave you breathless and yearning to return once more.*
>
> *A limited amount of hunting on the reservation has preserved the abundance of wildlife in their pristine environment. Campgrounds amid the pines are easily reached, minutes from the main highways. Most of the recreational areas are especially scenic with excellent fishing close at hand. The flora and fauna of the Little Shuswap are a photographer's dream.*
>
> *With all that we have to offer, we ask that you come... come visit us... come stay with us... all that we ask is that you treat the land and the people with respect. This is our home for the short time that we are here on Mother Earth, but it is the home of the great spirit for eternity.*

Currently, Skw'lax has various commercial ventures, which contribute to the economy. In addition to leasing opportunities, the community operates Skw'lax Centre (which includes a gas station in close proximity to Little Shuswap Lake for car and boat fueling), Skw'lax Air Strip (which allows helicopter landing), and Quaaout Lodge and Spa which also features Talking Rock Golf Course on the same property (Little Shuswap Lake Indian Band 2016). The lodge and golf course attract international clientele to the area. The lodge is situated on Quaaout I.R. 1. Signage and examples, explaining traditional Secwepemc subsistence and ceremonial practices, are featured around the property in order to educate visitors.

Daily tours are also offered to explain the cultural practices illustrated on around the lodge and golf resort (Quaaout Lodge 2016). In 2015 Skw'lax completed a comprehensive community plan which encourages economic development as a means to increase the self-sufficiency of the Skw'lax community (Urban Systems 2015:17).

The community plan also highlights cultural concerns, such as keeping the Secwepemctsin language strong (Urban Systems 2015:8). In 1987 concerned parents from Skw'lax, along with Sexqeltqin and Neskonlith Bands worked together to start the language revitalization program which lead to the creation the Secwepemctsin immersion school in 1991 on an Adams Lake Indian Band reserve (T'selcéwtqen Clleqmél'ten, Chief Atahm School website 2016).

Quaaout I.R. 1 is situated on Little Shuswap Lake and is a hub for tourism initiatives. Additionally, a number of community buildings, including Skw'lax Daycare and the Skw'lax Wellness Centre, are located there. The Wellness Centre meets community needs for medical health as well as employment services and social development support (such as activities for different age demographics e.g. children's summer camps and programming), (Little Shuswap Lake Indian Band 2016). North Bay I.R. 5 is also the location of a community hall, known locally as Tappen Hall.

Participation in traditional Secwepemc lifeways, such as harvesting traditional foods and medicines, contribute both to the dietary health and positive mental health of the community, as identified throughout this report.

Skw'lax is not a member of the Shuswap Nation Tribal Council.

f.48. Skw'lax Population

Skw'lax has a registered population of 349 in November 2016. Within this population: 196 members are living on-reserve on four of the Little Shuswap Lake's five reserves (Urban Systems 2015:22) including:

- Chum Creek I.R. 2 (on the south side of the South Thompson River at the end of Little Shuswap Lake);
- Meadow Creek I.R. 3 (slightly to the east of Chum Lake and slightly north of Phillips Lake);
- North Bay I.R. 5 (on the north shore of Salmon Arm on Shuswap Lake;
- The most popular reserve, Quaaout I.R. 1 (between Shuswap and Little Shuswap Lakes on the north side of the South Thompson River); and,

- Scotch Creek I.R. 4 (on the North Shore of Shuswap Lake), North of Scotch Creek.

In addition, there are 41 members living on non- Little Shuswap Lake reserves, and 112 members living off-reserve. The median age of people living on Skw'lax reserves (as of 2011) is 43.7 years old (as compared to the median age of the British Columbia population as a whole which is 41.6 years old.

Table 39: Skw'lax Population By Residency, November 2016.

	Male	Female	Total
Registered On Own Reserve	107	89	196
Registered On Other Reserves	22	19	41
Registered Off Reserve	61	51	112
Total Registered Population	190	159	349

Source: IANAC. 2016

f.49. Secwepemctsín Language

With ongoing community interest to learn Secwepemctsin, knowledge of the language may be increasing. In the other communities discussed in this report, where statistics are available for the 2006 and 2011 census reports, there has been an increase in knowledge of the Indigenous language on some reserves, whereas in other communities there has been a decrease. Statistics are not available for Little Shuswap Lake reserves from the 2006 census, so it is not known whether knowledge of the language is increasing, see the below 2011 statistics.

Table 40: Language Statistics for Skw'lax On-reserve, 2011

	Male	Female	Total
Language Knowledge	190	160	360
Aboriginal language(s)	35	30	65
Pop. with Aboriginal languages first learned (%)	5.3	6.3	6.9
Pop. with Aboriginal spoken at home (%)	15.8	12.5	13.9
Pop. with knowledge of Aboriginal lang. (%)	21.1	18.0	18.1

Source: IANAC. 2016

f.50. On-reserve Age Characteristics

Table 41 outlines the age characteristics for the on-reserve population (i.e., all persons living on Skw'lax reserves, regardless of whether they are a band member or not) and compares the age categories to the larger Thompson Nicola Regional District. As highlighted, the on-reserve Skw'lax population has a similar larger share of its population in the under 19-years of age category than observed in the Thompson Nicola Regional District. Skw'lax reserve population is

the only reserve to have a larger share of its population over the age of 65 years than in the larger Region.

Table 41: Skw'lax On-reserve Age Characteristics and Comparison with Thompson Nicola Regional District, 2011.

	Skw'lax				Thompson Nicola RD
	Male	**Female**	**Total**	**% Share**	**% Share**
Age 0-19	60	45	105	29.2%	21.7%
Age 20-64	100	90	190	52.8%	61.3%
Age 65 and over	35	30	65	18.1%	17.0%
Total All persons	195	165	360	100.0%	100.0 %
Median Age	43.3	43.9	43.7		44.0

Source: IANAC. 2016 and Statistics Canada. 2016b.

f.51. On-reserve Household Characteristics

Table 42 highlights the household characteristics of the on-reserve housing for the Skw'lax. As illustrated, approximately 43% of households are couple families, this is a lower share than the larger Thompson Nicola Regional District. In addition, the Skw'lax has a larger share of lone-parent families when compared to the Thompson Nicola Regional District.

Table 42: Skw'lax On-reserve Household Characteristics and Comparison with Thompson Nicola Regional District, 2011.

	Skw'lax		Thomspon Nicola RD
	#	**% Share**	**% Share**
Total - All private households	150	100.0%	100.0%
One family households	90		
Couple family households	65	43.3%	54.6%
Female lone parent households	20	13.3%	8.8%
Male lone parent households	10	6.7%	2.7%
Multi-family households	0	0.0%	1.8%
Non-family households	55	36.7%	32.1%
Median household income ($)	38,725		59,385

Source: IANAC. 2016 and Statistics Canada. 2016b.

Skw'lax median household income was $38,725 in 2011; this is noticeably lower than the $59,385 observed at the larger Thompson Nicola Region.

f.52. On-reserve Education Attainment

Of the 295 residents (including Skw'lax members and other residents) living on-reserve in 2011, 240 were over 15 years of age (i.e. employable). Table 44 summarizes the educational attainment of these residents and highlights the high number of both males and females who have obtained trades and apprenticeships or other non-university certificates. Skw'lax on-reserve population has a share that is twice the level observed at the larger Thompson Nicola Regional District.

Table 43: Skw'lax On-Reserve Education Attainment Comparison to the Thompson Nicola Regional District, 2011.

	Skw'lax				Thompson Nicola RD
	Male	**Female**	**Total**	**% Share of Total**	**% Share of Total**
No degree, certificate or diploma	60	30	90	31.6%	19.8%
High school diploma or equivalent only	35	45	80	28.1%	30.4%
Trades/apprenticeship or other non-university certificate	50	40	90	31.6%	14.1%
University certificate below bachelor level	5	10	15	5.3%	21.7%
University degree (bachelor level or higher)	10	0	10	3.5%	14.1%
Population 15 years and over	160	125	285	100.0%	100.0%

Source: IANAC. 2016 and Statistics Canada. 2016b.

f.53. On-reserved Experienced Labour Force

Table 44 outlines the percentage shares of the on-reserve Skw'lax experienced labour force and compares these percentage shares with the larger Thompson Nicola Regional District. As illustrated, there is a large share of the experienced labour force in manufacturing and construction.

Table 44: Skw'lax On-reserve Experienced Labour Force and Comparison to Thompson Nicola Regional District, 2011.

	Skw'lax	Thompson Nicola RD
Population 15 years and over	285	67,415
Agriculture, resource based	6.3%	8.9%
Manufacturing, construction	9.4%	14.0%
Wholesale, retail	6.3%	16.2%
Finance, real estate	6.3%	4.2%
Health, education	6.3%	20.3%
Business services	0.0%	8.7%

Transportation, warehousing	6.3%	6.1%
Other services	59.4%	21.6%
Total	100.0%	100.0%

Source: IANAC. 2016 and Statistics Canada. 2016b.

Unfortunately, the low reliability of the National Household Survey in 2011 has resulted in Statistics Canada allocating a large portion of the labour force to other services, which includes a wide range of activities including, arts, entertainment and recreation; public administration; and, accommodation and food services.

f.54. On-reserve Labour Force Participation

The 2011 census data for the Skw'lax reserve populations shows that 17.9% of the employable population is unemployed, as shown in **Table 45**. This is higher than the rate at the larger Thompson Nicola Regional District level.

Table 45: Skw'lax On-reserve Labour Force Participation and Comparison to Thompson Nicola Regional District, 2011.

	Male	**Female**	**Total**	**Male**	**Female**	**Total**
Participation rate	50.0%	48.0%	9.1%	66.5%	60.4%	63.4%
Employment rate	40.6%	36.0%	0.4%	59.5%	55.3%	57.3%
Unemployment rate	12.5%	25.0%	7.9%	10.5%	8.6%	9.6%

Source: IANAC. 2016 and Statistics Canada. 2016b.

Aboriginal Population in the Shuswap Area

f.55. Study Area Overview

As mentioned above, a large share of First Nations membership resides off reserve. It is believed that many live in the larger regions surrounding their reserve lands. The following uses Statistic Canada data to gain insight into the socio-economic characteristics of those identifying themselves as aboriginal in the 2011 Census. It is unknown what share of those identifying themselves of aboriginal ancestry are Secwepemc.

The Shuswap Area is made up of Columbia Shuswap Regional District (CSRD) Electoral Areas, B, C, D, E, F and the municipalities of Revelstoke, Sicamous, Salmon Arm, and Chase.

f.56. Aboriginal Identity in Shuswap Area

Table 46 highlights the Aboriginal identity in the Shuswap Area. As illustrated, 1,750 or 47% of the Aboriginal, population identifies themselves as First Nations.

Table 46: Aboriginal Identity in Shuswap Area, 2011

	#
First Nations (North American Indian) single identity	1,750
Métis single identity	1,815
Inuk (Inuit) single identity	50
Multiple Aboriginal identities	0
Aboriginal identities not included elsewhere	75
Total Aboriginal identity	**3,690**

Source: Statistics Canada. 2016d.

f.57. Shuswap Area Age Characteristics

Table 47 outlines the age characteristics for the First Nations population off-reserve in the Shuswap Area and compares the age categories to the larger CSRD. As highlighted, the off-reserve First Nation population is younger than the larger Region with the median age being 30.5 years compared to 48.1 in the CSRD.

Table 47: Aboriginal Age Characteristics and Comparison with Columbia Shuswap Regional District, 2011.

	Shuswap Area		**Columbia-Shuswap RD**
	Total	**% Share**	**% Share**
Age 0-19	1,445	39.2%	20.0%
Age 20-64	1,995	54.0%	59.2%
Age 65 and over	250	6.8%	20.8%
Total All persons	3,690	100.0%	100.0%
Median Age		30.5	48.1

Source: Statistics Canada. 2016c and Statistics Canada. 2016b.

f.58. Shuswap Area Education Attainment

Of the aboriginal residents in 2011, 3,690 were over 15 years of age (i.e. employable). **Table 48** summarizes the educational attainment of these residents and highlights the high number of Aboriginal residents who have obtained trades and apprenticeships or other non-university certificates when compared to the larger CSRD.

Table 48: Aboriginal Education Attainment Comparison to the Columbia-Shuswap Regional District, 2011.

	Shuswap Area	**Columbia-Shuswap RD**	
	Total	**% Share of Total**	**% Share of Total**
No degree, certificate or diploma	880	33.2%	19.9%
High school diploma or equivalent only	825	31.1%	28.9%
Trades/apprenticeship or other non-university	755	28.5%	16.4%

	Shuswap Area	Columbia-Shuswap RD	
	Total	% Share of Total	% Share of Total
certificate			
University certificate below bachelor level	95	3.6%	22.8%
University degree (bachelor level or higher)	95	3.6%	12.0%
Population 15 years and over	2,650	100.0%	100.0%

Source: Statistics Canada. 2016d and Statistics Canada. 2016b.

f.59. Shuswap Area Experienced Labour Force

Table 49 outlines the population identified as Aboriginal and the percentage shares of the experienced labour force and compares this with the larger CSRD. Overall, in the Shuswap Area almost 23% of the experienced labour force that identify themselves as Aboriginal are employed in manufacturing and construction.

Table 49: Aboriginal Experienced Labour Force and Comparison to Columbia-Shuswap Regional District, 2011.

	Shuswap Area	Columbia-Shuswap RD
Population 15 years and over	1,570	24,890
Agriculture, resource based	4.5%	9.2%
Manufacturing, construction	22.6%	18.5%
Wholesale, retail	22.6%	13.2%
Finance, real estate	0.0%	5.0%
Health, education	15.3%	17.6%
Business services	5.4%	8.1%
Transportation, warehousing	6.1%	6.9%
Other services	23.6%	21.4%
Total	100.0%	100.0%

Source: Statistics Canada. 2016d and Statistics Canada. 2016b.

f.60. Shuswap Area Labour Force Participation

The 2011 census data for the Shuswap Area Aboriginal populations shows that unemployment was noticeably higher than at the larger CSRD level.

Table 50: Aboriginal Labour Force Participation and Comparison to Columbia-Shuswap Regional District, 2011.

	Shuswap Area			Columbia-Shuswap RD		
	Male	Female	Total	Male	Female	Total
Participation rate	68.5%	57.1%	%[illegible]	62.7%	54.6%	58.6%
Employment rate	52.9%	49.8%	%[illegible]	55.2%	48.5%	51.8%

Unemployment rate	22.7%	13.5%	3%	12.0%	11.3%	11.6%

Source: Statistics Canada. 2016d and Statistics Canada. 2016c.

Aboriginal Population in the Invermere Area

f.61. Study Area Overview

As mentioned above, a large share of First Nations membership resides off reserve. It is believed that many live in the larger regions surrounding their reserve lands. The following uses Statistic Canada data to gain insight into the socio-economic characteristics of those identifying themselves as aboriginal in the 2011 Census. It is unknown what share of those identifying themselves of aboriginal ancestry are Secwepemc.

The Invermere Area is made up of East Kootenay Regional District Electoral Area G and F, and the municipalities of Radium and Invermere.

f.62. Aboriginal Identity in Invermere Area

Table 51 highlights the Aboriginal identity in the Invermere Area. As illustrated, 75 or 17% of the Aboriginal population identifies themselves as First Nations.

Table 51: Aboriginal Identity in Invermere Area, 2011

	#
First Nations (North American Indian) single identity	75
Métis single identity	310
Inuk (Inuit) single identity	0
Multiple Aboriginal identities	0
Aboriginal identities not included elsewhere	65
Total Aboriginal identity	**450**

Source: Statistics Canada. 2016d

f.63. Invermere Area Age Characteristics

Table 52 outlines the age characteristics for the First Nations population off-reserve in the Invermere Area and compares the age categories to the larger East Kootenay Regional District. As highlighted, the off-reserve First Nations population is slightly younger than the larger Region with the median age being 44.1 compared to 44.5 in the East Kootenay Regional District.

Table 52: Aboriginal Age Characteristics and Comparison with East Kootenay Regional District, 2011.

	Invermere Area		**East Kootenay**
	Total	**% Share**	**% Share**
Age 0-19	135	29.7%	21.8%
Age 20-64	315	70.3%	61.6%
Age 65 and over	0	0.0%	16.6%

	Invermere Area		East Kootenay
	Total	% Share	% Share
Total All persons	450	100.0%	100.0%
Median Age		44.1	44.5

Source: Statistics Canada. 2016c and Statistics Canada. 2016b.

f.64. Invermere Area Education Attainment

Of the aboriginal residents in 2011, 395 were over 15 years of age (i.e. employable). **Table 53** summarizes the educational attainment of these residents and highlights the high numbers who have obtained trades and apprenticeships or other non-university certificates.

Table 53: Aboriginal Education Attainment Comparison to the East Kootenay Regional District, 2011.

	Invermere Area		East Kootenay RD
	Total	% Share of Total	% Share of Total
No degree, certificate or diploma	130	32.9%	18.6%
High school diploma or equivalent only	120	30.4%	28.0%
Trades/apprenticeship or other non-university certificate	115	29.1%	15.8%
University certificate below bachelor level	5	1.3%	23.8%
University degree (bachelor level or higher)	25	6.3%	13.9%
Population 15 years and over	395	100.0%	100.0%

Source: Statistics Canada. 2016d and Statistics Canada. 2016b.

f.65. Invermere Experienced Labour Force

Table 54**Table 49** outlines the population identified as Aboriginal and the percentage shares of the experienced labour force and compares this with the larger East Kootenay Regional District. Overall, in the Invermere Area almost 35% of the experienced labour force that identify themselves as Aboriginal are employed in manufacturing and construction.

Table 54: Aboriginal Experienced Labour Force and Comparison to East Kootenay Regional District, 2011.

	Invermere Area	East Kootenay RD
Population 15 years and over	285	30,675
Agriculture, resource based	0.0%	13.8%
Manufacturing, construction	34.5%	14.3%
Wholesale, retail	13.8%	14.7%
Finance, real estate	0.0%	5.6%

	Invermere Area	East Kootenay RD
Health, education	20.7%	16.8%
Business services	0.0%	8.8%
Transportation, warehousing	0.0%	3.8%
Other services	31.0%	22.2%
Total	100.0%	100.0%

Source: Statistics Canada. 2016d and Statistics Canada. 2016b.

f.66. Invermere Area Labour Force Participation

The 2011 census data for the Invermere Area Aboriginal populations shows that participation and the employment rate is noticeably higher than the rate at the larger East Kootenay Regional District level. See **Table 55**.

Table 55: Aboriginal Labour Force Participation and Comparison to East Kootenay Regional District, 2011.

	Invermere Area			East Kootenay RD		
	Male	**Female**	**Total**	**Male**	**Female**	**Total**
Participation rate	90.0%	61.2%	72.2%	71.8%	59.8%	65.8%
Employment rate	90.0%	63.3%	72.2%	66.3%	56.0%	61.2%
Unemployment rate	0%	0%	0%	7.8%	6.3%	7.1%

Source: Statistics Canada. 2016d and Statistics Canada. 2016b.

Aboriginal Population in the North Thompson Area

f.67. Study Area Overview

A large share of First Nations membership resides off reserve. It is believed that many live in the larger regions surrounding their reserve lands. The following uses Statistic Canada data to gain insight into the socio-economic characteristics of those identifying themselves as aboriginal in the 2011 Census. It is unknown what share of those identifying themselves of aboriginal ancestry are Secwepemc.

The North Thompson Area consists of Thompson Nicola Regional District Electoral Areas A, B, and O, and the municipalities of Barriere and Clearwater. Kamloops has been excluded because of the high number of Aboriginals from many other communities that would skew the results.

f.68. Aboriginal Identity in the North Thompson Area

Table 56 highlights the Aboriginal identity in the North Thompson Area. As illustrated, 345 or 67% of the Aboriginal population identifies themselves as First Nations.

Table 56: Aboriginal Identity in the North Thompson Area, 2011

	#
First Nations (North American Indian) single identity	345
Métis single identity	160
Inuk (Inuit) single identity	0
Multiple Aboriginal identities	0
Aboriginal identities not included elsewhere	10
Aboriginal identity	**515**

Source: Statistics Canada. 2016d

f.69. North Thompson Area Age Characteristics

Table 57 outlines the age characteristics for the First Nations population off-reserve in the North Thompson Area and compares the age categories to the larger Thompson Nicola Regional District. As highlighted, the off-reserve First Nations population is slightly younger than the larger Region with the median age being 43.0 compared to 44.0 in the Thompson Nicola Regional District.

Table 57: Aboriginal Age Characteristics and Comparison with Thompson Nicola Regional District, 2011.

	North Thompson Area		**Thompson Nicola RD**
	Total	**% Share**	**% Share**
Age 0-19	225	43.4%	21.7%
Age 20-64	260	50.6%	61.3%
Age 65 and over	30	6.0%	17.0%
Total All persons	515		100.0%
Median Age		43.0	44.0

Source: Statistics Canada. 2016c and Statistics Canada. 2016b.

f.70. Shuswap Area Education Attainment

Of the aboriginal residents in 2011, 425 were over 15 years of age (i.e. employable). **Table 58** summarizes the educational attainment of these residents and highlights the high numbers who have obtained trades and apprenticeships or other non-university certificates.

Table 58: Aboriginal Education Attainment Comparison to the Thompson Nicola Regional District, 2011.

	North Thompson Area		Thompson Nicola RD
No degree, certificate or diploma	110	25.9%	19.8%
High school diploma or equivalent only	155	36.5%	30.4%
Trades/apprenticeship or other non-university certificate	115	27.1%	14.1%
University certificate below bachelor level	0	0.0%	21.7%
University degree (bachelor level or higher)	45	10.6%	14.1%
Population 15 years and over	425	100.0%	100.0%

Source: Statistics Canada. 2016d and Statistics Canada. 2016b.

f.71. North Thompson Experienced Labour Force

Table 59 outlines the population identified as Aboriginal and the percentage shares of the experienced labour force and compares this with the larger Thompson Nicola Regional District. Overall, in the North Thompson Area almost 50% of the experienced labour force that identify themselves as Aboriginal are employed in agriculture, forestry, mining and other resource based activities.

Table 59: Aboriginal Experienced Labour Force and Comparison to East Kootenay Regional District, 2011.

	North Thompson Area	Thompson Nicola RD
Population 15 years and over	250	67,415
Agriculture, resource based	50.0%	8.9%
Manufacturing, construction	25.0%	14.0%
Wholesale, retail	0.0%	16.2%
Finance, real estate	0.0%	4.2%
Health, education	0.0%	20.3%
Business services	0.0%	8.7%
Transportation, warehousing	0.0%	6.1%
Other services	25.0%	21.6%
Total	100.0%	100.0%

Source: Statistics Canada. 2016d and Statistics Canada. 2016b.

f.72. North Thompson Area Labour Force Participation

The 2011 census data for the North Thompson Area Aboriginal populations shows that unemployment rate is noticeably higher than the rate at the larger Thompson Nicola Regional District level. See Table 60.

Table 60: Aboriginal Labour Force Participation and Comparison to Thompson Nicola Regional District, 2011.

	North Thompson Area			Thompson Nicola RD		
	Male	**Female**	**Total**	**Male**	**Female**	**Total**
Participation rate	55.0%	69.6%	64.7%	66.5%	60.4%	63.4%
Employment rate	45.0%	54.3%	49.4%	59.5%	55.3%	57.3%
Unemployment rate	27.3%	21.9%	23.6%	10.5%	8.6%	9.6%

Source: Statistics Canada. 2016d and Statistics Canada. 2016b.

G. DESCRIPTION OF POTENTIAL ADVERSE EFFECTS OF THE PROPOSED PROJECT ON SECWEPEMC TITLE & RIGHTS

Secwepemc worldview encompasses a holistic approach to the air, land, water, plants, and all living creatures that occur within Secwepemcúlecw (Secwepemc territory). This ecosystem-based approach is applied towards all resource management projects with the aim to conserve and protect a healthy and viable environment for all those who currently and will in the future rely on it.

While there is extensive Secwepemc knowledge and usage of the Upper Columbia River valley, the TU data included in this report was recorded in studies that were not specific to the LSA and is likely an underrepresentation of the actual TU information within the LSA. Also, based on our understanding of the proposed project, there remain a number of gaps in the understanding of project-related impacts on cultural and natural resources, and thus Secwepemc Title & Rights. The results and conclusions presented in Part B of this Environmental Assessment application are largely uncertain given these gaps, which presents a higher risk to natural resources and greater impact to Secwepemc Title & Rights.

Scientific uncertainty and information gaps have been identified as part of this process, a precautionary approach to effects determination is required in order to acknowledge existing limits of change, which have already been exceeded, and to prevent further adverse impacts to Secwepemc values. Secwepemc concerns on the approach, methods, and results presented in Part B have been outlined in four letters provided to BC Hydro[22] (refer to Appendix G). In general, these concerns demonstrate the need for a more comprehensive understanding of the cumulative

[22] Splatsin Comments on DAIR, Valued Components, and Baseline References, dated April 26, 2016; Rev 6 Baseline and Methodology Draft Report, dated March 24, 2016; Secwepemc Review and Response to Revelstoke Unit 6 Part B (Draft) Report, dated October 26, 2016;

impacts of BC Hydro infrastructure and operations on cultural and natural resources, as well as Secwepemc Title & Rights. The key concerns are further discussed below, specific to each of the previously identified traditional use value categories.

Loss of Fishing Areas and Opportunities

Water is a sacred component to the Secwepemc culture and worldview and is considered the essence of all life. Aquatic resources that are currently supported within the Upper Columbia watershed rely on the quality and quantity of water moving through this system. Secwepemc TU data reviewed for this study has identified key species including kickinee (kokanee), sturgeon, trout, Dolly Varden (now known to be bull trout), carp, whitefish, ling cod and salmon fishing in the area. Salmon historically were very important food resources for Secwepemc communities in the Upper Columbia system, but have been extirpated from the Upper Columbia for over 7 decades as a result of the development of dam and hydro facilities. Sturgeon are no longer harvested due to their endangered population status.

As acknowledged within Part B, Section 4.2 of this EA application, there are numerous challenges associated with studying the effects and responses of dam-related activities on fish and fish habitat within large river and reservoir environments. The need to fill gaps in information, such as recent kokanee population data, fish habitat/suitability changes in the Middle Columbia River, impacts on fish passage, impacts of fish entrainment at the population level, impacts on genetic diversity and population viability, impacts of changes of the thermal regime on productivity, community structure and food-web dynamics as a result of changing velocities and thermal regimes, remain a concern of the Secwepemc Nation.

With these information gaps in mind, the existing body of research and monitoring programs are showing that changes are occurring and that these changes are influencing fish population abundance and structure. Although complex interactions among dam operations as well as natural regime and their effects on productivity require further investigation, studies conducted to date show the Columbia River is negatively impacted. The effects of existing hydro activities in the Upper Columbia River Valley has an adverse and ongoing effect on Secwepemc people's fishing areas and opportunities as fishing pressure has increased for less abundant and varied food resources, and the health and quantity of the aquatic ecosystem has been compromised. Options for mitigation measures need to be investigated and applied accordingly with an adaptive management approach.

Loss of Hunting Areas and Opportunities

Key species that have been hunted and trapped by Secwepemc peoples in the Upper Columbia River valley include goat, caribou, deer, bighorn sheep, elk, bear, beaver, marmot, grouse, ptarmigan, and waterfowl. As with salmon and sturgeon, caribou are no longer harvested by the Secwepemc people because of this species' endangered population status. Caribou hunting is described in the oral history of all of Eastern Secwepemc communities. Areas used for meat drying areas and wildlife habitat features such as salt licks are also important areas associated with hunting opportunities.

Loss of habitat (e.g. via inundation or erosion), has been identified as the primary driver in species impacts in the project area (Utzig and Schmidt 2011). Changes in seasonal migration patterns, habitat connectivity, genetic exchanges, predator/prey dynamics, reproductive success and dispersal are all potential outcomes of habitat fragmentation. General habitat types that have been inundated and disconnected from other suitable habitat include older interior rainforests and lowland aquatic features (e.g., wetlands). Historically, the inundated area likely contributed to loss in old-growth ICH forest, as mentioned, that would have provided high suitability winter habitat to red-listed Mountain Caribou (Serrouya et al. 2007) as well as potentially blue-listed Fisher habitat (maternal dens in riparian forest) (www.cnrc.com/sar).

While this environmental assessment application uses the baseline condition of Revelstoke 5 to predict the effects of change as a result of the project, much of the baseline information surrounding the wildlife valued component remains uncertain and therefore represents a higher risk to wildlife and Secwepemc hunting opportunities. For example, additional field survey efforts are required to determine potential mammal species presence and habitat use in support of the reconnaissance level efforts that took place in 2008. These surveys should occur across a range of seasons to capture the various seasonal habitat requirements of local and regional species. Other information gaps related to potential project impacts on wildlife species include information for species at risk such as red-listed badger and grizzly bear. Also, reliance on data sets that have only partial coverage of the total area impacted and/or limited species groups results in considerable uncertainties and gaps in understanding the effects of Revelstoke 6 project on wildlife such as bird species.

The concepts of ecological and cultural thresholds need to be considered in this assessment. These impacts are not captured in the current process which focuses on the incremental potential effects of the project based on our current understanding of the existing condition following the Revelstoke 5 project.

Species specific management plans need to be developed to prevent adverse effects on local wildlife species (e.g. mountain goat, migratory birds) and to demonstrate that these species have been appropriately considered in order to avoid potential effects such as abandonment of important natal habitat, mortality or displacement.

Loss of Plant Harvesting Areas and Opportunities

Plants and plant harvesting activities identified in the TU information include various berries (e.g., saskatoon, black huckleberry, blueberry, raspberry, strawberry, black caps, red currant, gooseberry), other food plants (e.g., choke cherry, Indian potatoes (skwnwinm), wild rice, mushrooms, fiddleheads, rosehips), and other plan harvesting activities (e.g., firewood gathering, food preservation areas, birch bark and cedar root collecting areas). As there has not been a specific study of TU within the LSA and considerable terrestrial lands have been lost to inundation due to the existing hydro reservoir system, it is assumed that a number of plant harvesting areas and opportunities have likely already been affected or lost.

Areas that experience regular disturbance (e.g., drawdown zone), are prone to colonization by noxious weed plant species. The extent of noxious weed establishment in the project area and

from Revelstoke 5 remains unknown. Other information that is poorly understood includes the distribution and abundance of rare plants in the LSA. As the target species are typically difficult to locate, a greater amount of survey effort is required to appropriately determine potential presence in the LSA. Survey timing is also very particular to the prescribed growing season of the rare plants that have potential to grow in the LSA. These uncertainties point to the unknown level of effects that the baseline condition and the project will have on Secwepemc people's ability to harvest plants.

What is certain is that further alteration of the hydrological regime and increased flow velocities due to the Revelstoke 6 project will promote further erosion of upland and riparian areas, which will result in further loss of vegetation and thus impacts on Secwepemc access and opportunity for plant harvesting. The extent of these losses is unknown given the uncertainties associated with the approach and conclusions presented in Part B; however, it is important to note again that the current landscape has been dramatically altered and impacted so any further disturbances must be considered significant.

Loss of Medicine Gathering Sites and Opportunities

Medicines, perhaps more so than any other collected food or material resource, reflect contemporary interests in the cultural and spiritual identities of Indigenous peoples. Places that community members have gone to and continue to frequent for healing and physical health (e.g. hot springs, medicinal plant gathering areas), contribute to the on-going wellbeing of individuals and communities as a whole.

Within Part B of this Environmental Assessment application, many questions remain about the level of impact that the project will have on medicine gathering sites and opportunities. Identification and quantification of medicinal gathering sites presents challenges as much of this information remains confidential in order to protect the location of important medicinal areas. With this in mind, additional field efforts need to be made within the project area to update noxious weed information and rare plant information within prescribed growing seasons (early to mid-growing season), as well as known medicinal gathering areas within the LSA. As a site specific TU study in the LSA has not been conducted, it should be assumed that this information has not been adequately captured through other research.

Medicinal gathering areas and opportunities have also likely been impacted by historical reservoir operations, and have not undergone project specific TU studies. As such, baseline information needs to take into account the true baseline of the vegetation communities that existed prior to the initial construction of the Project. Current gaps in project information require many assumptions to be made regarding project environmental impacts that in turn inform the determination of effects. This presents an unacceptable risk to the remaining medicine gathering sites and will impact Secwepemc opportunities to continue harvesting medicinal plants and materials and to access these sites.

Loss of Spiritual/Ceremonial Sites and Opportunities

Review of existing TU data has shown that the Upper Columbia River valley supports community gathering areas, seasonal hunting camps, sacred areas, health sites (places for healing and physical health), spiritual training areas, traditional story areas, named places, and burial sites. Spiritual areas represent the places to connect to the land and are foundations of Secwepemc culture. This relationship and connection extends beyond the physical context of the land. For example, one of the primary goals of the Shuswap Indian Band is to see salmon return to the Upper Columbia as a fundamental step to regaining their cultural-spiritual connection to the land.

The importance of spiritual and ceremonial sites to the Secwepemc cannot be understated. A single spiritual site may be considered in greater need of protection than multiple other traditional areas that are used for a different purpose. The level of impact on a spiritual site can extend beyond physical footprints. For example, quiet is important for both spiritual sites and hunting sites. Industry-related noise may make a spiritual site unusable. Should a spiritual site be rendered unusable, it is most likely that other uses such as campsites or hunting sites also become unviable.

As there is known spiritual and ceremonial use of the Upper Columbia River valley, there is increased potential for adverse effects on these areas, as well as on the opportunities to carry out Secwepemc spiritual and ceremonial traditions as a result of the proposed project.

Loss of Habitat Sites and Opportunities

Cabins (also used as teaching places), homes, campsites, overnight campsites represent the ability for Secwepemc peoples to be present on the land and continue their cultural practices. Habitation sites are associated and in proximity to where food and technology are stored, where particular resources are extracted, and/or where resources are processed and transported to a more permanent base. Habitation sites are situated to take advantage of seasonal resource availability in Secwepemcúlecw. Camping in the Revelstoke area is also used in association with other cultural activities such as plant collection, fishing, hunting and for meeting other Indigenous groups.

Additional adverse effects resulting from inundation and erosion of land build on the existing footprint impacts and adverse effects from reservoir and other land use activities on Secwepemc habitat sites and opportunities. As a specific TU study of the LSA has not been conducted, the extent of the effect of the proposed project on habitat sites and opportunities must be approached with an abundance of caution in order to avoid causing additional harm on Secwepemc Title & Rights.

Loss of Archaeological Sites and Remains

Archaeology concerns itself with human behavior written not as words but as physical traces on the landscape. These are read and interpreted via the application of archaeological methods to produce what is known as the “archaeological record”. The British Columbia *Heritage*

Conservation Act is a measure of the value of this record to the people of British Columbia, and in its administration, archaeological heritage is defined as "the physical evidence of how and where people lived in the past" (Archaeology Branch 2015). The concept of archaeology as scientific inquiry is represented in the assessment of "Scientific Significance" in determining the fate of archaeological sites via the Archaeological Impact Assessment process (Archaeology Branch 1998).

Given the Secwepemc have direct connections to those who produced the archaeological evidence in the LSA, and to the landscape with which these cultures evolved distinctive interrelationships and within which they still live, the archaeological record is of special value to the Secwepemc beyond the considerations of conservation management of the physical evidence whereby most contemporary archaeological inquiry is operationalized. The concept of archaeological evidence also includes its representation of land use and occupancy as it pertains to issues of sovereignty, Secwepemc Title & Rights, and also to constitutionally protected cultural identity. Stewardship of the archaeological record therefore must be carried out within a broader framework than is currently typical of most archaeological investigations, whether driven by research or by the far more frequent heritage resource management activities, including those associated with BC Hydro's reservoir operations in general and the Revelstoke 6 project in particular.

It is anticipated that the ongoing erosion, and resultant increase in localized erosion from Revelstoke 6 will continue to contribute to the loss of archaeological sites and resources in the LSA and the Columbia valley. The selection of Revelstoke 5 as the existing conditions is problematic and ignores the devastating effects of decades of development and operation of hydroelectric facilities on the Columbia valley's archaeological resources (Mohs 1977) and the inability for the Secwepemc people to access the majority of archaeological sites in the upper Columbia valley due to land access issues. The data gaps apparent due to the incomplete status of the archaeological inventory in the LSA represent a high level of uncertainty and therefore a high level of risk to previously unrecorded archaeological sites at risk of increased erosion from Revelstoke 6. As such, the assessment of the effects to archaeological resources within the LSA must be approached with extreme caution, and an assessment of the effectiveness of proposed mitigations to address adverse effects to known archaeological resources must be completed.

Loss of Access to Lands and Resources

The Upper Columbia River valley is an integral part of the Eastern Secwepemc seasonal round and represents a well-known travel corridor. Historic trails, travel ways, horse trails, currently used trails, access routes, and snowmobile routes represent traditional and current connective use of the land and resources as part of a culturally significant whole. Travel ways are important not only for access to resources or to significant areas, but also for transportation and trade of resources.

Ongoing challenges for access to lands and resources can be based around local rules, resource availability, and family relationships to name a few. More recently, with the advent of additional development and private land ownership, increased dangers and hazards exist where Secwepemc

peoples are either discouraged or even prohibited from accessing previously desirable areas for resource harvesting and resource management.

It is anticipated that the ongoing erosion and periodic inundation resulting from higher water levels and increased flows in the Columbia River and reservoirs will continue to contribute to the loss of access to Secwepemc lands and resources as many of the travel corridors are located along areas that are typically easiest to travel (e.g., valley bottoms).

Loss of Land and Resource Management

For Eastern Secwepemc communities, land does not merely represent a physical entity. Spending time on the land harvesting resources, camping, travelling through, meeting with neighbouring communities and participating in other cultural activities is crucial to maintaining a spiritual and cultural connection to the land and to sustaining their identity as caretakers of the land. Land has also been managed to maintain ecological resources through controlled burning, selective harvesting, cultivation techniques and employing foraging strategies.

When a proposed development such as this project considers an assessment based on a specific development footprint area, the complexities of the cultural and spiritual relationship with the land tends to be marginalized. It is therefore anticipated that there will be adverse effects on Secwepemc Title & Rights associated with direct loss of lands and resource management, as well as through further dispossession of lands. These adverse effects are further described below.

Mass wastage of soils over time via soil creep has considerable implications on the health and function of the aquatic and terrestrial communities that support Secwepemc resources. As this project will be permanent, capturing the extent of operational impacts of the Revelstoke 6 activities on soils is essential in understanding the risks to Secwepemc cultural resources as a result of the project. At this time, the extent of impacts of erosion as a result of the existing reservoir activities, as well as the proposed project, on Secwepemc Title & Rights remains unknown as a specific TU study of the LSA has not been conducted and the quantification of the transport processes and storage sites within the reservoir system has not undergone a detailed assessment.

Not only is there anticipated physical loss of land and resource management opportunities, but the additional development and associated proposed operational activity is anticipated to contribute to the lessened ability for Secwepemc peoples to protect the holistic worldview and Secwepemc relationship to the land.

Cumulative Impacts on Title & Rights

Potential adverse effects of the proposed project on Secwepemc Title & Rights (e.g., land and resource management, access to lands and resource management, archaeological sites and remains, habitat sites and opportunities, spiritual and ceremonial sites and opportunities, medicinal gathering sites and opportunities, plant harvesting areas and opportunities, hunting areas and opportunities, and fishing areas and opportunities) are anticipated due to a lack of baseline information as well as significant gaps in the understanding of the extent and

implication that these effects will have on the ability of the Secwepemc communities to carry on their cultural and spiritual connections with the land in and around the proposed project area. There are a number of existing key indicators (e.g., extirpation of salmon, endangered status of caribou and sturgeon, loss of lands and resource management areas, reduced abundance of plant species and other wildlife habitats, loss of archaeological sites and remains) that demonstrate that the current development and use of the Upper Columbia River valley has already eroded and fragmented Secwepemc territorial integrity and cultural continuity.

A comprehensive cumulative effects assessment on Secwepemc Title & Rights, including past, present, and (reasonably foreseeable) future development and impacts within a scientifically justifiable temporal and spatial scope, should be completed. This assessment should include both cultural and environmental impacts and should include all BC Hydro infrastructure and operations associated with Mica, Revelstoke, and Keenleyside Dams (e.g., access roads, transmission lines, capacitor stations and other associated infrastructure). Results of the cumulative effects assessment will inform the risk management strategy and management actions required to approach the Secwepemc interests that have already exceeded the limits of acceptable change.

H. DESCRIPTION OF MITIGATION MEASURES TO AVOID OR REDUCE EFFECTS ON SECWEPEMC TITLE & RIGHTS

Monitoring and adaptive management programs are integral steps of the process which inform the development of mitigation and compensation requirements, and increase the level of certainty and confidence surrounding the effectiveness of mitigation and management actions. Ongoing monitoring, investigation, and information dissemination are extensions of the proponent's duty to continue providing information on the hazardous activity or product over time. This approach helps to understand the level of risk and work required towards increasing confidence in the effectiveness of mitigation measures; however, it does not guarantee that the risk is lowered or eliminated or that there is additional confidence in the risk assessment. The safest alternatives to meet a specified need must be continuously evaluated with independent review.

Specific protection, enhancement, and mitigation measures are required to prevent and avoid adverse effects on valued components (e.g., stream channel works, lake fertilization, stand structure treatments, restoration of connectivity, habitat securement, artificial population and habitat enhancement). Some mitigation can be carried out now, with further measures implemented as the understanding of cumulative effects and success of mitigation measures is better understood. It is important to understand that where we wait to act for additional scientific proof of hazards that have already been experienced, some of the few remaining opportunities for truly preventative actions may be lost. A resilience-based approach should apply towards all of the proposed actions.

It is important to note that current mitigation strategies aimed at offsetting operational impacts on cultural and natural resources have had limited success (e.g. Fish Entrainment Strategy, Reservoir Revegetation Efforts...etc.). More importantly, there has been little effort to develop

and implement mitigation strategies, recognizing that the Water Use Planning process is aimed at first determining operational effects. The current approach is unacceptable and continues to present a high risk of further impacts to cultural and natural resources, and Secwepemc Title & Rights.

The following is a preliminary overview of Secwepemc expectations for mitigating the impacts on cultural and natural resources and Secwepemc Title & Rights. Further scoping and discussions are warranted as part of the overall consultation process with BC Hydro and the Provincial Government.

1. The first step in this process involves a comprehensive cumulative effects assessment to better understand past, present, and future impacts on cultural and natural resources in the Upper Columbia River Basin. The underlying objective of this assessment will be to identify the significance of impacts, acceptable thresholds, and limiting factors associated with cultural and natural resources within the Upper Columbia River Basin. This assessment would include, but is not limited to, environmental, archaeology, cultural heritage, and socio-economic impacts.

2. The second step in this process, which should be initiated prior to the completion of the cumulative effects assessment, is the development and implementation of adaptive cultural and natural resource management programs. Key components of these programs would include the development of acceptable thresholds for resource management, development and prioritization of mitigation strategies, implementation of mitigation strategies, and effectiveness monitoring. Again, these programs would include, but are not limited to environmental, archaeology, cultural heritage, and socio-economic mitigation strategies.

Mitigation measures which can be applied in the short term to better understand and offset adverse effects on Secwepemc Title & Rights include:

<u>Archaeology</u>

- Immediately develop and implement a mitigation strategy to address impacts to known archaeological sites in Arrow, Revelstoke and Kinbasket Reservoirs.
- Complete, within 3 years of the issuance of the EA Certificate, a compensation agreement that fully addresses the non-mitigatable impacts to archaeological resources impacted by operations of the Revelstoke 6 facility in the Arrow, Revelstoke and Kinbasket Reservoirs, including impacts to date and impacts reasonably foreseeable in the future.
- Complete an inventory of 100% of modeled high (this needs to be defined elsewhere in this document – i.e. if we are only ranking as low or high, give rationale) archaeological potential in the LSA, and a representative sample of low archaeological potential. This includes landforms at risk of bank failure above the reservoir high pool;
- Expand the archaeological potential model to other reservoirs in Secwepemc Territory;
- Revisit archaeological sites where inventory is incomplete, complete inventories and develop mitigation strategies for the protection and management of archaeological

resources;
- Commence biannual monitoring of effects on LSA archaeological sites at low pool;
- Expand archaeological studies to determine whether effects of Revelstoke 6 impacts the Nakusp Narrows and, if so, develop mitigation strategies to address these;
- Fund research regarding identification and investigation of intact sites above full pool;
- Develop and implement a culturally appropriate adaptive archaeological management plan, with involvement and training of community members to carry out this monitoring;. The short-term objective would include a much greater involvement with RAP and the long-term objective would be to assume the jurisdiction and coordination with other nations (e.g., Ktunaka and Syilx).
- Implement mitigation measures proposed in Part B; and
- Fund community members' education for archaeology/anthropology programs.

Environmental

- Based on the existing environmental impact levels resulting from previous hydro activities and other development and land use activities in the Upper Columbia River valley, in conjunction with high uncertainty surrounding the effectiveness of existing and proposed mitigation, the overall approach to the environmental impact assessment of the proposed Revelstoke 6 Project needs to apply a greater degree of precaution in the residual effects determination after mitigation;
- Expedite implementation of current (Rev 5) mitigation strategies (e.g. fish entrainment, reservoir and stream fertilization, increased shoreline erosion control, revegetation…etc.);
- Secure and purchase ecologically significant lands within the LSA for conservation, enhancement and stewardship activities;
- Soft operating constraints for the Middle Columbia River, Kinbasket Reservoir, and Arrow Lakes need to be formalized.; and
- Fund Secwepemc community members' education for environmental programs to support Secwepemc involvement in the implementation of the above mitigation strategies.

Cultural Heritage

- In recognition of the profound losses sustained by the Secwepemc people from the operation of the Revelstoke generating facility, fund and implement a Columbia Basin Cultural Heritage Management Board to address mitigation activities upstream of Nakusp.
- Complete, within 3 years of the issuance of the EA Certificate, a compensation agreement that fully addresses the non-mitigatable impacts to non-archaeological cultural heritage resources impacted by operations of the Revelstoke 6 facility in the Arrow, Revelstoke and Kinbasket Reservoirs, including impacts to date and impacts reasonably foreseeable in the future.
- As a short term measure, BC Hydro to provide funding for the construction and operation of a Secwepemc Cultural Heritage Center in the Columbia River Basin, potentially near Revelstoke or Golden.

Socioeconomic

Establishing mitigation measures to avoid or reduce effects in the social and economic realms required an initial measurement of baseline information. As discussed above there is currently no systematic primary data presented on which the -Community Wellbeing VC can be established for any of the six Secwepemc Nation Bands (members living on and off reserve), impacted by this project. The same holds true for the Economic VC where the three subcomponents of Economic Development, Labour Market and Non-Traditional Land and Resource Use do not have current baseline information and did not determine current capacity and utilization.

It is recommended that BC Hydro commit to the following:

- Funding to complete systematic primary data gathering for traditional socio-economy, and a comparative analysis of the changes to the Secwepemc socio-economy occurring over time to present as this relates directly and indirectly to the construction and operation of hydropower infrastructure on the Columbia River above Revelstoke.
- Work cooperatively with the Secwepemc to address recognized direct and indirect impacts through mitigation and compensation strategies.

Community Wellbeing

There are many rigorously tested, measures for assessing individual and community wellbeing. Amongst the measures there are five systems[23] that are low cost to implement and replicable across cultures and time. All require primary data collection at the individual level. A good example is the World Health Organization Quality of Life (WHOQOL)-BREF survey and indicator. To adequately assess the wellbeing of the six Bands (with multiple physical communities), would require the implementation of a survey of a significant random sample of member adults (individuals over 18 years old) in these Bands with a +-5% error (accuracy), 19 times out of 20 (reliability). Given the small populations, even if all communities in each Band were combined, a near 75% response rate would be required for this level of accuracy and reliability.

It is recommended that BC Hydro commit to the following:

- Provide funding to complete primary data collection on Community Wellbeing for the 6 directly impacted Secwepemc Communities.
- Work cooperatively with the Secwepemc to address recognized direct and indirect impacts through mitigation and compensation strategies.

Economic Development

For the subcomponent of economic development, there is a brief overview narrative; however, here too there is no baseline, resulting in the assessment missing the critical investigation of current commercial capacity by component by First Nation community and future planned

[23] Dronavalli, M, et al. Journal of Epidemiol Community Health, 2015; 69:805-815, ***A Systematic review of measurement tool of health and well-being for evaluating community-based interventions***.

capacity development. Without this critical background, the tasks and steps to ensure suitable engagement of the First Nations communities cannot be determined. For example, if there is a community approved, adequate system for commercial involvement in the project then there is limited need for mitigation measures. However, if there is not, then a mix of individual and business development is required immediately to enable commercial involvement in the project during implementation. The commercial development could be focused on direct project related sub-contracting, or indirect services to project workers and contractors.

Construction of Revelstoke Unit 5 demonstrated that nearly all the labour required must be skilled and certified. For the subcomponent of labour market, there is broad data for on-reserve members only, and the data is 5 years old. Unfortunately, the data that is five years old is not of the detail that would enable an assessment of current capacity with appropriate skills and certification by labour component, First Nation community, and future planned capacity to assess individual or community ability to participate as skilled labour in the project. To properly determine the next steps required for this sub component in the current context will depend on the detailed results of the systemically collected baseline data. Without the proper baseline, it becomes impossible to determine if there is an adequate approach to ensure suitable participation in the project.

As mentioned during the review, combining forestry, mining and agriculture into other land and resource use made it difficult to follow how each key sector, which has very unique attributes, was being assessed. In addition, with the tourism and recreation sectors there was a lack of a systematic overview and scoping of the usage and utilization in the LSA and RSA. This was further complicated by an overall inadequate baseline that again did not encompass a full understanding of how the resources were being utilized and their dependence on the LSA and RSA to sustain operations.

In addition, there was no information on how dependent First Nation communities are on the land and resource sector and the industries that they involve within the LSA or RSA. There was also no discussion of potential foregone activities First Nations are involved in or working towards and what mitigation would be considered.

It is recommended that BC Hydro commit to undertaking the actions outline under the Socioeconomic section above.

I. CHARACTERIZATION OF THE RESIDUAL ADVERSE EFFECTS ON SECWEPEMC TITLE & RIGHTS AFTER MITIGATION

Currently, although there remain significant gaps, there is sufficient information regarding the effects of existing reservoirs and operations on Secwepemc Title & Rights to understand that many of these rights have already been adversely effected, while Title has been significantly and unjustifiably infringed. Some examples include the impacts of ongoing erosion and loss of land due to the daily fluctuation in flows and water levels, the complete absence of anadromous salmon in the Upper Columbia River valley, endangered sturgeon continued population decline, archaeological resources and sites are exposed and damaged, and caribou populations and habitat

continue to decline and fragment. Decision over the development and operation of hydro-electric facilities have been made, until recently, with a complete disregard to the input of indigenous governments and impacts have gone un-noticed and unreported. We know that human activities, including BC Hydro infrastructure and operations have contributed significantly to these effects and infringements.

What remains unknown is the effectiveness of current mitigation measures at avoiding or minimizing adverse effects and infringements, as well as the extent of the effects on Secwepemc Title & Rights. The cumulative effects assessment requested above will provide additional knowledge on these gaps. There is a high level of uncertainty and risk by relying on ongoing effects and monitoring studies, as well as the preliminary (incomplete) results of Part B to establish a baseline condition and to determine residual effects on Secwepemc Title & Rights. It's important to also note that no amount of mitigation or compensation could completely offset the impacts on Secwepemc Title & Rights in the Upper Columbia Basin resulting from BC Hydro infrastructure and operations.

In general, the current approach to characterizing residual effects is deeply flawed in that effects and the effectiveness are merely predictions. Residual effects must be assessed through long-term adaptive monitoring programs following the application of mitigation, and must be measured against acceptable thresholds for change, as outlined in Section H. More importantly, all residual effects must be assessed and considered under a cumulative effects framework.

A preliminary characterization of residual effects on Secwepemc Title & Rights based on criteria described in
Table **61** are presented in Tables 62, 63, 64, and 65 and will require further consideration and revision as the requested mitigation measures presented in Section H are implemented.

Table 61: Criteria for the Characterization of Residual Effects on Secwepemc Title & Rights

Criteria	Description	Definitions	
Magnitude	Expected size or severity of the residual effect	Archaeological Resources	• Surface Disturbance • Partial Erosion • Total Erosion
		Fishing, food and medicinal plants, and Hunting Resources	• Low – within range of natural variation (<10 %) • Moderate – outside of range of natural variation (10-50%) • High – outside of range of natural variation (>50%)
		Spiritual and Ceremonial Sites	• Within range of natural variation • Outside of range of natural variation
		Access, Habitat Sites, Lands and Resource Management	• Low – Uninterrupted access and ability to use • Moderate – Partial access and ability to use • High – No access and inability to use

Criteria	Description	Definitions
Context	The current and future sensitivity and resilience of the VC to change caused by the project.	• High resilience and low sensitivity to change • Moderate resilience and moderate sensitivity to change • Low resilience and high sensitivity to change
Extent	Spatial scale over which the residual effect is expected to occur	• Site-specific (Revelstoke Reach – RR, Mid-Columbia Reach – MCR, Capacitor Station – CS, Construction Area – CA) • Local • Regional • Out of scope
Duration	Length of time over which the residual effect is expected to persist	• Short term • Long term • Permanent
Frequency	How often the residual effect is expected to occur	• Never • Infrequent • Frequent • Continuous
Reversibility	Whether or not the residual effect can be reversed once the physical work of activity causing the effect ceases	• Fully reversible • Partially reversible • Irreversible

Table 62: Summary of Residual Effects of the Project on Secwepemc Title & Rights as they relate to Archaeological Sites and Remains

Effect	Criteria	Rating	Rationale
Measurable Disturbance to or Loss of Archeological Sites	Magnitude	Surface Disturbance Subsurface Disturbance Unauthorized Collection Partial Erosion Total Erosion	• Increased erosion resulting from periodic increases in flow volume. (Measurable disturbance or loss of archaeological heritage resources • Predicted effects are based on modeling using data with insufficient precision • High level of uncertainty regarding the actual magnitude of predicted effects • Loss of evidence of use and occupation, directly related to strength of claim
	Context	High Sensitivity and Low Resilience	• Existing condition is heavily disturbed and sites are sensitive to erosion and have no resilience following disturbance without mitigative measures
	Extent	Revelstoke Reach (RR) Mid-Columbia Reach (MCR) Out-of-Scope (OOS)	• The project LSA where predicted and unpredicted effects of erosion impact archaeological resources • Both the number of archaeological sites and the extent of the predicted effects are not well understood • Incomplete inventory of the archaeological resources in the LSA • Effect may be present in the Nakusp Narrows, unknown whether LSA is an appropriate selection based on current information
	Duration	Permanent	• Once the effect takes place, the effect will remain in perpetuity
	Reversibility	Irreversible	• Archaeological resources are non-renewable, once they have been disturbed or destroyed

Effect	Criteria	Rating	Rationale
			they are gone forever
	Frequency	Frequent	• Effects will take place on an annual basis, at all ALR pool elevations, and potentially daily
Change in the accessibility of archaeological sites	Magnitude	Surface Disturbance Subsurface Disturbance Unauthorized Collection	• Decrease in accessibility for cultural purposes • Increase in accessibility could result in site damage by 4x4 recreationalists and increase in unauthorized collection
	Context	High Sensitivity and Moderate resilience	• Existing condition partially or completely restricts access to majority of archaeological sites in LSA • Increase or decrease in accessibility will have both adverse and beneficial impacts
	Extent	Revelstoke Reach (RR) Mid-Columbia Reach (MCR)	• Both the RR and MCR portions of the LSA will result in changes in accessibility, and the potential for changes in accessibility to unknown archaeological sites
	Duration	Long term	• Effect will last for duration of the project, but will cease after the project is decommissioned
	Reversibility	Partially Reversible	• Effect is reversible, but loss or disturbance resulting from effect will be permanent
	Frequency	Infrequent	• Changes in accessibility measures in hours or days in a year.

Table 63: Summary of Residual Effects of the Project on Secwepemc Title & Rights as they relate to Fishing, Plant and Medicine Gathering Areas and Hunting

Effect	Criteria	Rating	Rationale
Measurable Disturbance to or Loss of Fishing, Hunting, and Plant and Medicine Harvesting Areas and Opportunities	Magnitude	Moderate	• Overall, the level of disturbance is anticipated to further impact distribution of these cultural resources. This level of disturbance will vary depending on the specific cultural resource. For example, there could be specific plants • High level of uncertainty regarding the actual magnitude of predicted effects
	Context	High sensitivity and Low Resilience	• Salmon, sturgeon, caribou are all examples of species that are either endangered or extirpated from the LSA. These species remain unavailable for cultural use as a result of historical reservoir activities.
	Extent	Revelstoke Reach (RR) Mid-Columbia Reach (MCR) Local Regional Out-of-Scope (OOS)	• A number of these cultural resources are distributed beyond the project area and extend or migrate through the region.
	Duration	Permanent	• Without mitigative, enhancement, or protective activities, it is expected that the impacts of the activities on these cultural resources will be permanent. • There is a high level of uncertainty on the effectiveness of many of the existing mitigation measures. What we do know is that for a number of these resources, they are no longer available for cultural use.
	Reversibility	Irreversible	• For many of these cultural resources, the effect will not be reversible as dam activities

Effect	Criteria	Rating	Rationale
			are intended to be permanent and the footprint impacts are directly associated with loss of certain habitats and growing conditions.
	Frequency	Frequent	• Effects will take place on an annual, seasonal, and daily potential.

Table 64: Summary of Residual Effects of the Project on Secwepemc Title & Rights as they relate to Spiritual and Ceremonial Sites

Effect	Criteria	Rating	Rationale
Measurable Disturbance to or Loss of Spiritual and Ceremonial Sites	Magnitude	Outside of range of natural variation	• Because there are known spiritual and ceremonial sites in the area, the it is anticipated that effects associated with the project will be greater than what would naturally effect these areas and opportunities • High level of uncertainty regarding the actual magnitude of predicted effects
	Context	High sensitivity and low resilience	• Impacts to spiritual and ceremonial sites and opportunities extend beyond the physical context and
	Extent	Revelstoke Reach (RR) Mid-Columbia Reach (MCR) Local Regional Out-of-Scope (OOS)	• The relevance of spiritual and ceremonial sites is such that a particular site may • Both the number of spiritual and ceremonial sites and the extent of the predicted effects are not well understood
	Duration	Permanent	• Once the effect takes place, the effect will remain in perpetuity
	Reversibility	Irreversible	• Spiritual and ceremonial resources are non-renewable, once they have been disturbed or destroyed they are gone forever
	Frequency	Frequent	• Effects will take place on an annual basis, at all ALR pool elevations, and potentially daily

Table 65: Summary of Residual Effects of the Project on Secwepemc Title & Rights as they relate Access, Habitat Areas, Land and Resource Management

Effect	Criteria	Rating	Rationale
Measurable Disturbance to or Loss to Access, Habitat Sites, Land and Resource Management Opportunities	Magnitude	Moderate	• In addition to the extent of physical land being lost to inundation and increased erosion, these areas may be associated with are accessible through lands that are going to be lost to erosion or inundation. • High level of uncertainty regarding the actual magnitude of predicted effects
	Context	High sensitivity and low resilience	• Changes to the soil material and hydrological regime can heavily alter ecosystem function and primary productivity.
	Extent	Revelstoke Reach (RR) Mid-Columbia Reach (MCR) Local Regional Out-of-Scope (OOS)	• The project LSA where predicted and unpredicted effects of erosion impact to access, habitat, and land and resource management areas. • Incomplete inventory of these resources in the

Effect	Criteria	Rating	Rationale
			LSA
	Duration	Permanent	• Once the effect takes place, the effect will remain in perpetuity
	Reversibility	Irreversible	• As the project timeline is permanent, it is expected that effects on access, habitat and land and resource management areas and opportunities will be irreversible as they may be so altered that they would not be able to return to the original condition.
	Frequency	Frequent	• Effects will take place on an annual basis, at all ALR pool elevations, and potentially daily

There is high likelihood that there will be residual effects to Secwepemc Title and Rights as a result of the proposed project. When looking at the existing condition as a baseline, there is already cultural and spiritual disconnect and marginalized ability for Secwepemc peoples to maintain their identities through the strong connection to the traditions and land-use practices of their ancestors. Archaeological sites and remains, salmon, sturgeon, caribou are just a few examples of cultural resources that have already exceeded the cultural thresholds of change and are either heavily impacted or have already become lost Secwepemc traditions.

Because of significant data gaps in the understanding of the effectiveness of mitigation measures, the nature of the project with the VC interaction, and context and extent of TU data in the LSA, there is a lower level of confidence associated with the residual effect predictions. To address this uncertainty, a precautionary approach is required wherever a decision may serve to eliminate or reduce a hazard. It can be applied both in preventing hazards and in restoring past or ongoing damage to ecological health, where there are reasonable grounds to believe that harm may result. A requirement of this approach is that provisions are included for wider ecological margins of error where there is uncertainty surrounding ecosystem capacity to absorb harm, including from cumulative sources. The more serious the magnitude and nature of the potential harm, the wider the margin for error in the assumption of risk.

Protective, enhancement or mitigative actions need to respond to early warnings, such as when there is credible evidence that harm is occurring or is likely to occur. These actions need to take place, even if the exact nature and magnitude of the harm are not fully understood. The need for preventative action and the development of appropriate thresholds for action when there is a significant threat, and not only when concerns reach the level of serious or irreparable damage, is imperative in protecting Secwepemc Title & Rights.

J. SUMMARY OF ANY OUTSTANDING SECWEPEMC ABORIGINAL TITLE & RIGHTS ISSUES IDENTIFIED

1) Known patterns of Secwepemc use and occupancy from the past exist; however, the connections to the impacts cannot be made due to the extent and magnitude of change. The final stages of the reservoir development and operational activities are being proposed with Revelstoke 6 and considerable gaps and uncertainty about the existing impacts on Secwepemc Title and Rights remain outstanding. For example:
   (a) Critical travel/trade routes are cut;
   (b) Access to important spiritual, ceremonial and gathering areas, resources and values (this needs to be defined in terms of the inter-relationship between resources and landscapes – spirituality – health and well-being and the economy of the Secwepemc) have been terminated or significantly altered; and
   (c) Archaeological sites, including village sites and grave sites, have been or are in the process of being destroyed;
2) Secwepemc culture is a land-based culture. Reservoir operations and other land resource development activities in the Upper Columbia River valley has altered the nature and function of the landscape to such an extent that there is a Secwepemc cultural disconnect with the land. This must be quantified and reversed;
3) The extent of the overall negative physical, spiritual and mental health impacts of the changes of lifestyle as a result of the abandonment of Secwepemc traditional activities, remains unknown but must nevertheless be quantified and addressed;
4) Water in the Columbia River valley is being managed for power generation and flooding control, with some consideration to environmental requirements. There is currently no management consideration or plans for Secwepemc Title and Rights;
5) Secwepemc way of life has been significantly altered and impacted with respect to BC Hydro past hydro development and on-going activities in the Columbia River valley including cultural heritage, social and economic, environment and archaeology;
6) There has been no free and prior informed consent involving the Secwepemc on any previous hydro development activity and hydro operations in the Columbia River basin. Furthermore, the Secwepemc have not been consulted, involved, compensated or engaged in any respect to mitigation planning until this current proposed project.

K. SUMMARY OF PUBLICALLY AVAILABLE ARRANGEMENTS OR AGREEMENTS REACHED BETWEEN THE PROPONENT AND SECWEPEMC OR SPECIFIC SECWEPEMC COMMUNITIES

With respect to the Rev 6 project, there are no arrangements or agreements available, publicly or otherwise, reached between BC Hydro and the Secwepemc at the community, Division or Nation levels.

12.2 OTHER MATTERS OF CONCERN TO ABORIGINAL GROUPS

In addition to the potential adverse effects of the proposed project on Secwepemc Title & Rights that have already been discussed, the following sections describe other matters of environmental, social, economic, heritage and health concerns of the proposed project to Secwepemc communities.

12.2.1 ENVIRONMENTAL EFFECTS

The connections between all living things is fundamental to Secwepemc identity and ability to act as caretakers of the land. Valued components, as identified through the BC EAO process, can oversimply the complex nature of the surrounding environment and its interconnected relationships.

When the Revelstoke dam was initially constructed, there was a lack of suitable information to appropriately assess levels of significance of potential impacts to ecosystems and species (Utzig and Schmidt 2011). As a result, there have been considerable impacts to the ecological conditions of the Upper Columbia River valley with little understanding surrounding the significance of these impacts and how to effectively compensate for them.

While more recently there has been a tremendous amount of work and effort undertaken to better understand the level of impact associated with previous hydro activities, gaps remain not only in the understanding of the baseline conditions of the proposed project assessment, but also as to how this project information relates to the complicated nature of ecological function and processes, population viability, primary productivity, natural disturbance regimes, floodplain processes, trophic dynamics, nutrient cycling, genetic exchange, predator/prey dynamics, reproduction, dispersal, seasonal migrations, susceptibility to invasive species, and altered annual hydrologic regimes.

Because the nature of threats to Secwepemc Title & Rights in the Upper Columbia River valley is complex and uncertain, an abundance of caution needs to be applied towards any future management decisions and actions. Where there is credible evidence that harm is occurring (e.g., impacts to fish movement, permanent loss of upland and riparian terrestrial habitats, nutrient effects, erosion, loss of seasonal habitats), protective measures and actions need to take place, even in the absence of a full understanding of the extent and magnitude of the harm. A comprehensive cumulative effects assessment including past, present, and reasonably foreseeable future development and associated impacts should be completed to capture the potential for residual cumulative effects on Secwepemc Title & Rights.

12.2.2 ECONOMIC EFFECTS

Without an adequate economic baseline at the individual First Nation Band level, it is a challenge to estimate the positive or negative economic effects of the project on individual Bands, the six Bands combined or aboriginal people living within the LSA or RSA. It is also a

challenge attempting to connect the situation for Revelstoke Unit 5 or the recent Mica projects to potential results for the planned Revelstoke Unit 6 unless there is systematic access to employment, subcontracting, and service provision during construction, as structured in the recent Mica projects.

It is key to Secwepemc communities that there is systematic access to the potential positive economic effects of the Revelstoke Unit 6 project.

12.2.3 SOCIAL EFFECTS

There are no Secwepemc communities within the LSA where the bulk of the potential positive and negative social impact concerns are focused. It is expected that there will be some Secwepemc members living within the LSA, (living off reserve) at the time of construction experiencing the spectrum of social impacts from the project. There are Secwepemc communities within the RSA that could potentially capitalize on the positive social effects given the projected limited access to housing. The projected housing limitation is expected to limit the potential for residents, including Secwepemc members and their families, to enjoy the social benefits derived from consistent employment and potential formal certified training for and during project construction.

Other potential social effects are difficult to ascertain with the lack of a reliable baseline, program goals and outcomes confirmed with Secwepemc communities and mechanism to measure pre-designed pre-and post metrics that is able to isolate the cause and effect relationship and focus on identifying community success as a result of the project. It is key to Secwepemc communities that there is systematic access to the potential positive social effects of the Revelstoke Unit 6 project. Also, it is critical that a timely and representative measuring system be implemented to monitor and adjust interventions to maximize the positive social impacts of the project.

12.2.4 HERITAGE EFFECTS

The Secwepemc is a diverse Nation, and the Territory covers a wide geographic area where people have developed unique cultural practice, such as ceremonies, subsistence strategies, and linguistic dialects, which differ between bands. The impact, in general, of development projects such as dams, and more broadly, participation in global markets, can have a negative effect on maintaining cultural diversity, and therefore cultural heritage. Worldwide it has been recognized that protecting diversity is a human rights concern, in particular relevant to Indigenous Peoples:

> *The defence of cultural diversity is an ethical imperative, inseparable from respect for human dignity. It implies a commitment to human rights and fundamental freedoms, in particular the rights of persons belonging to minorities and those of indigenous peoples. (UNESCO: Article 4 2001).*

Protecting heritage, and even identifying what one's heritage entails, in order to better grapple with in what ways development has, or will, impact it, can be challenging. Cultural Heritage includes such things as, places on the landscape where cultural activities take place, and implies

a connection to the past, therefore encompassing such things as archaeological sites (e.g. see Millennia 2012, re measurable negative effects to archaeological sites due to water, wind, and erosion in the Arrow Lakes Reservoir). However, Cultural Heritage also is concerned with knowledge, such as language, oral history, music remembered and passed down. Many of the cultural practices, unique to the Secwepemc bands, while deeply embedded in the landscape, are not always linked directly to places on the landscape, or they may be, but are not linked only to one place. For example, while areas with past and present birch trees may be mapped during a Traditional Use Study, the knowledge of how to make a basket passed down from one's grandmother is an example of a non-site-specific type of Traditional Ecological Knowledge. During community mapping interviews conducted in Secwepemc Territory, Traditional Use Values are one type of heritage which may be recorded and can be assessed for impacts by development.

Traditional Use (TU) Values (what is impacted) is defined as, in the context of Traditional Land Use Studies, a 'Value' refers to a specific place, resource, or interest reported by a First Nation member during the study, and considered important to the on-going practice of that First Nation's rights and use. A Site-Specific TU Value is one that is reported as specific and spatially distinct and may be mapped (though locations may be considered confidential). Site-Specific Values, such as cabins, trails or animal kill sites, reflect specific instances of use that anchor the wider practice of livelihood within a particular landscape. A Non-Site-Specific TU Value may be specific to a resource or other concern, but is spatially indistinct or difficult to map. Non-Site-Specific Values include critical conditions or elements that must be present for the continued practice of Aboriginal Rights, such as the hunting and gathering of wild foods. As such, Non-Site-Specific Values range from the direct presence of traditionally hunted animals and other wild foods on the land to continued access to traditional hunting areas and non-contaminated sources of wild foods. Non-Site-Specific Values also include intangible cultural resources, such as the transmission of knowledge across generations and continued use of traditional place names. Research undertaken during the Revelstoke 6 Cultural Heritage Assessment will provide more detailed information on community concerns regarding heritage, TEK, and the impacts of industrial development.

Although there are a large number of Secwepemctsin place names recorded within the LSA (from previous research), funding from BC Hydro is imperative to specifically record additional place names within the LSA which have not been previously documented. For example, Simpcw has a large archive of Secwepemctsin place names for areas where they have been funded to do TUS and LUOS. Simpcw has the largest percentage of Secwepemctsin speakers in the study area and identifies the need for additional research. Furthermore, place names research will assist in accurately assessing cultural heritage impacts from Project. All six Secwepemc Bands have requested funding from BC Hydro to conduct CHA and/or LUOS research specific to the LSA.

While the 1927 amendment to the *Indian Act* criminalized fighting for their lands and way of life, another government policy, initiated in 1884 had begun to have an affect by the 1920s. This policy was set up by the Canadian government and administered by churches. It had the claimed objective of educating Aboriginal children but also the more damaging and equally clear objectives of indoctrinating them into Euro-Canadian and Christian ways of living and thus assimilating them into mainstream Canadian society. From 1920 onwards attendance at

residential schools was mandatory for all Aboriginal children aged 7-15. The majority of Eastern Secwepemc school-age children were sent to attend the Kamloops Indian Industrial (later known as Residential) School or the Cranbrook (St. Eugene's) Indian Residential School.[24]

> *The Secwepemc language, culture, and way of life are being severely endangered and on the verge of extinction. The onslaught of colonization and forced attempts at assimilation and acculturation inflicted devastating atrocities on the Secwepemc way of life. Their lands, culture, and language were systematically attacked and destroyed. The oppressive and paternalistic efforts of the Canadian government and various churches to suppress language and culture were almost successful; however, remnants of the language and culture remain intact (Secwepemcúlecw, Land of the Shuswap 2016).*

In addition to the negative impacts of Canadian Government policies on Indigenous languages, participation in the economy of British Columbia has had a negative effect on Peoples' ability to retain their Indigenous languages. These impacts are summarized in the fact sheet of the 2014 Report on First Nations Languages in B.C. which attributed the dramatic decline in B.C. First Nations languages since the 1800s to the following causes:

- *The Canadian government's mandated assimilation policies which outlawed First Nations cultural practices and separated First Nations communities from their land*
- *The Residential School system followed by Indian Day Schools that removed First Nations children from their homes and forbade them to speak their languages*
- *Social, industrial and cultural pressures from the dominant English-speaking society*
- *Exclusion of First Nations languages from government, commerce, industry, arts, education and media*

(First Peoples' Cultural Council 2014:2).

In order to hold a job, and participate in the European-introduced economy of BC, Eastern Secwepemc Peoples have been forced to adopt a way of life which relies on certain assumptions – namely that English is required for day-to-day dealings outside of one's home. Historically Canada has been an inhospitable climate for maintaining Indigenous languages, however, the revitalization movement which began, in the 1980s in Secwepemc Territories, continues, through the actions of the T'selcéwtqen Clleqmél'ten/Chief Atahm School. The First Peoples' Cultural Council continues to publish online about the state of the Secwepemc language and culture, and encourage initiatives to maintain it (FPCC 2016).

Secwepemctsín, in its various dialects, is the language spoken by the Secwepemc, or Shuswap, Peoples. Secwepemctsín is an Interior Salish family language. See section F of this report for more details about the dialects. In British Columbia, the active suppression of Indigenous

[24] At these schools, in operation until 1978 and 1970, respectively, students were punished by strapping and received corporal punishment for speaking languages other than English. Allegations of extensive sexual, physical, mental, and Spiritual abuse and attempted suicides of children while attending these schools and adult survivors have been reported (Indian Residential School Sources 2014 see Indigenous Foundation 2009).

languages, through the residential school system, and making it illegal to practice one's culture, has created a situation where very few elders are available to mentor the next generation in learning the Secwepemctsín language.

First Voices is a project run by The First Peoples' Cultural Council (FPCC), which collects and tabulates statistics regarding the state of Indigenous languages within the province of British Columbia (see also the Canadian Government census statistics quoted in this report, Section 12.2.4). The low response rate on the government census surveys, in addition to the statistical measures employed by the Canadian Government, to deliberately distort the numbers for privacy reasons, means that the First Voices statistics represent a more accurate, on-the-ground, assessment of the number of people who currently speak Secwepemctsín[25]. According to the 2014 report on the state of First Nations' languages in BC, there were 197 Status Native fluent speakers of Secwepemctsín in 2014, compared to 249 Status Native fluent speakers of Secwepemctsín in 2010, in addition, 1187 Status Native semi-speakers of Secwepemctsín in 2014 were reported (there is no corresponding number for 2010 on this statistic) (First Peoples' Cultural Council 2014b:25). In 2014 this meant approximately 2% of the Secwepemc Status Native population spoke fluent Secwepemctsín (First Peoples' Cultural Council 2014b:35). The breakdown of fluent speakers for the communities discussed in this report are listed in Table 66, 67, and 68 below.

Table 66: Number of Secwepemctsín speakers/learners divided by Band.

First Nations Band	Fluent	Understand or Speak Somewhat	Learning Speakers
Kenpesq't (Shuswap)	1	2	0
Neskonlith	8	22	23
Sexqeltqín (Adams Lake)	10	90	96
Simpcw	9	147	59
Skw'lax (Little Shuswap)	5	20	52
Splatsin	8	14	63

Table 67: Population, divided by Band.

First Nations Band	Population, as of July, 2016 (AANDC 2016)
Shuswap	262
Neskonlith	657
Adams Lake	796
Simpcw	716
Little Shuswap Lake	349
Splatsin	893

[25] For example, in order to maintain privacy in communities with low populations where it may be easy to identify an individual, Canada census statistics may be rounded to 5-10%, which can be a significant distortion of numbers when dealing with communities of approximately 300 persons. See stats Canada website for further information about their privacy policy (AANDC 2016). First Peoples' does not have a mandate to conceal individuals represented by the statistics regarding who is speaking the language, therefore it is possible for language revitalizers to simply count how many people are attending classes, asking for resources, etc. FPCC is a BC crown corporation that provides programs that promote and fund language revitalization. For example, "Language Champions" are listed on the website for Secwepemctsín which identifies some fluent speakers and learners by name (First Peoples' 2016).

Table 68: Percentage of Secwepemctsín speakers/learners divided by Band.

First Nations Band	Percentage of speakers/learners (FPCC 2016) within the registered bands' populations (AANDC 2016)
Kenpesq't (Shuswap)	1%
Neskonlith	8%
Sexqeltqín (Adams Lake)	24%
Simpcw	30%
Skw'lax (Little Shuswap Lake)	22%
Splatsin	9%

In spite of the dire state of Indigenous languages in BC, and worldwide, and the decrease of fluent speakers, there has been a surge of interest in learning Secwepemctsín. Comprehensive Community Plans for Shuswap Band (2016), Little Shuswap Lake Indian Band (2015), and Splatsin (2013), and Adams Lake Indian Band (2015) all identify language revitalization as a top priority, and propose initiatives to encourage the speaking of Secwepemctsín[26]. For example:

- *Integrate culture into more community events and practices, and hold more ceremonies and cultural gatherings. Splatsin (2013:ii)*
- *Continue to offer and promote language classes for all members, regardless of age.*
- *Incorporate language and culture (i.e. drumming) into daycare and after-school programs.*
- *Encourage volunteers to help with fostering language and culture in the community.*
- *Ensure that language teachers are qualified and have access to the technology that will help facilitate easier learning.*
- *Consider developing and offering Parent-Child Mother Goose-type program in Secwepemc. Little Shuswap Lake Indian Band (Urban Systems 2015:8).*
- *Continue to teach, share, and spread knowledge of Secwepemctsín and the local dialect;*
- *Work towards increasing access to cultural education and language classes for children of all ages; Support all members (including off-reserve) in accessing language learning programs including online services and classes via Skype; Examine the possibility of using a new name for the community;… (Shuswap Band 2016:18).*

These initiatives will help in revitalizing Secwepemctsín. Indigenous language speakers have the right to learn and speak their language, and furthermore, by ensuring the continuation of this language the rights of future generations are also safeguarded, to a degree. The fundamental importance, reflected in the Comprehensive Community Plans, in protecting the right to language, is also identified internationally in the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP), (Office of the High Commissioner for Human Rights 2008). For example, Article 13.1 states that:

> *Indigenous peoples have the right to revitalize, use, develop and transmit to future generations their histories, languages, oral traditions, philosophies, writing systems and*

[26] Neskonlith's Comprehensive Community Plan is in progress, publication pending.

> *literatures, and to designate and retain their own names for communities, places and persons. (Office of the High Commissioner for Human Rights 2008:7).*

The "First Peoples' Heritage, Language and Culture Act of BC" also identifies that the province of BC wishes to: "Protect, revitalize and enhance First Nations heritage, language, culture and arts," (First Peoples' Heritage and Language and Culture Act 1996, up to date as of 2012).

The Secwepemc Nation has actively maintained their commitment to their culture and language through education. One of the most successful undertakings to encourage the speaking of Secwepemctsín, and the retention of it as a living language, is the immersion school, the first in BC. The opening of this school marked the emergence from the residential school era by returning control of education to the community.

T'selcéwtqen Clleqmél'ten, a.k.a. Chief Atahm School, was initially inspired by a Māori initiative in New Zealand, *Te Kohanga Reo*. Now with multiple centres in Australia and New Zealand, the concept is to create a language nest for young children to be immersed in the Māori language and culture. For example:

> *Kohanga Reo is an early childhood education and care (ECE) centre where all education and instruction is delivered in te reo maori (Maori language). At Kohanga Reo mokopuna (children) are totally immersed in Maori language and tikanga (culture) from birth through to the age of six. (Te Kōhanga Reo 2016).*

In the same way, T'selcéwtqen Clleqmél'ten, Chief Atahm School has created a program where students learn Secwepemctsin, as well as traditional Secwepemc approaches to learning, and BC curriculum topics. In addition to offering day-school students a K-10 program with varying levels of complete or partial immersion, there are additional programs for learners from six-months of age to adult learners, including support for online learners and teachers at other institutions who require training and resources for setting up their own language programs.

In 1987 parents from Adams Lake Indian Band, Neskonlith Indian Band, and Little Shuswap Lake Indian Band, worked together to create a language nest for Secwepemc children 0-5 years of age, this in turn lead to the creation of a Secwepemc immersion school (T'selcéwtqen Clleqmél'ten, Chief Atahm School website 2016). (See also the community profile for Adams Lake in this report, section 12.1.1.f.). The UNDRIP (Article 14.1) states that Indigenous people have a right to teach in their language:

> *Indigenous peoples have the right to establish and control their educational systems and institutions providing education in their own languages, in a manner appropriate to their cultural methods of teaching and learning. (UNDRIP 2014:7).*

And furthermore, in Article 14.3:

> *States shall, in conjunction with indigenous peoples, take effective measures, in order for indigenous individuals, particularly children, including those living*

> *outside their communities, to have access, when possible, to an education in their own culture and provided in their own language. (UNDRIP 2014:7).*

The T'selcéwtqen Clleqmél'ten, Chief Atahm School, explains that their learning strategy is holistic, the language is taught embedded in teaching techniques which encompass Secwepemc cultural values which goes well beyond mere route memory of a linguistic system.

> *The school was founded in 1991 and is grounded in the belief that knowledge of the language, traditional practices and beliefs of the Secwepemc will help develop a strong and healthy community, Students will be prepared for today's world and will help protect the earth for the Tellgelmucw, "the people to come". (T'selcéwtqen Clleqmél'ten, Chief Atahm School website 2016).*

The important links between language, cultural teachings, and overall health of Indigenous communities is recognized worldwide:

> *This learning space has the powerful potential to build identity, well being and belonging. It also aids the prevention of Maori disengaging; or even rejecting the existing educational systems offered today. Being connected to the educational system through Te Kohanga Reo creates a stronger sense of belonging between the akonga to their culture, language and arts but also to their extended Maori community. (Te Kōhanga Reo 2016).*

Language is also linked with the landscape, and by revitalizing the language, people are able to make a direct connection to the landscape of which they are part. In this way, knowledge of place names and TEK (Traditional Ecological Knowledge) are an interconnected part of cultural restoration which goes hand-in-hand with language revitalization.

A language cannot be lost without also losing the information which is contained within it and is specific to that culture and that language. Retention of language diversity is of culturally-universal importance, as has been identified by other researchers. This is an issue of global importance, beyond that of the descendant community of the Peoples' who spoke a given language.

> *Language is the way a culture is transmitted—it represents the identity of a people and holds cultural, historical, scientific and ecological knowledge. When a language is lost, we all lose out on the knowledge held within it and the unique way its speakers view the world. (First Peoples' Cultural Council 2014).*

When interviewed about the state of the language Elders, and other knowledgeable community members, from Adams Lake Indian Band had this to say about the language:

> *"More just in the last couple of years people have begun to say 'I know my language' ... A lot of people or individuals understand more, the people that understood more at one time wouldn't admit they understood. Now they are saying 'I understand.'…The Elders, mid-fifties to sixties, I know six people that understand the language well, whereas five years ago they wouldn't admit they*

understood." Adams Lake Elder 2016 ID1519 (Behr et al. 2016 publication pending).

"They are learning [Secwepemctsín] in the school now, but it is only, I guess you would say, more level one. It is not regular; it is not about learning the full language, it is about self-esteem. We have some language even if it is one or two words."
Adams Lake Elder 2016 ID1519 (Behr et al. 2016 publication pending).

12.2.5 HEALTH EFFECTS

Secwepemc Perspectives on Health and Cumulative Effects

As the above section illustrates, the ability to learn and speak one's language, has a significant effect on peoples' mental health. While it is possible to write about general impacts to cultural heritage and health from industrial development, a project-specific study is required, in order to adequately assess project impacts. Data gaps exist, because research has not been specific to Revelstoke 6. All six Secwepemc Bands have requested funding from BC Hydro to conduct CHA and/or LUOS research specific to the LSA in order to address the large gaps in data and better understand the effects of the Project on their rights. Simpcw notes that they have mostly being left out of the consultation process for decades, it is crucial that Simpcw First Nation be funded for this[27]. For example, as was mentioned earlier in this report, the entire community is potentially affected when further destruction of fishing areas occurs. Family structures, and the passing on of TEK to children is negatively impacted with the continual infringement on important areas (e.g. traditional hunting, fishing and gathering sites). In light of this, more information would be provided, upon conducting interviews, researching, and reporting, as part of a CHA and/or LUOS.

Furthermore, within the context of major industrial developments, such as dams, which have the potential for significant impacts on the Secwepemc territory, the risks to human health and health of ecosystems requires additional research. Risks to health are associated with the inability to access or participate in traditional resource harvesting activities. It has been determined that for natural resource-based societies, physical risks, or even perceived dangers to peoples' health posed by environmental pollutants, have measurable effects on cultural continuity (Alfred, McCarthy and Spak 2006). Thus, the linkages between perceived health risks and changes in culture need to be considered. The overall negative physical and mental health impacts of such changes in lifestyle not only result from the abandonment of traditional activities and the myriad

[27] See Simpcw FN (2009:2, section 2.7) "BC Hydro has been occupying the Simpcw's territory since the 1970s, when it constructed the Original Project [Mica 5&6] without any consultation with the Simpcw. The Simpcw were completely left out of any discussions surrounding the terms of the Treaty, as well as, the construction and operation of the Original Project. The flooding of the Columbia River and construction of the Original Project had devastating consequences to the Simpcw's territory and traditional way of life. These past infringements still need to be addressed today, especially in light of the proposed Project. Further, any discussions with respect to the Project must necessarily include addressing the impacts resulting from the Original Project…."

of long-term intergenerational effects this has on Indigenous Nations such as the Secwepemc, but also from the simple fact that the food that tends to be available to replace “traditional food” is generally high in fats and sugars and lacks the nutrients, high-quality proteins, minerals and vitamins of traditional foods (Alfred, McCarthy and Spak 2006).

12.2.6 MITIGATION MEASURES

Mitigation measures are as per the measures described in Section 12.1.h. Description of mitigation measures to avoid or reduce effects on Secwepemc Title & Rights.

12.2.7 RESIDUAL ADVERSE EFFECTS (POST MITIGATION)

Residual adverse effects are as per the effects described in Section 12.1.i. Characterization of the residual adverse effects on Secwepemc Title & Rights after mitigation.

12.2.8 DESCRIPTION OF HOW THESE MATTERS OF CONCERN HAVE BEEN ADDRESSED FROM THE PERSPECTIVE OF THE SECWEPEMC

To a large extent, these matters of concern have not been addressed by BC Hydro through the Environmental Assessment application process (see disclaimer). Further discussions between Secwepemc parties and BC Hydro are warranted.

Issue Summary Table

Table 69: Summary Table of the Results of Aboriginal Consultation related to Aboriginal Interests/Other Matters of Concern to Eastern Secwepemc Peoples

Aboriginal Group	**Consultation Stage / Information Source**	**Issue – Aboriginal Interest**	**Issue – Other Matters of Concern**	**Analysis of Potential Effect**	**Proposed Measures to Avoid, Mitigate or Otherwise Manage Effects**	**Status of Issue** *(e.g. resolved, ongoing resolution, referred to agency, etc.)*
SECWEPEMC-GENERAL	Pre-Application/EA Draft	Loss of fishing areas and opportunities. There is a high level of uncertainty and risk by relying on ongoing effects and monitoring studies, as well as the preliminary (incomplete) results of Part B to establish a baseline condition and to determine residual effects on Secwepemc Title & Rights.	Fish populations are being impacted by changes in flow velocities, habitat suitability/availability, primary productivity, temperature changes, fish passage. Water is also being impacted by increased erosion and sedimentation, and loss of nutrients. Salmon have been extirpated and sturgeon are endangered. Community well being is also negatively impacted through the disconnection to the land in the LSA due to existing activities.	Magnitude – moderate Context – High sensitivity and low resilience Extent – RR, MCR, local, regional, OOS Duration – Permanent Reversibility – Irreversible Frequency- Frequent Likelihood – High Confidence - Low	Conduct a Secwepemc CHA for the LSA to better understand the level of impacts on Secwepemc Title and Rights. Expedite implementation of current mitigation strategies (e.g. fish entrainment, reservoir and stream fertilization, increased shoreline erosion control, etc…). Secure and purchase ecologically significant lands within the LSA for conservation, enhancement and stewardship activities. Soft operating constraints for the Middle Columbia River, Kinbasket Reservoir, and Arrow Lake need to be formalized. Fund Secwepemc community member's education for environmental programs to support Secwepemc involvement in the implementation of the above mitigation strategies. Fund and implement a Columbia Basin Cultural Heritage Management Board to address mitigation activities upstream of Nakusp. Complete within 3 years of the issues of the EA certificate, a compensation	Ongoing resolution required through bilateral agreements with Secwepemc Parties and BC Hydro.

Aboriginal Group	Consultation Stage / Information Source	Issue – Aboriginal Interest	Issue – Other Matters of Concern	Analysis of Potential Effect	Proposed Measures to Avoid, Mitigate or Otherwise Manage Effects	Status of Issue *(e.g. resolved, ongoing resolution, referred to agency, etc.)*
					agreement that fully addressed the non-mitigable impacts to non-archaeological cultural heritage resources impacted by operation of the Revelstoke 6 facility, including impacts to date and impacts reasonably foreseeable in the future.	
SECWEPEMC-GENERAL	Pre-Application/EA Draft	Loss of plant harvesting areas and opportunities. There is a high level of uncertainty and risk by relying on ongoing effects and monitoring studies, as well as the preliminary (incomplete) results of Part B to establish a baseline condition and to determine residual effects on Secwepemc Title & Rights.	The extent of noxious weed establishment in the project area and from Revelstoke 5 remains unknown. Other information that is poorly understood includes the distribution and abundance of rare plants in the LSA. Alteration of the hydrological regime and increased flow velocities due to the Revelstoke 6 project will promote further erosion of upland and riparian areas, which will result in further loss of vegetation. Community well being is also negatively impacted through the disconnection to the land in the LSA due to existing activities.	Magnitude – moderate Context – High sensitivity and low resilience Extent – RR, MCR, local, regional, OOS Duration – Permanent Reversibility – Irreversible Frequency- Frequent Likelihood – High Confidence - Low	Conduct a Secwepemc CHA for the LSA to better understand the level of impacts on Secwepemc Title and Rights. Expedite implementation of current mitigation strategies (e.g. fish entrainment, reservoir and stream fertilization, increased shoreline erosion control, etc…). Secure and purchase ecologically significant lands within the LSA for conservation, enhancement and stewardship activities. Soft operating constraints for the Middle Columbia River, Kinbasket Reservoir, and Arrow Lake need to be formalized. Fund Secwepemc community member's education for environmental programs to support Secwepemc involvement in the implementation of the above mitigation strategies. Fund and implement a Columbia Basin Cultural Heritage Management Board to address mitigation activities upstream of Nakusp.	Ongoing resolution required through bilateral agreements with Secwepemc Parties and BC Hydro.

Aboriginal Group	Consultation Stage / Information Source	Issue – Aboriginal Interest	Issue – Other Matters of Concern	Analysis of Potential Effect	Proposed Measures to Avoid, Mitigate or Otherwise Manage Effects	Status of Issue *(e.g. resolved, ongoing resolution, referred to agency, etc.)*
					Complete within 3 years of the issues of the EA certificate, a compensation agreement that fully addressed the non-mitigable impacts to non-archaeological cultural heritage resources impacted by operation of the Revelstoke 6 facility, including impacts to date and impacts reasonably foreseeable in the future.	
SECWEPEMC-GENERAL	Pre-Application/EA Draft	Loss of hunting areas and opportunities. There is a high level of uncertainty and risk by relying on ongoing effects and monitoring studies, as well as the preliminary (incomplete) results of Part B to establish a baseline condition and to determine residual effects on Secwepemc Title & Rights.	Loss of habitat (e.g. via inundation or erosion), has been identified as the primary driver in species impacts in the project area. The concepts of ecological and cultural thresholds need to be considered in this assessment. Information gaps related to potential project impacts on wildlife species include information for species at risk such as red-listed badger and grizzly bear. Community well being is also negatively impacted through the disconnection to the land in the LSA due to existing activities.	Magnitude – moderate Context – High sensitivity and low resilience Extent – RR, MCR, local, regional, OOS Duration – Permanent Reversibility – Irreversible Frequency- Frequent Likelihood – High Confidence - Low	Species specific management plans need to be developed to prevent adverse effects on local wildlife species (e.g. mountain goat, migratory birds) and to demonstrate that these species have been appropriately considered in order to avoid potential effects such as abandonment of important natal habitat, mortality or displacement. Conduct a Secwepemc CHA for the LSA to better understand the level of impacts on Secwepemc Title and Rights. Expedite implementation of current mitigation strategies (e.g. fish entrainment, reservoir and stream fertilization, increased shoreline erosion control, etc…). Secure and purchase ecologically significant lands within the LSA for conservation, enhancement and stewardship activities. Soft operating constraints for	Ongoing resolution required through bilateral agreements with Secwepemc Parties and BC Hydro.

Aboriginal Group	Consultation Stage / Information Source	Issue – Aboriginal Interest	Issue – Other Matters of Concern	Analysis of Potential Effect	Proposed Measures to Avoid, Mitigate or Otherwise Manage Effects	Status of Issue *(e.g. resolved, ongoing resolution, referred to agency, etc.)*
					the Middle Columbia River, Kinbasket Reservoir, and Arrow Lake need to be formalized. Fund Secwepemc community member's education for environmental programs to support Secwepemc involvement in the implementation of the above mitigation strategies. Fund and implement a Columbia Basin Cultural Heritage Management Board to address mitigation activities upstream of Nakusp. Complete within 3 years of the issues of the EA certificate, a compensation agreement that fully addressed the non-mitigable impacts to non-archaeological cultural heritage resources impacted by operation of the Revelstoke 6 facility, including impacts to date and impacts reasonably foreseeable in the future.	
SECWEPEMC-GENERAL	Pre-Application/EA Draft	Loss of medicine gathering sites and opportunities. There is a high level of uncertainty and risk by relying on ongoing effects and monitoring studies, as well as the preliminary (incomplete) results of Part B to establish	Additional field efforts need to be made within the project area to update noxious weed information and rare plant information within prescribed growing seasons (early to mid-growing season), as well as known medicinal	Magnitude – moderate Context – High sensitivity and low resilience Extent – RR, MCR, local, regional, OOS Duration – Permanent Reversibility – Irreversible Frequency- Frequent Likelihood – High	Conduct a Secwepemc CHA for the LSA to better understand the level of impacts on Secwepemc Title and Rights. Expedite implementation of current mitigation strategies (e.g. fish entrainment, reservoir and stream fertilization, increased shoreline erosion control, etc…). Secure and purchase ecologically significant lands	Ongoing resolution required through bilateral agreements with Secwepemc Parties and BC Hydro.

Aboriginal Group	Consultation Stage / Information Source	Issue – Aboriginal Interest	Issue – Other Matters of Concern	Analysis of Potential Effect	Proposed Measures to Avoid, Mitigate or Otherwise Manage Effects	Status of Issue *(e.g. resolved, ongoing resolution, referred to agency, etc.)*
		a baseline condition and to determine residual effects on Secwepemc Title & Rights.	gathering areas within the LSA. Community well being is also negatively impacted through the disconnection to the land in the LSA due to existing activities.	Confidence - Low	within the LSA for conservation, enhancement and stewardship activities. Soft operating constraints for the Middle Columbia River, Kinbasket Reservoir, and Arrow Lake need to be formalized. Fund Secwepemc community member's education for environmental programs to support Secwepemc involvement in the implementation of the above mitigation strategies. Fund and implement a Columbia Basin Cultural Heritage Management Board to address mitigation activities upstream of Nakusp. Complete within 3 years of the issues of the EA certificate, a compensation agreement that fully addressed the non-mitigable impacts to non-archaeological cultural heritage resources impacted by operation of the Revelstoke 6 facility, including impacts to date and impacts reasonably foreseeable in the future.	
SECWEPEMC-GENERAL	Pre-Application/EA Draft	Loss of spiritual/ceremonial sites and opportunities. There is a high level of uncertainty and risk by relying on ongoing effects and monitoring studies,	Spiritual areas represent the places to connect to the land and are foundations of Secwepemc culture. Community well being is also negatively impacted through the	Magnitude – outside of range of natural variation Context – High sensitivity and low resilience Extent – RR, MCR, local, regional, OOS Duration – Permanent Reversibility – Irreversible	Conduct a Secwepemc CHA for the LSA to better understand the level of impacts on Secwepemc Title and Rights. Expedite implementation of current mitigation strategies (e.g. fish entrainment, reservoir and stream fertilization, increased	Ongoing resolution required through bilateral agreements with Secwepemc Parties and BC Hydro.

Aboriginal Group	Consultation Stage / Information Source	Issue – Aboriginal Interest	Issue – Other Matters of Concern	Analysis of Potential Effect	Proposed Measures to Avoid, Mitigate or Otherwise Manage Effects	Status of Issue *(e.g. resolved, ongoing resolution, referred to agency, etc.)*
		as well as the preliminary (incomplete) results of Part B to establish a baseline condition and to determine residual effects on Secwepemc Title & Rights.	disconnection to the land in the LSA due to existing activities.	Frequency- Frequent Likelihood – High Confidence - Low	shoreline erosion control, etc…). Secure and purchase ecologically significant lands within the LSA for conservation, enhancement and stewardship activities. Soft operating constraints for the Middle Columbia River, Kinbasket Reservoir, and Arrow Lake need to be formalized. Fund Secwepemc community member's education for environmental programs to support Secwepemc involvement in the implementation of the above mitigation strategies. Fund and implement a Columbia Basin Cultural Heritage Management Board to address mitigation activities upstream of Nakusp. Complete within 3 years of the issues of the EA certificate, a compensation agreement that fully addressed the non-mitigable impacts to non-archaeological cultural heritage resources impacted by operation of the Revelstoke 6 facility, including impacts to date and impacts reasonably foreseeable in the future.	
SECWEPEMC-GENERAL	Pre-Application/EA Draft	Loss of habitat sites and opportunities. There is a high level of uncertainty and risk by relying on ongoing effects and	Community well being is also negatively impacted through the disconnection to the land in the LSA due	Magnitude – moderate Context – High sensitivity and low resilience Extent – RR, MCR, local, regional, OOS	Conduct a Secwepemc CHA for the LSA to better understand the level of impacts on Secwepemc Title and Rights. Expedite implementation of current	Ongoing resolution required through bilateral agreements with Secwepemc Parties and BC Hydro.

Aboriginal Group	Consultation Stage / Information Source	Issue – Aboriginal Interest	Issue – Other Matters of Concern	Analysis of Potential Effect	Proposed Measures to Avoid, Mitigate or Otherwise Manage Effects	Status of Issue *(e.g. resolved, ongoing resolution, referred to agency, etc.)*
		monitoring studies, as well as the preliminary (incomplete) results of Part B to establish a baseline condition and to determine residual effects on Secwepemc Title & Rights.	to existing activities.	Duration – Permanent Reversibility – Irreversible Frequency- Frequent Likelihood – High Confidence - Low	mitigation strategies (e.g. fish entrainment, reservoir and stream fertilization, increased shoreline erosion control, etc…). Secure and purchase ecologically significant lands within the LSA for conservation, enhancement and stewardship activities. Soft operating constraints for the Middle Columbia River, Kinbasket Reservoir, and Arrow Lake need to be formalized. Fund Secwepemc community member's education for environmental programs to support Secwepemc involvement in the implementation of the above mitigation strategies. Fund and implement a Columbia Basin Cultural Heritage Management Board to address mitigation activities upstream of Nakusp. Complete within 3 years of the issues of the EA certificate, a compensation agreement that fully addressed the non-mitigable impacts to non-archaeological cultural heritage resources impacted by operation of the Revelstoke 6 facility, including impacts to date and impacts reasonably foreseeable in the future.	
SECWEPEMC-GENERAL	Pre-Application/EA Draft	Measurable disturbance to or loss of		Magnitude – surface disturbance, subsurface disturbance, unauthorized	Immediately develop and implement a mitigation strategy to address impacts to	Ongoing resolution required through bilateral agreements with Secwepemc Parties and

Aboriginal Group	Consultation Stage / Information Source	Issue – Aboriginal Interest	Issue – Other Matters of Concern	Analysis of Potential Effect	Proposed Measures to Avoid, Mitigate or Otherwise Manage Effects	Status of Issue *(e.g. resolved, ongoing resolution, referred to agency, etc.)*
		archaeological sites. There is a high level of uncertainty and risk by relying on ongoing effects and monitoring studies, as well as the preliminary (incomplete) results of Part B to establish a baseline condition and to determine residual effects on Secwepemc Title & Rights.		collection, partial erosion, total erosion Context – High sensitivity and low resilience Extent – RR, MCR, OOS Duration – Permanent Reversibility – Irreversible Frequency- Frequent Likelihood – High Confidence - Low	known archaeological sites in Arrow, Revelstoke and Kinbasket Reservoirs. Complete, within 3 years of the issuance of the EA Certificate, a compensation agreement that fully addresses the non-mitigatable impacts to archaeological resources impacted by operations of the Revelstoke 6 facility in the Arrow, Revelstoke and Kinbasket Reservoirs, including impacts to date and impacts reasonably foreseeable in the future. Complete an inventory of 100% of modeled high (this needs to be defined elsewhere in this document – i.e. if we are only ranking as low or high, give rationale) archaeological potential in the LSA, and a representative sample of low archaeological potential. This includes landforms at risk of bank failure above the reservoir high pool. Expand the archaeological potential model to other reservoirs in Secwepemc Territory. Revisit archaeological sites where inventory is incomplete, and complete inventory. Biannual monitoring of effects on LSA archaeological	BC Hydro.

Aboriginal Group	Consultation Stage / Information Source	Issue – Aboriginal Interest	Issue – Other Matters of Concern	Analysis of Potential Effect	Proposed Measures to Avoid, Mitigate or Otherwise Manage Effects	Status of Issue *(e.g. resolved, ongoing resolution, referred to agency, etc.)*
					sites at low pool. Expand archaeological studies to determine whether effects of Revelstoke 6 impacts the Nakusp Narrows. Fund research regarding identification and investigation of intact sites above full pool. Develop and implement a culturally appropriate adaptive archaeological management plan, with involvement and training of community members to carry out this monitoring. Implement mitigation measures proposed in Part B Off Site compensation for losses to archaeological sites in the LSA (BCH to protect archaeological sites important to Secwepemc by purchasing land upon which sites are located. Fund community members' education for archaeology/anthropology programs.	
SECWEPEMC-GENERAL	Pre-Application/EA Draft	Loss of access to lands and resources. There is a high level of uncertainty and risk by relying on ongoing effects and monitoring studies, as well as the	With the advent of additional development and private land ownership, increased dangers and hazards exist where Secwepemc peoples	Magnitude – moderate Context – High sensitivity and low resilience Extent – RR, MCR, local, regional, OOS Duration – Permanent Reversibility – Irreversible	Conduct a Secwepemc CHA for the LSA to better understand the level of impacts on Secwepemc Title and Rights. Expedite implementation of current mitigation strategies (e.g. fish entrainment, reservoir and	Ongoing resolution required through bilateral agreements with Secwepemc Parties and BC Hydro.

Aboriginal Group	Consultation Stage / Information Source	Issue – Aboriginal Interest	Issue – Other Matters of Concern	Analysis of Potential Effect	Proposed Measures to Avoid, Mitigate or Otherwise Manage Effects	Status of Issue *(e.g. resolved, ongoing resolution, referred to agency, etc.)*
		preliminary (incomplete) results of Part B to establish a baseline condition and to determine residual effects on Secwepemc Title & Rights.	are either discouraged or even prohibited from accessing previously desirable areas for resource harvesting and resource management. .Community well being is also negatively impacted through the disconnection to the land in the LSA due to existing activities.	Frequency- Frequent Likelihood – High Confidence - Low	stream fertilization, increased shoreline erosion control, etc…). Secure and purchase ecologically significant lands within the LSA for conservation, enhancement and stewardship activities. Soft operating constraints for the Middle Columbia River, Kinbasket Reservoir, and Arrow Lake need to be formalized. Fund Secwepemc community member's education for environmental programs to support Secwepemc involvement in the implementation of the above mitigation strategies. Fund and implement a Columbia Basin Cultural Heritage Management Board to address mitigation activities upstream of Nakusp. Complete within 3 years of the issues of the EA certificate, a compensation agreement that fully addressed the non-mitigable impacts to non-archaeological cultural heritage resources impacted by operation of the Revelstoke 6 facility, including impacts to date and impacts reasonably foreseeable in the future.	
SECWEPEMC-GENERAL	Pre-Application/EA Draft	Loss of land and resource management opportunities. There is a high level of	Mass wastage of soils over time via soil creep has considerable implications on the	Magnitude – moderate Context – High sensitivity and low resilience Extent – RR, MCR, local,	Conduct a Secwepemc CHA for the LSA to better understand the level of impacts on Secwepemc Title and Rights. Expedite	Ongoing resolution required through bilateral agreements with Secwepemc Parties and BC Hydro.

Aboriginal Group	Consultation Stage / Information Source	Issue – Aboriginal Interest	Issue – Other Matters of Concern	Analysis of Potential Effect	Proposed Measures to Avoid, Mitigate or Otherwise Manage Effects	Status of Issue *(e.g. resolved, ongoing resolution, referred to agency, etc.)*
		uncertainty and risk by relying on ongoing effects and monitoring studies, as well as the preliminary (incomplete) results of Part B to establish a baseline condition and to determine residual effects on Secwepemc Title & Rights.	health and function of the aquatic and terrestrial communities that support Secwepemc resources. but the additional development and associated proposed operational activity is anticipated to contribute to the lessened ability for Secwepemc peoples to protect the holistic worldview and Secwepemc relationship to the land. Community well being is also negatively impacted through the disconnection to the land in the LSA due to existing activities.	regional, OOS Duration – Permanent Reversibility – Irreversible Frequency- Frequent Likelihood – High Confidence - Low	implementation of current mitigation strategies (e.g. fish entrainment, reservoir and stream fertilization, increased shoreline erosion control, etc…). Secure and purchase ecologically significant lands within the LSA for conservation, enhancement and stewardship activities. Soft operating constraints for the Middle Columbia River, Kinbasket Reservoir, and Arrow Lake need to be formalized. Fund Secwepemc community member's education for environmental programs to support Secwepemc involvement in the implementation of the above mitigation strategies. Fund and implement a Columbia Basin Cultural Heritage Management Board to address mitigation activities upstream of Nakusp. Complete within 3 years of the issues of the EA certificate, a compensation agreement that fully addressed the non-mitigable impacts to non-archaeological cultural heritage resources impacted by operation of the Revelstoke 6 facility, including impacts to date and impacts reasonably foreseeable in the future.	
SECWEPEMC-GENERAL	Pre-Application/EA	Cumulative Impacts on Secwepemc Title	Family structures, and the passing on of TEK	Magnitude – High Context – High sensitivity	Conduct a comprehensive cumulative effects assessment	Ongoing resolution required through bilateral agreements

Aboriginal Group	Consultation Stage / Information Source	Issue – Aboriginal Interest	Issue – Other Matters of Concern	Analysis of Potential Effect	Proposed Measures to Avoid, Mitigate or Otherwise Manage Effects	Status of Issue *(e.g. resolved, ongoing resolution, referred to agency, etc.)*
	Draft	and Rights. There is a high level of uncertainty and risk by relying on ongoing effects and monitoring studies, as well as the preliminary (incomplete) results of Part B to establish a baseline condition and to determine residual and cumulative effects on Secwepemc Title & Rights.	to children is negatively impacted with the continual infringement on important areas (e.g. traditional hunting, fishing and gathering sites). Community well being is also negatively impacted through the disconnection to the land in the LSA due to existing activities.	and low resilience Extent – RR, MCR, local, regional, OOS Duration – Permanent Reversibility – Irreversible Frequency- Frequent Likelihood – High Confidence - High	to better understand past, present, and future impacts on cultural and natural resources in the Upper Columbia River Basin. This assessment would include, but is not limited to, environmental, archaeology, cultural heritage, and socio-economic impacts. Develop and adaptive cultural and natural resource management programs. Key components of these programs would include the development of acceptable thresholds for resource management, development and prioritization of mitigation strategies, implementation of mitigation strategies, and effectiveness monitoring. Again, these programs would include, but are not limited to environmental, archaeology, cultural heritage, and socio-economic mitigation strategies. Conduct a Secwepemc CHA for the LSA to better understand the level of impacts on Secwepemc Title and Rights. Expedite implementation of current mitigation strategies (e.g. fish entrainment, reservoir and stream fertilization, increased shoreline erosion control, etc…). Secure and purchase ecologically significant lands within the LSA for	with Secwepemc Parties and BC Hydro.

Aboriginal Group	Consultation Stage / Information Source	Issue – Aboriginal Interest	Issue – Other Matters of Concern	Analysis of Potential Effect	Proposed Measures to Avoid, Mitigate or Otherwise Manage Effects	Status of Issue *(e.g. resolved, ongoing resolution, referred to agency, etc.)*
					conservation, enhancement and stewardship activities. Soft operating constraints for the Middle Columbia River, Kinbasket Reservoir, and Arrow Lake need to be formalized. Fund Secwepemc community member's education for environmental programs to support Secwepemc involvement in the implementation of the above mitigation strategies. Fund and implement a Columbia Basin Cultural Heritage Management Board to address mitigation activities upstream of Nakusp. Complete within 3 years of the issues of the EA certificate, a compensation agreement that fully addressed the non-mitigable impacts to non-archaeological cultural heritage resources impacted by operation of the Revelstoke 6 facility, including impacts to date and impacts reasonably foreseeable in the future.	

- For IBA discussion, need to consider an internal/external framework agreement on the common structure and content of the IBA; however, each Secwepemc Party will negotiate its own agreement subject to the common structure and content agreed to.

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APPENDIX F, MAPS REVIEWED FOR THIS REPORT

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APPENDIX G, SECWEPEMC CONCERNS AND RESPONSE LETTERS PROVIDED TO BC HYDRO

APPENDIX H, SECWEPEMC PLACE NAMES WITHIN THE LSA PROVIDED BY SPLATSIN

Secwepemc	Anglican	Translation	Source
Sxwnitkwa	Arrow Lakes		Casimir Felix
Sts'ek'kin	Revelstoke	connected	Francis Thomas
Stilthn	Selkirk Mountains	(mountain peaks)	Casimir Felix

Volume 4

Appendices

June, 2017

BC Hydro

C11 KTUNAXA DRAFT SUMMARY OF RECOMMENDED PROJECT MITIGATIONS AND MEASURES

See subsections C2, C3, C4, C5, C6, C7, and C8 for a discussion of Project effects that mitigations and measures in Table C11-1 are designed to address. Ktunaxa mitigations and measures are to be undertaken by BC Hydro as part of the Project, and are intended to reduce the impact of potential negative effects and increase the impact of potential positive effects for Ktunaxa Title, Rights and Interests. Findings regarding residual Project effects on Ktunaxa Title, Rights and Interests assume that all recommended measures and mitigations are undertaken and implemented fully and successfully. Mitigations and measures are based on knowledge and information at the time of writing, and may be refined as the Project EA progresses through the application review period. Ktunaxa mitigations and measures are provided with the following assumptions:

- Any recommended mitigations and measures not already agreed to by BC Hydro in existing agreements with KNC, and not included as conditions of the final Table of Conditions for the Revelstoke Generating Station Unit 6 Project Environmental Assessment Certificate, will be addressed through bilateral agreements between BC Hydro and Ktunaxa Nation Council (KNC), and will be monitored for effectiveness.
- The parties may decide to enter into a impact management and benefit agreement (IMBA) negotiations which may provide a framework for negotiating specific mitigations and measures related to hydro-electric impacts; however, in the absence of an executed agreement regarding mitigations and measures related to hydro-electric impacts, the KNC seeks mitigation measures to be secured in legally binding permits.
- Where information in section B of the application is limited, or inadequate for informing section C, a precautionary approach has been taken to anticipated effects and associated measures and mitigations.
- Existing or future voluntary tables or processes may achieve some the mitigations and measures. Recognition of conditions within Project permitting provides the KNC with an important mechanism for supporting reliability and accountability for future actions.
- This table (C11-1) shall in no way constrain the ability of Ktunaxa decision-makers regarding approval of the Project, or IMBA implementation.
- Funding of Ktunaxa participation in Project mitigations and measures, including monitoring, evaluating, and communicating performance, will be the responsibility of BC Hydro. Information collected by Ktunaxa Nation through participation will remain the property of the Ktunaxa Nation.

This table (C11-1) has not been reviewed by KNC and BC Hydro. Content, dates, and dollar amounts may be adjusted based on ongoing discussions between KNC and BC Hydro.

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Table C11-1: Ktunaxa Summary of Recommended Project Mitigations and Measures

KNC Sector	Impact Pathway(s)	KNC Recommended Measures and Mitigations
11.1 Water and Land Stewardship **C2** Water **C7** Lands and Resources **C3** TKL	*Project residual effect* on flow, especially in winter, resulting in increased peak inundation, velocity, and erosion in the MCR and increased variation in the RR; *Combined with (+)* cumulative (additive and synergistic) effects in combination with legacy effects from previous BC Hydro projects and operations (including ALR operations) on the MCR and RR; *Results in (➔)* increased impacts on water and aquatic resources in the RR, MCR and downstream; *Results in (➔)* Impacts on Ktunaxa title, rights and interests, including water stewardship, cultural practice (e.g. Salmon and sturgeon harvest), and transmission of	For the operational life of the Project, BC Hydro will support Ktunaxa stewardship of land and water in the Arrow Lakes and Columbia River, including Revelstoke Reservoir through undertaking the following: • Within two year of receiving an EAC BC Hydro will negotiate and seek to conclude an agreement with the KNC for full Ktunaxa partnership in the Fish and Wildlife Compensation Program and with respect to review of the implementation of the Columbia Water Use Plan and development of a Phase II Water Use Plan. • Within six months of receiving an EAC, BC Hydro will submit a proposed comprehensive monitoring, restoration and adaptive management plan for potential or anticipated Revelstoke 6 operational impacts on fish, aquatics and riparian areas with a particular focus on performance based measures and long-term management actions. The plan will be considered as part of a negotiated Columbia Water Use Plan (WUP) Phase II process or other future water use planning effort and will include: ○ Clear measurable objectives related to ecological productivity, which will be made available for KNC review prior to issuance of an EAC for the Project; ○ A focus on operational impacts of modified discharges on persistent White Sturgeon recruitment failure, primary and secondary productivity and fish habitat use; and ○ Funding provided for Ktunaxa participation in developing a WUP Phase 2 monitoring program relevant to the operational impacts of Revelstoke 6, as well as directly implementing monitoring and restoration studies. • BC Hydro will work with Ktunaxa experts to develop a comprehensive assessment of the operational impacts of the Revelstoke Generating station (Rev 6 and previous

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	knowledge	facilities) on anadromous Chinook and Sockeye Salmon spawning, rearing and migratory habitats (currently vacant), and the future potential ability of Ktunaxa to harvest salmon in the project area including the MCR and RR. Impacts of the project to these habitat areas will be characterized and minimized. BC Hydro will submit a plan for mitigation or offset of any residual effects that will be implemented prior to salmon restoration above Grand Coulee Dam. • Within six months of receiving an EAC, BC Hydro will convene an urgent evaluation (including high level BC Hydro project engineers with KNC representatives) of opportunities for mitigation of existing impacts to fish and fish habitat through modification of the Revelstoke 6 project design to be included in the definition of the Project or as a condition of the Project (e.g. alteration of water intake to moderate downstream conditions, restrictions on timing of operations, fish friendly turbines) • BC Hydro, in consultation with and supporting the KNC, will develop a thorough strategy for KNC and BC Hydro to include technical information gained from studies such as Water Use Planning and Reservoir Archaeology Program into ongoing operations that incorporate ecosystem function and protective measures for Ktunaxa title and rights including re-establishing seasonal flows on the Columbia and in the Arrow Lakes that more closely emulate natural or pre-development hydrologic conditions.
11.2 Water, Wild Foods and Confidence **C2** Water **C3** TKL **C6** Social Sector	Project residual effect on peak flow, resulting in increased peak inundation, velocity, and erosion in the MCR and RR; **+** Cumulative (additive and synergistic) effects in	BC Hydro will provide annual support of at least $X per annum (indexed annually to account for inflation) to Ktunaxa Nation Council for development and implementation of a plan for supporting confidence in water and wild food harvesting in Mi¢'qaqas ʔamakʔis. This will include additional work to understand existing barriers to Ktunaxa harvest in the Project area: ○ concerns regarding methyl mercury and other cultural contaminants; ○ concerns regarding access and navigation, including impact of erosion and

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C7 Lands and Resources	combination with legacy effects from previous BC Hydro projects and operations (including ALR operations) on the MCR and RR; *Results in (➔)* Reduced Ktunaxa confidence in accessing water and aquatic resources in the MCR and downstream; *Results in (➔)* Impacts on Ktunaxa title, rights and interests, including reduced opportunities for cultural practice, transmission of place specific knowledge, and harvest practices on the MCR.	deposition; ○ barriers to knowledge transmission in the MCR, RR and downstream; and ○ concerns regarding quantity of resources, sustainability and likely success (e.g. caribou, white sturgeon, kokanee). The plan will include: • A KNC directed cultural communication strategy involving trusted Ktunaxa experts to inform Ktunaxa citizens regarding opportunities for access, and the relative status of wild foods (including fish), water, and medicine, in the Mid-Columbia River Valley portions of Mi¢'qaqas ʔamakʔis, and designed to increase confidence, where warranted, based on scientific and Ktunaxa knowledge; and • A program to determine the effects of the Revelstoke 6 project on the future ability of Ktunaxa to citizens to access and harvest caribou, White Sturgeon and ocean-going salmon for food, social or ceremonial purposes when populations of these species recover to appropriate levels.
11.3 Cultural Transmission and Management **C3** TKL **C6** Social Sector	Project residual effect in peak flow, especially in winter including increased peak inundation, velocity, and erosion in the MCR and RR; **+** Cumulative (additive and synergistic) effects in combination with legacy	By XXXX 2018, BC Hydro will provide annual support of at least $X per annum (indexed annually to account for inflation) to KNC for the lifetime of the project to develop and implement a Revelstoke Dam and Reservoir Cultural Management Plan to be implemented during construction, operations, closure and reclamation. This process will include: • A joint working group to develop and implement the Cultural Management Plan to address cultural issues related to the Project.

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C7 Lands and Resources	effects from previous BC Hydro projects and operations (including ALR operations) on the MCR and RR; *Results in (➔)* Increased erosion of shorelines and riparian areas including archaeological and cultural properties; *Results in (➔)* Reduced Ktunaxa confidence in practicing rights (e.g. navigation, fishing) and fewer opportunities for transmitting knowledge on the MCR, RR and downstream; *Results in (➔)* Impacts on Ktunaxa title, rights and interests, including reduced cultural practice, reduced transmission of place specific knowledge, and reduced harvest practices on the MCR and RR.	• Clear measures for Ktunaxa efforts to document and safeguard knowledge and language related to ¢i¢qum wu'uis near Revelstoke, the MCR, and surrounding areas of Mi¢'qaqas ʔamakʔis, including documentation of Ktunaxa title and rights based on oral historical, archival, environmental, and potential archaeological work to identify, record, and protect remaining tangible and intangible Ktunaxa cultural heritage that has been damaged or eroded as a result of existing BC Hydro operations, or that will be further damaged or eroded through the extension of operations through the Project. This will include documentation and monitoring of culturally important locations, species, and other conditions necessary for Ktunaxa practice of title and rights in the area. • Establish appropriate protocols for Ktunaxa archaeological and cultural properties protection including chance finds, site identification and recording, and erosion protection in the Mid Columbia Valley portion of Mi¢'qaqas ʔamakʔis • Establish a KNC led program of culturally meaningful signage, digital education and outreach that recognizes Ktunaxa knowledge, history and language in the MCR area, supports use of Ktunaxa terms and place names in everyday practice, and results in products relevant to Ktunaxa citizens and broader audiences. • Enable other efforts geared to the protection and revitalization of Ktunaxa knowledge and language for future Ktunaxa generations in the Mid Columbia River Valley and adjacent portions of Mi¢'qaqas ʔamakʔis and resulting in lasting legacy benefits to the Ktunaxa Nation.
11.4 Stewardship	Project residual effect in peak	BC Hydro will provide initial funds of $X and reasonable and reliable annual support of at

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and Conservation **C3** TKL **C7** Lands and Resources	flow, especially in winter, including increased peak inundation, velocity, and erosion in the MCR; **+** Cumulative (additive and synergistic) effects in combination with legacy effects from previous BC Hydro projects and operations (including ALR operations) on the MCR; *Results in (➔)* Increased erosion of shorelines, riparian areas and habitats and associated impacts on water, aquatic resources and terrestrial resources and biodiversity in the MCR and downstream; *Results in (➔)* Impacts on Ktunaxa title, rights and interests, including stewardship of 'all living things', sense of place, and transmission of knowledge.	least $X per annum (indexed annually to account for inflation) for the lifetime of the Project to support ongoing Ktunaxa stewardship of Mi¢'qaqas ʔamakʔis (including conservation of aquatic and terrestrial biodiversity and possibly including an ongoing guardian monitoring program) with focus on the Project, the MCR and adjacent areas. • Within two years of receiving an EAC, in consultation with the KNC, BC Hydro will establish a Biodiversity Management Plan, Bird Management Plan, Invasive Plant Management Plan, Wildlife Mitigation Management Plan, Erosion Mitigation Plan, and Restoration and Stabilization Plan, or equivalent document(s).These will include Ktunaxa ecological knowledge and perspectives and seek to restore and improve biodiversity consistent with pre-development levels in areas most affected by the Project. These plans will include provisions for funding long-term KNC environmental monitoring, with attention to long-term KNC planning objectives and identification of triggers, beyond which BC Hydro and KNC management actions, including habitat offsetting at 3:1 ratio, or equivalent compensatory actions, are required. • Management plans should also evaluate the incremental impacts of Revelstoke 6 operations on the timing, frequency and duration of freeze/thaw cycles, ice formation, scouring, gouging and resulting changes in sheer stress and sheer strength of soils, on the seasonal availability, suitability and use of habitats by selected wildlife guilds • Biodiversity Management Plan will include specific mitigations for ungulates, carnivores and furbearers, herptiles and birds, which will: ○ Mitigate and/or offset adverse impacts to support net positive impact on populations and habitats;

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		○ Ensure adaptive management through monitoring and evaluation. ● Funding for KNC to research impacts to terrestrial wildlife and vegetation related to management of flows on the MCR, ALR and RR. ● Maintain a Revelstoke Generating Station bear aware program to avoid attractants in the Project area.
11.5 Accounting of value of resources extracted and rights-based economy **C4** Economic Investment	Project use and occupation of valuable water resources within Ktunaxa ʔamakʔis; **+** Cumulative (additive and synergistic) effects, including ongoing Ktunaxa exclusion from benefits of previous BC Hydro projects and operations; *Results in (➔)* erosion or displacement of current and future Ktunaxa economic options and potential; *Results in (➔)* continuation of colonial effects and inequities related to lack of recognition of Ktunaxa rights and title.	BC Hydro will work with KNC to provide an accounting of revenues generated by BC Hydro operations in Ktunaxa ʔamakʔis: ● Without limiting the Rights of Ktunaxa Nation, this EA and the life of the project including all associated opportunities and contributing projects will be tied to any future agreement between Ktunaxa Nation and BC Hydro; ● Within six months of EA certification, BC Hydro will provide a full account (to the extent possible) of past net revenues that BC Hydro has received from Revelstoke operations and from all BC Hydro projects within Ktunaxa ʔamakʔis. This may be provided as a percentage of annual BC Hydro net revenues attributable to generation at Revelstoke, and Ktunaxa ʔamakʔis as a whole, or other jointly agreed upon form; ● BC Hydro will continue to update KNC on an annual basis with best available information regarding the amount of resource value (net revenues) from Revelstoke operations, and as a result of the Project, and as a result of other BC Hydro projects within Ktunaxa ʔamakʔis to support KNC efforts to receive a share of the revenues collected from BC from hydro-electric activity in Ktunaxa ʔamakʔis; ● Within three months of receiving a written request from KNC, BC Hydro will fund and participate in discussions with the province of BC and KNC regarding the sharing of revenue collected by the province of BC from hydro-electric activity in Ktunaxa ʔamakʔis, and;

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		• Within six months of EA certification, BC Hydro and KNC will jointly develop a revenue sharing model that is consistent with the economic component of Ktunaxa Rights and Title, including water. ○ The model will include a formula that will be used to provide revenue sharing for the life time of the project. The revenue shares will be used to ensure continuity of the task group and communication regarding, but not limited to capacity building initiatives, development planning and/or investment, and; ○ The revenue sharing model could be associated with the completion and signing of the KNC/BC Hydro Relationship Agreement.
11.6 Procurement Pre-qualification **C4** Economic Investment - Business Development	Experience with BC Hydro projects and current BC Hydro policies to date indicate a high risk that Ktunaxa businesses will be excluded from the economic benefits of the project.	BC Hydro will support a jointly developed framework that will outline procurement opportunities, business development and implementation between KNC and BCH for the life of the project. This will include: • Within one year of issuance of the EAC, BC Hydro facilitate the mutual development of the terms Direct Award, Set-asides and Preferred Contractor; • At least one month prior to issuance of RFQs or other procurement documents for Project pre-construction, construction, or other Project activities, BC Hydro will develop and agree on pre-qualification conditions; • Involvement of Ktunaxa businesses will be embedded as criteria for award of all contracts work awarded throughout the life of the project; • BC Hydro to support the use and development of pre-qualified Ktunaxa contractors for Environmental and Reclamation work and to provide continued direct award contracts throughout the life of the project, and; • KNC will provide BCH a Ktunaxa Nation Business Directory and Vendors list on a monthly basis.

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11.7 Procurement Communication **C4** Economic Investment - Business Development	Experience with BC Hydro projects and current BC Hydro policies to date indicates a high risk that Ktunaxa businesses will be excluded from the economic benefits of the project.	Facilitate Ktunaxa business development and access to contracting opportunities: • Appoint a joint task group (PTG) that will take responsibility for developing all mechanisms and models to support procurement opportunities; • Develop in conjunction with BCH forecasting models that provide specific information on 5 year, 3 year and 1 year actuals; • BCH will communicate with KNC contract and procurement opportunities that involves participation within agreed upon notice period (e.g., 30 days); • BCH will conduct with Ktunaxa regular procurement workshops to discuss procurement opportunities before they go to open tender, and; • Negotiate and agree on annual funding to be provided by BCH during the construction phase of the project to the Ktunaxa Business Development Fund; this will align with Ktunaxa Nation Economic Development and Investment Sectors mandate which assists with capacity building, development planning and/or investment.
11.8 Procurement C4 Economic Investment - Business Development	Experience with BC Hydro projects and current BC Hydro policies to date indicate a high risk that Ktunaxa businesses will be excluded from the economic benefits of the project.	BC Hydro will engage directly with KNC procurement personnel to expand contracting opportunities with Ktunaxa businesses: • Arrange for BC Hydro procurement personnel to take cross-cultural training as requested by Ktunaxa (cross reference Education and Employment mitigations); • Create a process to identify, explore and implement unbundling opportunities; • Aboriginal procurement policy will acknowledge the local affected First Nations within the shared territory, and; • Ongoing procurement monitoring is needed for successful access by KNC businesses to direct awards and competitive tenders, and preference measures need to escalate if there is a lack of substantive success (i.e., Ktunaxa businesses

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		actually getting contracts). ○ BC Hydro will work with Ktunaxa to track and report on Ktunaxa application success failure rate and retention. This will include tracking and reporting on those that have not been successful in securing procurement opportunities in order to assist Ktunaxa and BC Hydro in identifying any barriers and challenges.
11.9 Transportation and Housing Social **C5** Education and Employment **C6** Social	The project is anticipated to impact on the availability and cost of housing in the Revelstoke area. This has previously been a barrier to employment for Ktunaxa citizens.	BC Hydro will work with the KNC to identify and fund potential transportation and housing opportunities to improve service for Ktunaxa citizens employed by BC Hydro through the Project, including: • Setting aside of affordable housing for Ktunaxa members that are directly or indirectly employed by the Project and covering housing costs for the first 2 weeks until wages are flowing and able to meet costs. • Transportation costs to the site as well as one return trip to overcome initial barriers associated with unemployment and poverty; and to support travel to gather personal items and make any additional arrangements with family and home community.
11.10 Education and Training **C5** Education and Employment	Absent mitigation, Project impacts on Ktunaxa education and training can be expected to be negative and of low magnitude, as the Project would likely continue the pattern set by previous BC Hydro projects and maintain or intensify	BC Hydro will continue engagement with KNC in strategic planning for education and training and will have the following in place within six months of receiving a EA certificate, and ideally at least two years prior to initiating Project construction: • Implementation of an annual contribution to a Training Resources Fund which will be used to upskill Ktunaxa members currently in semi and low skilled jobs and therefore are ineligible for other government training funds. • Recognition of non-formal education and training as equivalent to educational requirements for mature workers with extensive workplace experience.

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	economic disparities between Ktunaxa and non-Ktunaxa in the region.	• Establishment of an equipment fund for Ktunaxa hires to ensure they have appropriate tools and work clothes equal to BC Hydro employees and for participants in training and mentoring programs. • Accommodation of interrupted employment histories and requirements waived in recognition of the cultural context for seasonal employment. • Funding of a Ktunaxa education and employment staff positions (FTE) to support the project and Ktunaxa hires.
11.11 Employment – Targets, access and Workplace Culture and Work Environment **C5** Education and Employment	To date there has been limited success in engaging Ktunaxa citizens in employment in BC Hydro projects. BC Hydro policies to date indicate a high risk that Ktunaxa citizens and businesses will be excluded from the economic benefits of the project.	BC Hydro will, at the direction of the KNC: • Set direct Project employment targets at 10 permanent FTE's per project year; minimum targets and protocols will be communicated to site level for implementation and monitored to ensure effectiveness. If target is not achieved, an amount equal to the annual salary of the shortfall positions will be provided to the KNC for support of training and education. • Provide regular reporting on hire targets; additional modifications will be implemented to address barriers. • Establish a process to allow for identification of Ktunaxa applications, including consideration of employment barriers and commitment to seek and support resources or other accommodation solutions to the barriers. • Provision of thorough feedback to the applicants who are not hired including provision of a written list of requirements and recommendations for reconsideration and referral to the KNC-EE Employment Support Worker to potentially access training funds supplied by BCH through these mitigations. • BC Hydro will, in conjunction with the Ktunaxa, establish a program to improve the work culture and support retention and advancement of Ktunaxa workers. This

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		program will: • Ensure appropriate, clear and adequate orientation for Ktunaxa citizens new to job site, including clear identification of the KNC-EE support position and the BC Hydro employee responsible for direct supervision and protocols for issues such as discrimination, bullying or racism.
11.12 Socio-economic and Procurement Monitoring **C5** Education and Employment **C6** Social	Monitoring and implementation	BC Hydro will make best efforts to collaboratively develop with the KNC a Socio-economic and procurement monitoring and management plan for BC Hydro operations. The plan will include: • A “check in” program with Ktunaxa workers at BCH job sites • Adequate and accessible resources to support Ktunaxa employees and families which may support cultural connections or socio-economic issues that if overcame would support job retention. • Ongoing monitoring of access by KNC businesses to direct awards and competitive tenders, with escalation of preference measures if there is a lack of substantive success (i.e., Ktunaxa businesses actually getting contracts). • BC Hydro will work with Ktunaxa to track and report on Ktunaxa application success and retention. This will include tracking and reporting on those that have not been successful in securing procurement or employment opportunities in order to assist Ktunaxa and BC Hydro in identifying any barriers and challenges.

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DRAFT FOR DISCUSSION PURPOSES ONLY

April 13th, 2017

Jim Scouris

6911 Southpoint Drive

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RE: Recommended Mitigations for BC Hydro's Rev6 Project EA

These comments are provided without prejudice and are confidential between the Okanagan Nation Rev6 Project Review Committee (OPRC) and BC Hydro. These comments are initial and have not yet been vetted or approved by the OPRC's technical working groups and shall not be considered final or exhaustive. These mitigation recommendations are designed to highlight some of the Rev6 project-specific actions that could serve to partially mitigate, offset and/or monitor project-specific effects on the rights and interests of the Okanagan Nation and its' members and are provided with rationale that will be useful in meetings and negotiations between the parties. The mitigation recommendations enclosed have not yet been evaluated, monetized or ranked in order of importance by the OPRC. They are not comprehensive or exclusive and the OPRC reserves the right to update them as more information comes forward on likely effects and good environmental management practices. Upon agreement of which measures are to be adopted by BC Hydro, residual effects on Okanagan rights and interests can be characterized.

Introduction and Overview

This memorandum provides initial and without prejudice recommended mitigations and monitoring measures for BC Hydro's Revelstoke 6 Dam Project ("Rev6") environmental assessment ("EA") on behalf of the Okanagan Project Review Committee ("OPRC" or "Committee"), a committee made up of staff and leadership representatives from the Okanagan Indian Band ("OKIB"), Westbank First Nation ("WFN"), Penticton Indian Band ("PIB") and the Okanagan Nation Alliance ("ONA"). These recommendations will be discussed in meetings between the PRC and BC Hydro technical teams (date TBD).

At this time, the OPRC has completed a preliminary effects assessment of Rev6 on the proponent and community-identified VCs. Substantial information gaps in the Proponent's Part B materials have made it challenging to complete a fulsome effects assessment, and thus to determine exactly what mitigations might be most appropriate.

While specific effects characterization and significance estimations may only be defined in a preliminary manner, the Okanagan Nation ("ON") is strongly aware of being dramatically affected by BC Hydro activities. The Okanagan Nation has been forced to spend 30 years in imposed "conservation mode" without any mitigation or compensation from BC Hydro for this loss. By way of example, BC Hydro must recognize that conservation activities must allow for fishing of preferred species for Okanagan members, as a Constitutionally-protected right. This impact on Okanagan members occurred due to a series of decisions that were made *without First Nations consultation* and that the Okanagan Nation has never been compensated or mitigated for. This is just one example of the multitude of priority Okanagan rights to lands, waters and resources, which have been infringed by BC Hydro actions and structures to date. Mitigation and monitoring measures must be adopted that deal with both Project-specific and underlying cumulative effects context, in order for infringement levels to be reduced to acceptable levels, as part of a reconciliation pathway between the parties.

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For the purposes of engaging with BC Hydro in defining appropriate mitigation and monitoring measures, OPRC has conducted research on mitigations that have been used in similar kinds of Projects in relation to Okanagan Nation priority valued components (VCs). These priority VCs are:

1. Water;
2. Fish and Fishing;
3. Okanagan Culture;
4. Community Well-being;
5. Livelihoods and Economy.

Several mitigations are identified for each VC and are outlined below. In some cases, mitigations in one section will overlap and/or link to mitigations recommended in other sections.

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i. GENERAL AND CROSS-CUTTING MITIGATION, MONITORING AND COMPENSATORY MEASURES

i.i. **BC Hydro to provide adequate capacity for Okanagan Nation member bands to have meaningful involvement in the development of environmental management plans** to ensure the Nation's concerns are incorporated into the construction and operational aspects of the Project and have Okanagan Nation involvement in any environmental or archaeological monitoring activities in order to build capacity. This includes involving the Okanagan Nation in carrying out and monitoring any and all construction, operations and clean-up in Syilx territory and adopting requirements for pre-, during and post-construction Syilx community environmental monitoring at all Project-related physical works and activities.

1. HEALTHY WATER

First and foremost, Syilx Nation water rights policy states that we have never surrendered, relinquished or extinguished these rights in any way for the water that flows through Syilx lands. In essence, the Syilx Nation does not recognize that the Province of British Columbia asserts ownership and control over all waters in Syilx territory. It is here we identify preliminary Okanagan recommended measures re: water,

to protect and manage the use of water in a way more in compliance with Okanagan water values, laws and norms (or guiding principles). We look forward to further discussion with BC Hydro on the adoption of these measures; completion of the Part C assessment by Okanagan Nation will not be complete until we understand which of them have been committed to by BC Hydro, after which a revised assessment of residual effects can occur.

Note: This section has yet to be revised and refined by ONA Natural Resources and Fisheries staff.

RECOGNITION OF AND PROMOTION OF SYILX WATER RIGHTS

1.1. Recognition of Syilx siwɬkʷ rights and responsibilities and BC Hydro and Provincial commitment to put Syilx at the forefront of all siwɬkʷ planning, siwɬkʷ protection, and siwɬkʷ operational processes, including decisions on allocation and generation.

SUPPORT FOR OKANAGAN WATER and WETLAND MONITORING

1.2. Train and fund positions for two Okanagan Nation water monitoring positions: ON will develop job descriptions and salaries for two OKIB monitors to support in the implementation of the Water Monitoring Program. The Proponent will fund at least one of these monitors to be trained in water quality monitoring and management.

1.3. Collaboratively develop Water and Wetlands Monitoring and Management Program: The Proponent will develop and implement a Water Monitoring and Management Program in collaboration with ON. The Plan will include provisions to hire and fund an Okanagan monitor position that will be responsible to monitor the following for the lifetime of the project:

a) downstream water quality and quantity (flow and velocity);
b) water quality of the reservoir; and,
c) quantity and quality in relation to drinking water guidelines.

In addition the Program will include the following measures:

a) develop and implement restoration plans to mimic natural disturbance (e.g. seasonal hydrological flows);

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b) stabilize river banks to reduce erosion impacts on ecological systems, including (but not limited to) revegetating river bank adjacent to Big Eddy Side Channel; and

c) include basic procedures (e.g. no fuel storage or fueling within 500m of waterways or wetlands).

d) Request funds to develop an overarching policy that takes guidance from the water declaration. BC Hydro must adhere to the Okanagan water strategy.

Rationale: ON has previously asked for a commitment from BCH to monitor the region for the lifetime of the dam.

1.4. Train and fund positions for two Okanagan Nation wetland monitoring positions: ON will develop job descriptions and salaries for two ON monitors to support in the implementation of the Wetlands Management Plan. The Proponent will fund at least one of these monitors to be trained in wetland monitoring and management. Note, this may be combined with the positions discussed in 1.1. above.

1.5. Improve the dam operations for the management of water velocity and seasonal fluctuations.

a) Change operations from a daily hydro-peaking to a seasonal hydro graph (natural freshet cycle). Benefits of a natural hydrograph will have greater benefits to the whole aquatic, wetland and terrestrial ecosystem downstream.

b) Co-management with Hugh Keenleyside Dam and Arrow Reservoir to target Arrow reservoir levels that would be positive to the riparian and wetland ecosystem in the Mid-Columbia River (Revelstoke Dam to Beaton Flats)

c) Risks of water velocity on culturally important species are currently unknown or under-examined. Ensure this information is gathered and analyzed. Develop appropriate mitigation once this is determined. Rationale: This is understood by ON to be an impact on culturally important species and needs to be addressed.

HABITAT COMPENSATION, RESTORATION AND MONITORING

1.6. Develop and implement a Wetlands Management Plan: The Proponent will develop and implement a Wetlands Management Plan. The Plan will meet the objective of no net loss in

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wetland function, and in a manner consistent with the Federal Policy on Wetland Conservation (Canadian Wildlife Service), but allows for Okanagan traditional knowledge and use information to define wetland functionality. The Plan will contain the following measures:

a) basic procedures (e.g. no fuel storage or fueling within 500m of waterways or wetlands);
b) pre-construction surveys for wetlands to collect site-specific information on wetland location, type, and function;
c) post-construction monitoring to confirm whether residual loss of function occurs;
d) if, following five years of post-construction monitoring, loss of function is confirmed, the Proponent must prepare the necessary compensation plans to meet a no net loss target defined in the Federal Policy for Wetland Conservation;
e) the Wetlands Management Plan must be developed in consultation with provincial and federal governments on policy and permitting requirements;
f) the Plan must be submitted to EAO for review at least 90 days prior to construction and approved by EAO; and,
g) Integrate Syilx traditional knowledge and perspectives on wetlands management.

1.7. **Develop culturally-appropriate wetland monitoring measures:** Proponent to commit to include ON in the development of criteria for designing a construction wetland monitoring program [if not amenable to an entire program, simply agree on criteria for evaluating post-monitoring data]. ON will specifically provide information on traditional knowledge and use, notably regarding definition of wetland "full functionality". If monitoring results show that functionality is not recovered, clear reporting steps need to be developed that would notify ON and Environment Canada and Climate Change.

1.8. **Develop an Aquatic Habitat Restoration Plan:** The Proponent will develop and implement an Aquatic Habitat Restoration Management Plan. The Plan will meet the following objectives in a manner consistent with Okanagan Indigenous Knowledge:

a) re-introduction of native plants, medicines and historical grasses, erosion protection;
b) erosion protection;
c) re-introduction of fish, especially salmon (see fish section);

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d) preserve natural habitat, such as in-stream logs and woody debris; and,

e) recreation sites along the river, including benches in appropriate locations.

EROSION-RELATED MITIGATION AND MONITORING

1.9. Follow-up and monitoring of peaking operation instantaneous discharge effect on bed and bank erosion, freeze-thaw, and water quality to quantify and characterise impact since it appears that predicted and realised impacts from Unit 5 are not well correlated.

1.10. Follow-up and monitoring fine sediment erosion / deposition processes to confirm Unit 6 is expected to result in minor changes to channel scour and to confirm zone of influence.

1.11. Protect bed and/or bank in river stretches identified as having continued, increased, or new channel stability concerns. Techniques include armouring and upgrade of existing riprap, use of woody debris and engineered log structures.

1.12. Areas expected to have increased erosion potential, due to increased shear stress or water level fluctuation near unstable banks, should apply successional reclamation and biotechnical slope stabilization to prevent or limit erosion. Reclamation goal should be to encourage native plant community establishment, including presence and abundance of cultural and medicinal use plants

CUMULATIVE EFFECTS ASSESSMENT AND MANAGEMENT

1.13. **BC Hydro to provide funding for a regional cumulative effects assessment** on water and aquatic ecosystems in the Revelstoke Lake to Arrow Lakes watershed corridor, focused on measureable parameters agreed to in consultation with affected First Nations[1]. Multiple climate change water availability scenarios need to be considered in any cumulative effects assessment management

[1] This part is absolutely critical given the lack of data; so also, is the need for more compensatory/offsetting programs, but not until such time as the total cumulative effects loading on ecosystems can be characterized.

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program; including estimation of the minimum water requirements for healthy distribution of ecotypes and species in the CRB.

1.14. **BC Hydro support for Okanagan cumulative effects study in the Revelstoke and Upper Arrow watersheds, as well as the capacitor station location.** Given the multiple factors causing cumulative effects on Okanagan rights and interests in the Project-affected area, including multiple BC Hydro facilities and activities, the Crown corporation should fund a cumulative effects study, developed in partnership with Okanagan Nation, for the Revelstoke and Upper Arrow watersheds, as well as the capacitor station site, across multiple VCs and indicators. Only then can the total impacts on traditional land and resource use including impacts to water, water crossing, habitat and vegetation in the Revelstoke and Upper Arrow watersheds, loss of cultural and spiritual enjoyment, impacts to hunting areas within the Revelstoke and Upper Arrow watersheds; be estimated, and fuel longer-term and appropriate response strategies.

Okanagan Nation does not have access to adequate information on pre-dam baseline conditions in the CRB. This is one of the reasons we are calling for a full cumulative effects assessment for the CRB, including reconstruction of a pre-industrial ecological conditions set, and associated detailed traditional use and traditional knowledge study with the Okanagan focused on the effects of cumulative change of dams in the Hydro Era on Okanagan water values, indicators and rights.

1.15. Given extensive habitat losses for wildlife as a result of inundation (Utzig and Schmidt 2011), there is a critical need to do **studies to re-establish pre-dam habitat quality** so that a reasonable set of habitat compensation requirements can be set up.

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2. FISH and FISHING

Here we identify preliminary Okanagan recommended measures re: fish and fishing. We look forward to further discussion with BC Hydro on the adoption of these measures; completion of the Part C assessment by Okanagan Nation will not be complete until we understand which of them have been committed to by BC Hydro, after which a revised assessment of residual effects can occur.

Note: This section has yet to be revised and refined by ONA Natural Resources and Fisheries staff.

Initial Fish and Fishing Impact Mitigation, Monitoring and Offset Recommendations

To support the maintenance and enhancement of fish and fish habitat conditions in the Columbia River Basin, *the following recommendations are provided without prejudice for consultation purposes with BC Hydro.*

2.1. Develop and implement a fish passage restoration plan: Fish passage for all species of importance to the ON (not just salmon) needs to be restored at the Revelstoke Dam site. Revelstoke 6 cannot inhibit upstream or downstream restoration activities of any fish species. Proper two-way fish passage at Revelstoke dam must be developed appropriate to the peaking facility that mimics a natural hydrograph and is seasonal in operations. Water quality must also be managed appropriately in relation to turbidity and temperature (see below measure regarding Sturgeon and temperature).

2.2. Life of Project Fish Monitoring Program Enhancements: With the involvement of Okanagan Nation.

a) Revelstoke Reservoir: Monitoring for life of project is recommended in Revelstoke Reservoir to determine:
   - Effects of reservoir fluctuations on littoral primary production, abundance and distribution of macrophytes, and fish stranding risk;
   - Effects of increased discharge on pelagic production and reservoir fish populations;
   - Effects of increased discharge on kokanee and other fish entrainment rates (that could affect reservoir fish populations).

b) Mid-Columbia River: Monitoring for life of project is recommended in the Mid-Columbia River, downstream of Revelstoke Dam to determine:
   - Effects of operating six units at REV on total dissolved gases;
   - Effects of change in flow regime on sturgeon spawning and recruitment;
   - Effects of change in flow regime on primary and secondary production;

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- Effects of change in flow regime on channel velocities, scour and geomorphic processes, and fish habitat suitability;
- Effects of change in flow regime on fish stranding.

2.3. Develop and implement an Environmental Management Plan: In direct engagement with First Nations, develop an Environmental Management Plan that includes the following measures for fish (wildlife measures are discussed in the Livelihoods & Economy section below):

a) develop measures appropriate for protecting federally and provincially listed species (e.g. white sturgeon, bull trout, kokanee, etc.)
b) protect and enhance fish habitat, including (but not limited to) (i) creating and enhancing stream conditions for sturgeon spawning[2], (ii) access management measures to conserve fish habitat, etc.

2.4. Develop a fish and fish habitat community research partnership: Fund and hire a fish and fish habitat restoration expert using recent trend data (up to and including data from the last 12 months) and up-to-date modelling to consider the following for the life of the dam:

1. water flow, velocity, quality, temperature, and turbidity;
2. egg to fry survival;
3. fry to smolt survival;
4. competing populations;
5. predator populations;
6. noise; and,
7. enumerate key fish stocks (distribution, abundance, and returns);
8. fluvial geomorphology.

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2 Sturgeon is a culturally important species that BC Hydro is already working on for recovery. While the areas on the Columbia below the Hugh Keenlyside dam are doing well, conditions in the Arrow Lakes area are far worse (e.g. ONA only caught 8 this year). The single spawning area near the golf course is not reaching the appropriate temperature to trigger spawning. Measures need to be added to ensure temperatures are improved.

2.5. **Fund Okanagan-commissioned studies involving Elders and traditional land and resource users to study cumulative change of the aforementioned values to contribute to the research program**, including fishing behaviour factors, such as sense of security and avoidance of use. Fund and support bi-annual community meetings with ON to review monitoring results and communicate how BC Hydro is responding to any ON concerns, with newsletters and community directed updates provided by the Proponent.

Rationale: ON members have cultural right to fish in the area for preferred species, but ON members cannot fish from Illiciliewat area to the dam. And any opportunities to fish near the dam causes safety risks. These safety issues associated with fluctuating water levels, among other reasons not yet fully understood, cause ON harvesters to avoid the area, deterring cultural use of the area and its surroundings.

2.6. **Develop a pre-industrial baseline:** Fund a research project to develop pre-industrial baseline pre-Revelstoke dam to better understand impacts on ON rights and interests, focused on wildlife and fish, water conditions, habitat, and practice of rights to support ongoing negotiations between ON and BC Hydro.

2.7. **Develop measures to enhance economic and food security outcomes:** Create a culturally-relevant country food harvesting and consumption monitoring program for community to implement and manage with a Proponent-funded expert. Fish tissue quality will be monitored using agreed-upon sampling protocols and laboratory analysis. ON will be involved in all aspects of the program including youth and Elder involvement, and results reported to the community-at-large, including final reports with raw monitoring results. Monitoring will compare against ON-defined consumption rates designed to achieve ON food security goals. At the same time, develop and/or enhance alternative economic options for food security, including lake stocking, harvesting, and freshwater or on-land aquaculture opportunities.

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3. *OKANAGAN CULTURE*

Initial Cultural Impact Mitigation, Monitoring and Offset Recommendations

The following recommendations are provided without prejudice for consultation purposes with BC Hydro. Given the widespread nature of cultural loss for the Okanagan, both site-specific and culture group level protections may be required. As with other mitigation measures, cultural mitigation should focus on altering the triggers of adverse change so that valued cultural resources are, at a minimum not eroded further and, in cases like this where there is evidence of pre-existing significant adverse cumulative effects on culture, actual net gains (enhancement/improvement) of cultural continuity factors occurs.

GENERAL OKANAGAN NATION EXPECTATIONS RE: CULTURAL IMPACT MITIGATION

For cultural impact mitigation to be considered effective, it should:

- **Prioritize avoidance,** through targeting the causes of impacts first and foremost, whenever possible
- **Consider all possible alternatives** prior to being adopted as the best choice, with the criteria used to make the decision readily apparent and defensible
- **Include culture holders as partners** in identification of appropriate mitigation, implementation, monitoring and feedback
- **Be transparent and specific** (i.e. everyone agrees what must be done), adequately funded, enforceable within the regulatory system and adaptive to changing conditions
- **Be adequately funded, resourced and staffed** to ensure proper implementation to meet specific established goals
- **Be precautionary** – wherever outcomes are uncertain, additional cost-effective precaution (e.g., creating 100 metre buffer zones between known or suspected archaeological sites and development activities rather than the legally required 30 metres)
- **Deal with impacts regardless of where they may be located** – the home community, the physical development location, or the work site culture.
- **Have outcomes that are measurable against goals.**

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- **Be adaptable** - mitigation commitments should be redefined as necessary as the development and relations between parties mature, and when potential impacts emerge via monitoring.

SITE SPECIFIC CULTURAL IMPACT MANAGEMENT RECOMMENDATIONS

Site-specific cultural protection programs may include but will not be limited to:

3.1. **Develop and fund an Elder's Action Committee for managing ancestors:** With ON, BC Hydro to develop plan to identify all burial sites in the MCR, and to protect and respectfully manage the burial sites identified during clearing activities in the inundated area, due to exposure by erosion over time, or as a result of increased impacts in other areas due to project activities (e.g., quarries, road movement, and other required physical works and activities).

3.2. **Develop, implement, and fund a guardian archaeology watchmen program:** The program will include provisions to hire and fund year-round Okanagan guardian watchmen positions that will be responsible to monitor and manage erosion and other effects on archaeological, cultural, and heritage resources for the life of the project. Okanagan Nation requires a grassroots, culturally appropriate model to ensure archaeological sites are protected if they are unearthed for the life of the dam, including inevitable decommissioning. Measures will include:

a) Regular reporting to community;
b) Conduct archaeological investigations of areas selected by Okanagan members to have high potential during pre-construction period;
c) Introduce ceremony inclusive of construction workers prior to initial construction;
d) Funding and support for repatriation activities in coordination with neighbouring nations, housing remains as close as possible to original site;
e) Develop guidelines for protecting archaeological resources;
f) Increase funding and extend program time period for watchmen to monitor area after every BC Hydro drawdown for the full period of the drawdown;
g) Fund a position for an Elder and an educator to provide information to BC Hydro workers, and bring message to nearby communities; and

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h) Include a clearly-defined mechanism in the chance find procedure to empower the guardian watchmen to (i) halt construction operations for up to one day with immediate notification to OKIB Territorial Stewardship Department, WFN Title and Rights Department, PIB Natural Resources Department and ONA Natural Resources Department and BC Hydro to define mutually agreeable path forward, (ii) ensure proper confidentiality protocols are in place to ensure construction crew will not disclose information about the site and include strong, enforcement (e.g. if disclosed, will lose job).

Rationale: This is especially important for human remains, which require special protocols and ceremony for handling. Artifacts and remains must be protected from damage and looters and must be treated with respect that is appropriate to our people. This measure is critical since there has been insufficient work completed to determine where the sites are, yet we know this area is rich (e.g. in 2016, 24 new sites were identified). Furthermore, ON was *never* given the opportunity to develop mitigations for previous projects (e.g. Rev5) and has experienced substantial loss and trauma that continues today.

3.3. Stabilize water levels to reduce exposure of sites: Decision framework used to increase or decrease water levels must take archaeological exposure risk into consideration. Once a decision to change water levels is made, ON must be immediately notified using agreed-upon protocols. The Guardian Watchmen must also be alerted immediately so they can find appropriate personnel to work the site at a moment's notice.

3.4. BC Hydro to share AIA's with Okanagan Nation Bands and involves Okanagan Nation in the survey work: ON should be asked to provide members to be involved in AIAs and other relevant surveys. Any resulting reporting materials, like AIAs, to be provided to ON, a minimum of 60 days prior to sending to BC's Archaeology Branch.

3.5. Develop an Okanagan Nation Use Area Protection Plan for both key Project Locations (Revelstoke Dam area and Summerland Capacitor Station area): BC Hydro to work with Okanagan Nation to develop an Okanagan Nation Use Area Protection Plan for each location, not less than 60 days prior to the start of construction. BC Hydro will show how these studies have informed re-routing, temporary workspace narrowing, site-specific mitigation, monitoring considerations, etc.

3.6. **Penticton Indian Band Monitoring Program for Summerland Capacitor Station.** Objectives must

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include archaeological monitoring during any land disturbance and long-term monitoring of animal movements, impacts to the Snpink'tn and Tsintskeneptm hunting and gathering communities, propagation of invasive plant species, propagation of increased human use and development in the region and other long-term impacts that have the potential to result from the proposed capacitor station.

3.6. **Other physical and cultural heritage mitigations, including but not necessarily limited to:**

a) Providing Okanagan Nation with the capacity to provide input into management recommendations relating to archaeological and cultural heritage resource issues related to the Project;

b) Supporting the Okanagan Nation to assist and mentor community members in obtaining and practising traditional and academic skills in fish, wildlife and land stewardship and care (e.g. academic scholarships, job shadowing opportunities, field work).

c) Involving Okanagan Nation in monitoring construction and operations, including implementation of environmental and cultural heritage resource management plans in the event that previously unidentified sites are discovered during clearing or construction or reservoir or power station operations;

d) Ensuring that sacred and spiritual sites, as well as historically significant areas, are no go zones and cannot be developed and every effort must be made to avoid, protect and manage these areas;

e) Okanagan Nation has exclusive proprietary and intellectual property rights to all cultural and traditional knowledge and information shared to advance the interests of Okanagan Nation in the planning, use, and management of lands and resources within the territory of the Okanagan Nation;

f) The proponent develop appropriate buffer zones around areas of cultural and spiritual practice, in consultation with Okanagan Nation, to mitigate the effects of noise and other effects from the Project; and

g) Okanagan Nation members must be included in environmental and archaeological and cultural heritage monitoring during and after construction activities for the life of the dam.

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CULTURE GROUP LEVEL RECOMMENDATIONS

A strong focus on BC Hydro supporting in a more meaningful way existing or fledgling Okanagan cultural continuity and retrenching plans, programs and initiatives. Overall Okanagan cultural protection programs may include but will not be limited to:

3.7. **BC Hydro to support development of an Okanagan culture and heritage restoration program:** BC Hydro will fund a heritage restoration program to protect, rehabilitate, and re-establish sacred sites and cultural features impacted or destroyed by Proponent activities throughout Okanagan territory. Funds will be made available for repatriating remains from already impacted grave sites, establishing clean and quiet spaces for cultural activities, implement a public education initiative regarding treatment of sacred and cultural places, encourage cultural activities with youth (e.g. support for Elders to teach youth to hunt and fish), organize Syilx dance, song, arts, and ceremony events to endure as long as the dam exists.

3.8. Develop one of many potential "cultural offsets" programs with BC Hydro support:

- Harvester program to assist with cost of gas, traps, gear to get out on the land;
- Funding assistance for cultural camps in Syilx territory;
- Others

4. *COMMUNITY WELL-BEING*

Here we identify preliminary Okanagan recommended measures re: community well-being. We look forward to further discussion with BC Hydro on the adoption of these measures; completion of the Part C assessment by Okanagan Nation will not be complete until we understand which of them have been committed to by BC Hydro, after which a revised assessment of residual effects can occur.

4.1. Support for social programs that offset social and economic impacts associated with cumulative effects on well-being. Measures may include:

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a) on the land treatment and traditional healing programs;
b) Culture camps and other on-territory activities, especially between generations, especially harvesting activities;
c) Creating and/or preserving spaces for peaceful enjoyment (including solitude and large areas of undisturbed natural environment) of territory;
d) Increased involvement of Okanagan members in non-invasive work in the Project RSA, especially in land, plant and wildlife restoration and rehabilitation programs;
e) Support the development of a Guardian program for indigenous monitors; among other initiatives that mix increased autonomy and connection to territory.

As autonomy and connectedness to land increase, adverse effects are replaced by healing and beneficial outcomes. Activities such as those listed above can have beneficial effects to counteract many decades or centuries of reduced autonomy and connection to territory.

We recommend that Okanagan identify recommendations to BC Hydro in relation to community well-being focus on identification of culture and well-being offset programs to increase community and cultural resilience, and retrench connections to the cultural landscape for Okanagan members.

5. *LIVELIHOODS and ECONOMY*

Here we identify preliminary Okanagan recommended measures re: economy and livelihoods. We look forward to further discussion with BC Hydro on the adoption of these measures; completion of the Part C assessment by Okanagan Nation will not be complete until we understand which of them have been committed to by BC Hydro, after which a revised assessment of residual effects can occur.

5.1. Develop and implement an Environmental Management Plan: In direct engagement with First Nations, develop an Environmental Management Plan that includes the following measures for wildlife (fish specific aspects of the Environmental Management Plan are discussed in the fish section above):

a) protect and enhance wildlife habitat, including (but not limited to) (i) re-vegetate using preferred species for wildlife and traditional use values, (ii) decommission all access placing physical blockades to restrict ATV access, (iii) manage vegetated areas to retain important

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food and cover species for wildlife adhering to highest standards, using only hand cutting to manage growth around facilities, etc.;

b) develop access management plan that would include increased access to specific areas for traditional harvesters and wider restrictions for hunting for non-residents;

c) include First Nations in decisions over harvesting allocations for wildlife; and,

Additional mitigation measures proposed related to wildlife and hunting, which is related to the vitality of traditional livelihoods, include:

Note: This section has yet to be revised and refined by ONA Natural Resources and Fisheries staff.

5.2. Development of a protocol to avoid impacting wildlife during their critical seasonal activities, develop appropriate site specific environmental protection plans including buffers and Best Management Practices for the protection of key habitat features, and develop habitat restoration and enhancement plans;

5.3. Preparing an adaptive management plan and scheduling construction activities to avoid sensitive breeding and migration periods for wildlife;

5.4. Collaboration with the Okanagan Nation to employ TEK and emerging techniques in disturbed site restoration to design and implement large scale, multi-year cottonwood and shrub live-staking in the 440m to 436m elevation band of the DDZ (reduced period of inundation) to re-establish self-sustaining riparian cottonwood/willow/red-osier forest and create self-generating wildlife habitat of value to multiple indigenous food and cultural species;

5.5. Collaboration with the Okanagan Nation to identify, design and implement meaningful wetland restoration/creation and habitat structural enhancement projects in Revelstoke Reach (e.g. at Big Eddy channel, 12-Mile, etc.) and add topographic heterogeneity (ponding/elevation differences) to wetland areas while mindful of potential to strand fish, and monitor results to confirm success and inform validity of the Rev6 EA findings;

5.6. Collaboration with the Okanagan Nation to carry on monitoring and assessment the Revelstoke Reach painted turtle population for another 10+ years, and to implement effective painted turtle habitat restoration and enhancement projects to ensure an adequate cohort of adult breeding females is sustained;

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5.7. Collaboration with the Okanagan Nation to design and implement a rehabilitation, restoration and biodiversity improvement plan to return the area disturbed by Rev 6 activities (and other previously disturbed area as appropriate) to productive forested (or novel old-field) wildlife habitat using natural ecosystem recovery processes;

5.8. Implementing a monitoring and adaptive management plan to address negative changes in wildlife movement patterns and habitat use;

5.9. Not disturbing active bird nests; scheduling removal of the draft tube plug and conduct of other construction activities outside of swallow (e.g. cliff or barn) nesting/rearing period. Implement netting or other non-disturbance processes to discourage nesting in the construction area prior to commencement of the nest building period; Avoiding the use of bright lights during bird and amphibian breeding/migratory periods. Monitor pre-, during- and post-construction use of the construction area by (and mortality of) aerial insectivores and bats;

5.10. Consulting with Okanagan Nation and knowledge holders to determine wildlife habitat values and wildlife activity, and in dealing with wildlife-related issues;

5.11. Collaboration with the Okanagan Nation to design and implement (build on data from CLBMON 55) a long-term (10+ years) monitoring program of invertebrate occurrence and species richness at several existing key wildlife wetland habitat areas and at future wetland-creation/restoration sites;

5.12. Collaboration with the Okanagan Nation to continue CLBMON33/12 monitoring of plant communities in the DDZ at landscape and site levels for at least another two decades to give time to assess ecological adjustment/change under ongoing reservoir operations (comparative Rev5 to Rev6 and beyond); and

5.13. Ensuring ongoing monitoring of migratory birds in order to consider any changes in seasonal variations, movement pattern changes, project activities or cumulative effects;

5.14. Ensure that research knowledge gained by Columbia Monitoring (clbmon) projects is applied to future research and work in the area;

5.15. **Develop an eco-cultural restoration programs** or similar food sovereignty program focused on promoting the health, distribution and access for harvesting purposes of wildlife, fish and plant materials found prior to contact, within Okanagan territory – see, for example Morrison (2006).

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5.16. Create and implement work force recruitment and retention plan for Okanagan Nation members: Measures may include:

a) communicating all calls for hires directly to OKIB/WFN/PIB/ONA and/or through all available media used by FN;

b) funding FN staff position dedicated to assisting prospective FN hires with tasks like CV writing, computer skills, training plans, interview skills, application processes, etc.;

c) relaxing employment requirements if they are statistically more likely to be prejudicial to FN member employment (e.g., lack of high school education vs. long experience) and give equal weighting to equivalent experience;

d) creating strategy to maximize recruitment and retention of FN workers;

e) developing constructive feedback mechanism for FN members who are not successful in their applications; and,

f) developing an employment committee or similar working group with BCH and ON, part of which's mandate may be to expedite identification of an appropriate system for benchmarking and monitoring of Indigenous hires, retention and job satisfaction, unpaid leave for cultural reasons.

5.17. Enhance procurement opportunities for Okanagan businesses: Measures may include:

a) unbundling of procurement contracts so that they are smaller and more manageable for First Nations-owned businesses to bid on;

b) feedback on failed bids; and,

c) BC Hydro to identify and enforce minimum OKIB, WFN, PIB and ONA procurement targets with primary and sub-contractors.

5.18. Skills training and employment readiness: Measures may include:

a) funding training for industry-related jobs (heavy equipment operators, welders, carpenters, ROW clearing / forestry, compressor station management, construction management, etc.);

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b) holding annual environmental monitoring/ technician training for FN (including soil sciences, water quality, forest ecology, fisheries, wildlife ecology, vegetation management, field skills, safety training, etc.);
c) offering training in the community rather than sending members away from home for training;
d) funding life skills training strategy for community or individuals (e.g. skills assessment, goal-setting, training and educational planning, computer skills, financial planning);
e) on-the-job skill development or adult education programs for career development among FN members; and,
f) sponsoring education, certification, or re-certification required by FN members who need upgrading (could include an extended probationary period in which to certify).

Closure

The Okanagan Nation is looking forward to defining appropriate mitigation and monitoring measures with BC Hydro. ON requires these measures to be included as agreeable EA Certificate conditions. ON has had time and resources to date to identify impacts of the proposed Project on rights and interests in a preliminary fashion only and, as such, ON is not prepared to formally identify the most appropriate mitigations. We expect at least two meetings with BC Hydro to discuss mitigations and reserve the right to introduce other identified mitigations following those meetings.

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Sincerely,

Fabian Alexis

Fabian Alexis

Okanagan Indian Band

Rev 6 Project Manager

C.C:

Chief Roxanne Lindley – Westbank First Nation

Chief Chad Eneas – Penticton Indian Band

Chief Clarence Louie – Osoyoos Indian Band

Grand Chief Stewart Phillip – Okanagan Nation Alliance - Chair

Pauline Terbasket – Okanagan Nation Alliance - Executive Director

Heather Noble – Environmental Assessment Office

Chris Waite – BC Hydro - Project Manager

Sandie Romanczak – BC Hydro - Aboriginal Relations

Rachelle Trent – BC Hydro - Aboriginal Relations

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Final Aboriginal Consultation Report 2

February 28, 2017

BC Hydro
Power smart

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LIST OF ABBREVIATIONS

BCEAA	British Columbia Environmental Assessment Act
BC EAO	BC Environmental Assessment Office
CC	Core Committee
cfs	Measurement of flow in cubic feet per second
dAIR	Draft Application Information Requirements document
dVC	Draft Valued Components document
EA	Environmental Assessment
EAC	Environmental Assessment Certificate
EAO	BC Environmental Assessment Office
e-PIC	EAO Electronic Project Information Centre
IRP	BC Hydro Integrated Resource Plan
TTG	Technical Task Group (sub-committee to CC)
MW	Megawatt

1. INTRODUCTION

1.1 About the Project

British Columbia Hydro and Power Authority ("BC Hydro" or "Proponent") is proposing to develop the Revelstoke Unit 6 Project which includes the following two project components:

Generation: Installation of an additional approximately 500 megawatt (MW) generating unit into an existing empty turbine bay at Revelstoke Generating Station, located on the Columbia River five kilometers upstream from the City of Revelstoke; and,

Transmission: Construction of a new capacitor station near Summerland on the BC Hydro 500 kilovolt transmission line (circuit 5L98) between Vaseux Lake Terminal Station and Nicola Substation to increase the capacity of the transmission system in the Interior of British Columbia.

1.1.1 Generation

The generation component involves installation of an additional approximately 500 megawatt (MW) generating unit and related equipment into an existing empty turbine bay at Revelstoke Generating Station, located on the Columbia River five kilometers upstream from the City of Revelstoke. Details of the construction activities are provided in the Project Description[1].

The on-site construction of the sixth unit would be expected to take approximately 40 months. Construction activities would be on disturbed ground within the existing footprint of the Revelstoke Dam and Generating Station and use the same laydown and parking areas that were used for Revelstoke Unit 5. An additional warehouse or expansion of the existing warehouse would also be required within the existing facility footprint.

The addition of the sixth generating unit would not be expected to lead to significant changes in the way the existing facility is operated. As outlined in the Project Description[1], the additional unit would provide the opportunity to use the existing water supply differently by releasing up to approximately 20% more water with all six units operating for short periods of time.

[1] Project Description, updated May 2016, is available at the BC EAO ePIC website: https://projects.eao.gov.bc.ca/p/revelstoke-generating-station-unit-6/docs/

Figure 1: Revelstoke Dam and Generating Station



Figure 1: Area Plan showing the location of the Revelstoke Dam and Generating Station.

1.1.2 Transmission

As part of the Revelstoke 6 Generation Project, BC Hydro plans to construct a new series capacitor station near Summerland on the BC Hydro 500 kilovolt transmission line (circuit 5L98) between Vaseux Lake Terminal Station and Nicola Substation. The new capacitor station would help to maintain voltage levels, thus providing greater system stability and improving the efficiency of the electrical system. It would serve all existing generation in the Southern Interior, including Revelstoke Dam Generating Station, with the sixth generating unit.

The BC Hydro owned property on which the new series capacitor station would be constructed is located on Bathville Road, west of Summerland. The on-site construction for the series capacitor station is expected to take approximately 18 months. Details of the construction activities are provided in the Project Description[1].

The new series capacitor station will not require any on-site operating staff. The station will be controlled and operated by BC Hydro's System Control Center, located in the Lower Mainland. BC Hydro's field services staff will visit the capacitor station on a regular basis to inspect it and carry out maintenance and repairs.

1.2 Regulatory Framework

The Project is subject to review under the *British Columbia Environmental Assessment Act* (BCEAA) because the Project exceeds the Reviewable Projects Regulation threshold of an increase of 50 megawatts or greater in the rated nameplate capacity for modifications to existing hydroelectric facilities. The generation component of the project is not subject to a review under the *Canadian Environmental Assessment Act* (CEAA) and is exempt from the requirement to obtain a Certificate of Public Convenience and Necessity from the BC Utilities Commission through the *Clean Energy Act*. The transmission component of the project is not anticipated to trigger a requirement for a Certificate of Public Convenience and Necessity.

The current water licence for the Revelstoke Dam has a diversion limit of 90,000 cubic feet per second (cfs). Although this limit was intended to account for six operating generating units, modern generating units can operate at a slightly higher diversion rate. The higher diversion rate results in an additional 58 MW of needed dependable capacity from Revelstoke Generating Station. To use this extra generation capacity, BC Hydro plans to apply to the provincial Comptroller of Water Rights for additional water licence of 3,000 cfs.

The current *Fisheries Act* Authorization applicable to Revelstoke Generating Station may need to be amended to include Revelstoke Unit 6.

Figure 2: Proposed Capacitor Station

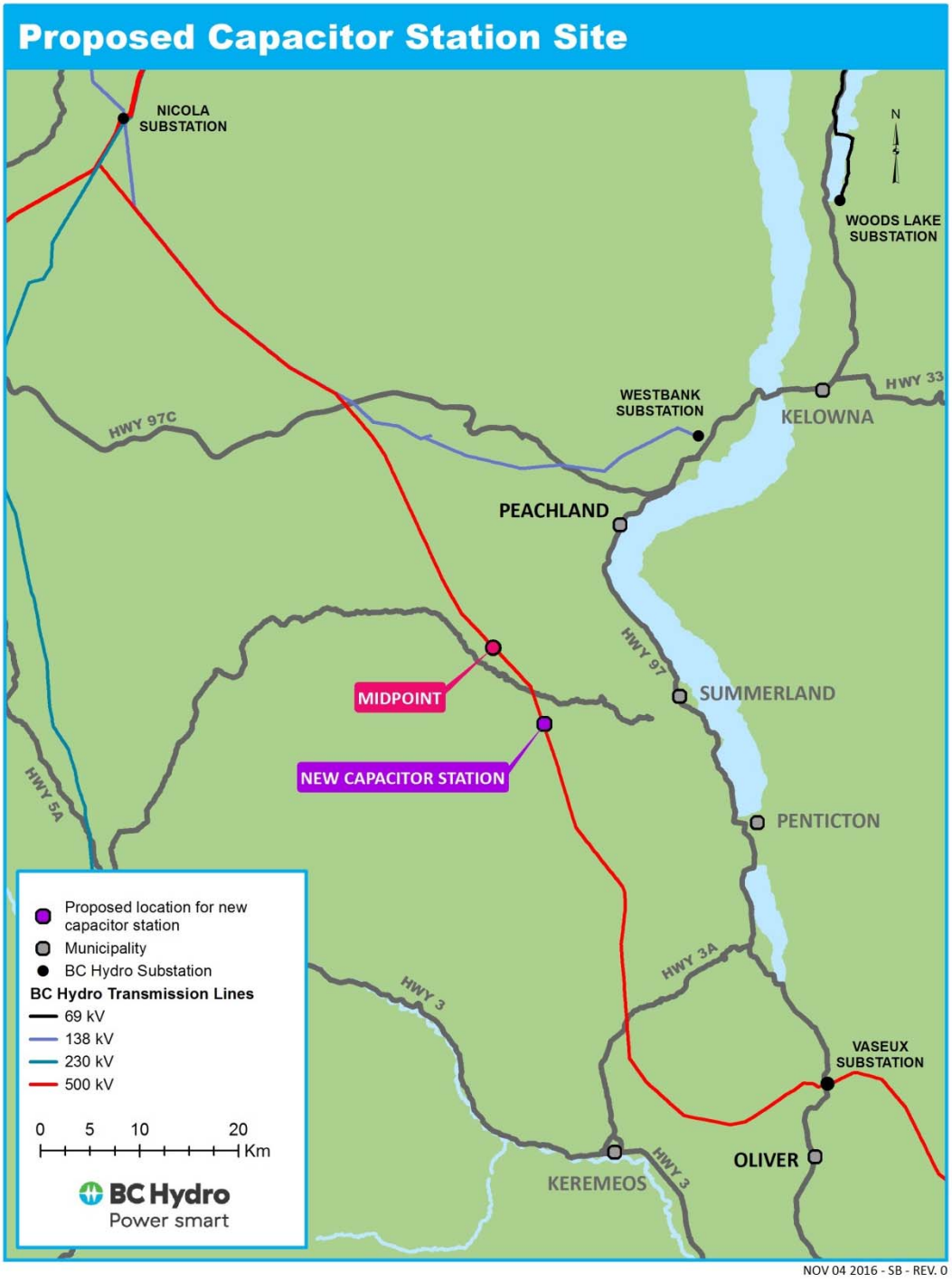


Figure 2: Proposed location of the capacitor station located adjacent to transmission line 5L98.

2. THE CONSULTATION REPORT

2.1 Purpose of the Document

BC Hydro is required to submit an Aboriginal Consultation Report to the BC Environmental Assessment Office (BC EAO) with the submission of the final draft Application Information Requirements (draft AIR). This reporting requirement is outlined in the BC EAO's Section 11 Order (the Order) under Section 14.1.1. This Aboriginal Consultation Report is a summary of the consultation activities undertaken with Aboriginal groups beginning in mid-late 2014 (introduction of draft Valued Components (VCs)) up to December 31st, 2016.

Further, BC Hydro must submit its Aboriginal Consultation Reports to the Aboriginal Groups listed on Schedule C for review and comment 30 days prior to submitting the reports to the Project Assessment Lead. BC Hydro must also advise the Project Assessment Lead how such groups were consulted and what feedback was provided. Feedback received must be captured in a tracking table in a format acceptable to the Project Assessment Lead.

As required under Section 14.3 of the Section 11 Order, the Aboriginal Consultation Report is intended to:

- Summarize the efforts undertaken by the Proponent to consult with Aboriginal Groups on Schedule C in accordance with the approved Aboriginal Consultation Plan;
- Record in a tracking table the feedback and information received during consultation;
- Identify the potential adverse impacts of the proposed Project on Aboriginal Interests; and
- Identify how the potential adverse impacts of the proposed Project on Aboriginal Interests will be avoided, mitigated, addressed or otherwise accommodated, as appropriate

A draft of this Aboriginal Consultation Report was shared with all potentially affected Aboriginal communities listed in Schedule C of the Order for review and comment, as directed in Section 14.2 of the Order. The draft Aboriginal Consultation Report# 1 was circulated to the affected Aboriginal communities on November 16, 2016. As of January 23, 2017, BC Hydro had not received any responses on the draft Report from Aboriginal communities and the final Aboriginal Consultation Report #1 was submitted to EAO on January 23, 2017. Comments from

EAO were incorporated in to a Final Aboriginal Consultation Report #1 dated February 2017[2]. The draft Aboriginal Consultation Report# 2 was circulated to the affected Aboriginal communities on January 27th, 2017. As of February 28, 2017, BC Hydro has not received any responses on the draft Report#2 from Aboriginal communities and the final Aboriginal Consultation Report #2 was submitted to EAO on February 28th, 2017.

2.2 Aboriginal Consultation Principles and Objectives

At BC Hydro, we exist to serve British Columbians with clean, reliable and affordable energy. We recognize that this system has impacts on the lives and interests of First Nations communities, and we are committed to working together and to building relationships that respect these interests. Our Statement of Aboriginal Principles guided our conduct throughout the consultation process.

Through our Statement of Aboriginal Principles - Our Commitment

1. We will always operate safely and protect the safety of individuals.
2. We will inform First Nations communities, to the best of our ability of our multi-year planning, identifying potential projects and works as early as possible for discussion.
3. We will strive to provide the most clear, accessible and transparent information possible.
4. We will seek advice on First Nations perspectives on how to best to reduce or avoid impacts on the environment, cultural heritage and social needs.
5. We will be accessible and open to understanding the unique interests of First Nations in relation to our operations.
6. We will respect that our perspectives may be based on different world views.
7. Where we are refurbishing existing facilities and assets, or building new infrastructure, we will seek opportunities for meaningful benefit to local First Nations communities.
8. We will seek solutions to improving the accessibility of clean reliable and affordable power to First Nations communities in remote areas of the province.
9. We will deliver leading employment and training programs to attract and support First Nations individuals to become an increasing part of the BC Hydro workforce.
10. We will deliver on our commitments and we will be open and transparent if something is standing in the way of our mutual success

Aboriginal consultation for the proposed Project was guided by the following principles that were

[2] The Final Aboriginal Consultation Report #1, dated February 2017, is available at the BC EAO ePIC website: https://projects.eao.gov.bc.ca/p/revelstoke-generating-station-unit-6/docs/

explained in the ACP. They include:

- Meaningful consultation characterized by a genuine attempt to address issues and concerns;
- Respect that Aboriginal groups in British Columbia occupy unique legal, historical and social circumstances; and,
- Recognition that Aboriginal interests flow from rights and title, and include economic and social aspirations.

2.3 Aboriginal Consultation Approach

The Aboriginal Consultation Plan[3] described the approach, methods, and activities that BC Hydro planned to use to share Project-related information and to seek input from Aboriginal groups on the proposed Project. In preparing this Report, BC Hydro carried out its engagement and consultation activities, as set out in the Consultation Plan, to identify the Aboriginal Interests of the Aboriginal groups that may be potentially affected by the Project. The scope and extent of consultation with each Aboriginal group was based on the scope of Aboriginal interests identified, and the degree to which those Interests may potentially be affected by the proposed Project.

This Report is based on the Consultation Plan developed in accordance with the Section 11 Order. It includes feedback from Aboriginal groups on the proposed consultation approach, including key project milestones and the accuracy with which their interests and issues have been characterized to date. The Report was guided by the following components:

- Identify Aboriginal groups who may potentially be impacted by the proposed Project;
- Determine what practices, traditions or customs have been, or are currently being engaged in by Aboriginal groups in the vicinity of, or in relation to the proposed Project;
- Determine how these practices, traditions or customs may potentially be impacted by the proposed Project;
- Develop an information-gathering plan to identify the information needed to assess potential impacts to Aboriginal Interests;
- Identify tools and implement consultation communication records;

[3] The Aboriginal Consultation Plan, dated March 15, 2016, is available at the BC EAO ePIC website: https://projects.eao.gov.bc.ca/p/revelstoke-generating-station-unit-6/docs/

- Ensure information is comprehensive and understandable and includes information on the scope of the Project and regulatory requirements, and potential effects on the environment; and,
- Provide capacity funding to facilitate participation of potentially- impacted Aboriginal groups in meaningful consultation regarding the Project.
- Provide feedback on how input has been considered in Project planning and the development of mitigation plans; and,
- Summarize the feedback received from Aboriginal groups during the consultation process in Consultation Summary Reports.

The approach and objectives to Aboriginal consultation are described in the Aboriginal Consultation Plan. The draft Aboriginal Consultation Plan[3] was shared in January 2016, with all potentially affected Aboriginal communities identified in the Plan. BC Hydro did not receive any comments from either Aboriginal groups or the BC EAO, and submitted the revised Aboriginal Consultation Plan to the BC EAO on March 15, 2016[3].

3. ABORIGINAL GROUPS

3.1 Generation Component Project Area

On May 22, 2015, the BC EAO issued the Section 11 Order identifying the Aboriginal groups to be consulted by BC Hydro for the proposed Project. The following are the Schedule C Aboriginal groups identified in the Section 11 Order, and that are located in the generation component project area.

Ktunaxa Nation

- Ktunaxa Nation Council
- ʔakisq̓nuk First Nation (Columbia Lake First Nation)
- yaqan nuykiy (Lower Kootenay Indian Band)
- ʔaq̓am (St. Mary's Indian Band)
- ʔakinkʷum‡asnuq‡iʔit (Tobacco Plains Indian Band)

Okanagan Nation

- Okanagan Nation Alliance
- Okanagan Indian Band
- Westbank First Nation

Secwepemc Nation

- Adams Lake Indian Band
- Neskonlith Indian Band
- Splatsin
- Simpcw First Nation
- Little Shuswap Lake Indian Band
- Shuswap Indian Band

The following are the Schedule B Aboriginal groups identified in the Section 11 Order, and that are located in the generation component project area.

Okanagan Nation

- Okanagan Nation Alliance:
  - Lower Similkameen Indian Band
  - Osoyoos Indian Band
  - Penticton Indian Band
  - Upper Nicola Band
  - Upper Similkameen Indian Band

Secwepemc Nation

- Bonaparte Indian Band
- Shuswap Nation Tribal Council
- Skeetchestn Indian Band
- Tk-emlups Indian Band
- Whispering Pines / Clinton Band

3.2 Capacitor Station Component Project Area

The following are the Schedule C Aboriginal groups identified in the Section 11 Order, and that are located in the capacitor station Project area.

Okanagan Nation

- Okanagan Nation Alliance
- Penticton Indian Band
- Westbank First Nation

The following are the Schedule B Aboriginal groups identified in the Section 11 Order, and that are located in the capacitor station Project area.

Okanagan Nation Alliance	Nicola Tribal Association	Nlaka'pamux Nation Tribal Council
• Upper Similkameen Indian Band	• Coldwater Indian Band • Cook's Ferry Indian Band • Nicomen Indian Band • Nooaitch Indian Band • Shackan Indian Band • Siska Indian Band • Upper Nicola Band	• Ashcroft Indian Band • Boothroyd Indian Band • Boston Bar First Nation • Lytton First Nation • Oregon Jack Creek Band • Skuppan Indian Band • Spuzzum First Nation

And,

- Lower Nicola Indian Band

3.3 Consultation Scope and Approach

Schedule C Aboriginal Groups

In the Aboriginal Consultation Plan (ACP), BC Hydro committed to provide the following to Schedule C Aboriginal groups:

- Project information and seek input to identification of issues, concerns or interests;
- Resources, including the provision of capacity funding and access to subject matter specialists to evaluate project information and formulate a response for BC Hydro's consideration; and,
- Consider and address all information and concerns brought forward by Aboriginal groups.

Schedule B Aboriginal Groups

In accordance with the Aboriginal Consultation Plan, BC Hydro also committed to remain receptive to meeting with any Aboriginal groups that expressed an interest in the Project, to provide information requested, and to respond to questions from the Aboriginal group. BC Hydro also undertook all additional consultation and mitigation activities directed by the EAO. BC Hydro considered all information provided by Section B Aboriginal groups, and where appropriate, took the time to evaluate, consider, and respond to the information provided.

Information in this Report is based on BC Hydro's commitment to provide meaningful opportunities for Aboriginal groups to participate in the consultation process and provide input into the proposed Project. The scope and extent of consultation with each Aboriginal group was based on the scope of Aboriginal Interests identified, and the degree to which those Interests may potentially be impacted by the proposed Project.

4. CONSULTATION PHASES

BC Hydro's consultation and engagement process is designed to support the ongoing and collaborative gathering and exchange of information, and continuous work toward identifying, mitigating, and accommodating potential impacts on Aboriginal Interests and Project related opportunities. The key Aboriginal consultation activities that make up this Plan have been grouped into the following stages:

Pre-Application Phase, covering the time period from the issuance of the Section 11 Order (May 22, 2015) to the filing of an Application for an Environmental Assessment Certificate (EAC);

Application Review Phase, covering the time period from the acceptance of the Application for an EAC by the EAO, to the receipt of the EAC; and,

Ongoing Engagement, covering the time period from the receipt of the EAC through to the construction of the Project.

The contents of this Report pertain to a period of the Pre-Application Phase from mid to late 2014, prior to the issuance of the Section 11 Order on May 22, 2015, to December 31st, 2016.

4.1 Summary of Consultation Efforts

Introduction

As stated in the Aboriginal Consultation Plan, BC Hydro initiated engagement with Aboriginal groups in mid-2012. Early engagement included informing Aboriginal groups of the 2012 Draft Integrated Resource Plan (IRP) and of the alternatives being considered to meet future electricity demand, including potentially Revelstoke Unit 6. Aboriginal groups were also advised that if the Revelstoke 6 Unit option was chosen, it likely would be necessary to develop a new capacitor station, along an existing transmission line.

In early February 2013, BC Hydro sent a letter and a draft Project Description to Aboriginal groups informing them of BC Hydro's intent to submit the Project Description to the BC EAO. The letter also requested their comments on the draft Project Description. Through 2013 and 2014, prior to the issuance of the Section 11 Order, BC Hydro continued to meet with Aboriginal groups

to discuss the proposed Project and to understand how they wished to be engaged on the Project.

Summary

To meet the consultation objectives described in the ACP, BC Hydro committed to:

- Consult on applicable data collection and methodology of analysis throughout the EA process, and facilitate participation where possible;
- Ensure appropriate capacity funding is provided to support consultation and engagement with BC Hydro through the EA process;
- Collaborate on the draft Application Information Requirements (dAIR) and the draft Value Components (dVC) documents and the subsequent EAO-led review; and,
- Consult on the activities and findings of the environmental assessment that will form the EA Application.

As directed by Section 14.2 of the Order, a draft of the Aboriginal Consultation Plan was shared with all of the potentially affected Aboriginal communities listed in Schedule C of the Order for review and comment. The ACP was accepted by the BC EAO on March 10, 2016.

From the outset of 2015, BC Hydro has held a number of Core Committee and sub-committee meetings called Technical Task Group (TTG) meetings. These meetings were designed to provide project information to First Nations and stakeholders in order to assess project impacts, and to solicit input to influence further assessment work. Input from these meetings was also designed to guide the development of mitigation measures. where required.

Over the period of consultation contained in this Report, BC Hydro provided all Aboriginal groups with information related to the Project. This information is summarized in the following sections, and includes the following:

- Valued Components (VC) related to the Project Environmental Assessment;
- Draft Application Information Requirements (dAIR);
- Draft copies of the Environmental Application, which contained the environmental baseline, the methodology, and the effects assessment related to the Project. This material also enabled Aboriginal groups to prepare Part C of the Environmental Application; and,
- Numerous studies including: Reservoir Archaeology Program (RAP) studies, and Water Use Planning (WUP) studies.

The above information was conveyed through workshops (TTG meetings) and or individual meetings with each of the Aboriginal groups listed in Schedule C. This information is further explained in Section 4.2.

Also, information provided at the CC/TTG meetings over the last year and a half has informed and guided the EA Assessment, and has led up to the development of the draft Revelstoke 6 Environmental Assessment Application. This document contains baseline information, methodology used, potential effects, and proposed mitigation measures. Detailed information pertaining to the CC/TTG process is described under Section 4.2.

Consultation and Capacity Funding Agreements (CCFA) have been put in place and/or offered to all Schedule C Aboriginal groups. BC Hydro is committed to ensuring all Aboriginal groups have sufficient capacity funding to be able to engage in the EA process.

A draft copy of EA Application containing baseline information was provided to all Schedule C Aboriginal groups on January 20, 2016. A subsequent draft copy of the EA Application was provided to all Schedule C Aboriginal groups on July 29, 2016. This second draft of the EA Application contained the assessment baseline, the methodology, the Project effects, and preliminary mitigation and monitoring measures. This information allowed the Schedule C First Nations to begin focused efforts towards the preparation of Part C of the Application. This information also allowed the Schedule C First Nations to form a basis for reviewing the effects from the Project, and to identify areas where Aboriginal interests are affected by the Project.

The Aboriginal Consultation Plan[3] allowed BC Hydro to explore appropriate measures to avoid, mitigate, or otherwise address potential Project impacts on identified and established Aboriginal interests. Since the tabling of the June 29, 2016, draft EA Application, BC Hydro and Aboriginal groups have engaged in discussions on the effects of the proposed Project and on mitigation measures where required.

The Aboriginal groups listed under Schedule C of the Section 11 Order (Sections 3.1 and 3.2 above), expressed a desire to directly write Part C of the EA Application. To support this initiative, BC Hydro, in September 2015, held a Part C Collaborative Writing Workshop. The workshop provided an opportunity for Aboriginal groups and BC Hydro to discuss to the content and scope of Part C, and to define a collective framework for the collaborative writing of Part C.

BC Hydro recognized that the Aboriginal groups writing Part C required added resources to complete this undertaking. As such, BC Hydro provided additional capacity funding related to this undertaking.

Appendix A – Comments Tracking Table contains all comments received by BC Hydro from Aboriginal groups on all documents described above. Also, this Table contains the responses by BC Hydro to each Aboriginal Groups comments. The format for this Table was described in the Aboriginal Consultation Plan was reviewed by all Schedule C Aboriginal groups and accepted by the BC EAO.

Further, a high level summary of the issues found in the Comment Tracking Table is contained in Section 5.2 of this Report.

The high level activities underlying BC Hydro's consultation efforts are summarized in the table below:

Table 1: Summary of Information Provided

Aboriginal Community	Project Description and Update (1)	Draft EA Application (2)	Aboriginal Consultation Plan	VCs / dAIR	Aboriginal Consultation Report#1&2
Generating Station					
Ktunaxa Nation Council	Y	Y	Y	Y	Y
Okanagan Nation Alliance	Y	Y	Y	Y	Y
Okanagan Indian Band	Y	Y	Y	Y	Y
Westbank First Nation	Y	Y	Y	Y	Y
Adams Lake Indian Band	Y	Y	Y	Y	Y
Little Shuswap Lake Indian Band	Y	Y	Y	Y	
Neskonlith Indian Band	Y	Y	Y	Y	Y
Shuswap Indian Band	Y	Y	Y	Y	Y
Simpcw First Nation	Y	Y	Y	Y	Y
Splatsin	Y	Y	Y	Y	Y
Capacitor Station					
Penticton Indian Band	Y	Y	Y	Y	Y
Okanagan Nation Alliance	Y	Y	Y	Y	Y
Westbank First Nation	Y	Y	Y	Y	Y

Notes:

1. *Updated Project Description was provided to First Nations in May 2016.*
2. *On July 29, 2016 a draft copy of the Revelstoke 6 Environmental Assessment Application was provided to all Aboriginal groups included in Schedule C of the BC EAO Section 11 Order. The draft Application contains baseline information, methodology utilized, potential effects and preliminary mitigation measures. The purpose of the draft Application is to assist Aboriginal groups in the preparation of Part C of the Environmental Application.*
3. *Draft Aboriginal Consultation Report #1 was provided to Aboriginal groups on November 16th 2016*
4. *Draft aboriginal Report #2 was provided to Aboriginal groups January 27th, 2017*

4.2 Sharing of Project Information

SharePoint Sites for each Aboriginal Group

BC Hydro set up a SharePoint site for each of the Secwepemc, Ktunaxa and Okanagan Nations as central repositories for information related to the Project including meeting minutes, reports, studies and presentations. Also included are copies of the VCs, dAIR, draft EA Application, Comment Tracking Table and all materials from the Core Committee meetings. Supporting studies and other relevant documents have also been uploaded to each site. Each SharePoint site can only be accessed by the respective First Nation for whom the site has been established.

Aboriginal Group Rev 6 Working Groups

Each of the Schedule C First Nations established joint working groups to review the Project and to develop Part C of the Application. Okanagan Nation requested a "parallel process" to address concerns over the sharing of confidential information at more public forums such as the Core Committee and Technical Task Group meetings, and to facilitate information sharing with members of their Project Review Committee (PRC)

CC/TTG meetings

BC Hydro established a Core Committee in November 2013 to facilitate engagement and ensure a diverse range of perspectives are considered. Core Committee members included representatives from First Nations, Tribal Councils, local governments, government agencies, and community members. The purpose of the Committee is to review project information, recommend studies, identify potential project impacts, and recommend mitigation measures to maximize project benefits and minimize project impacts. The Committee members have acknowledged the benefit of this diverse interest base and recognize that different perspectives lead to a wider perspective of the Project. Refer to the Public Consultation Report for details on membership.

Table 2 below shows the dates and subject matter discussed at the Core Committee (CC) and related Technical Task Group (TTG) meetings held over the past 12-14 months. Each of the meetings shown on the Table was of approximately one day in duration. First Nation representatives included members from the Aboriginal groups listed under Schedule C.

Table 2: Summary of Core Committee/Technical Task Group Meetings

Core Committee (CC) Meetings	Meeting Overview
#1 November 20-21, 2013	Overview of Revelstoke 6 project including regulatory and engagement process
	Overview of Revelstoke Dam operations
	Scoping of potential issues/concerns with the project
#2 March 5-6, 2015	Re-confirmed the REV6 Core Committee engagement process, discuss terms of reference
	Provided overview to Provincial Integrated Energy Plan and influence on Revelstoke operations
	Introduced and received initial feedback on the draft VCs and draft AIR documents for REV6
#3 May 13-14, 2015	BC Hydro provided assessment of potential impacts of climate change on water resources
	Provided information related to BC Government's ongoing Columbia River Treaty (CRT) process
	Summarized committee feedback and BCH responses on the draft VCs and draft AIR documents for REV6
#4 December 01, 2016	Provided the opportunity for BC Hydro to present a summary of the draft environmental assessment results for REV6 and for Committee members to ask questions, discuss results, and present information to consider in the finalization of the environmental assessment and water license applications. Committee member views and perspectives were documented for the Core Committee Report.

Community Sub Committee Meetings	Meeting Overview
#1 January 23, 2014	Provided an opportunity to Review REV5 commitments and WUP / WLR Studies and to identify and initiate discussion on a number of REV6 Issues including: locations, surface and groundwater research, Downie Marsh hydrological model, stream-bank erosion monitoring, drawdowns and fish entrainment.
#2 October 18th, 2016	Provided an opportunity to review, discuss, and provide feedback to BC Hydro on the draft results of the effects assessment for the economic, socio-community, and land & resource use Valued Components (VCs) and to brainstorm potential mitigation or monitoring measures, as necessary for further discussion.

Technical Task Group (TTG) Meetings	Meeting Overview
Hydrology/Geophysical H1 – June 25, 2015 H2 – November 18, 2015	Reviewed assessment approaches, data, analysis methods and results pertaining to flows, water levels and primary geophysical effects of dam and reservoir operations and the incremental changes that could result from the installation of the 6th generating unit.
H3- September 14, 2016	Reviewed, discuss, and provided feedback to BC Hydro on the Mid-Columbia River overview hydraulic/geophysical and erosion assessment results.
Fish / Aquatics F1 – September 30, 2015 F2 – November 18, 2015 F3 – April 15, 2016	Reviewed, discussed, and provided feedback to BC Hydro on the description of the baseline conditions, assessment methodology, potential effects and information sources for the fish and fish habitat VCs.
F4- October 4, 2016	Reviewed, discussed, and provided feedback to BC Hydro on the assessment of effects on fish and fish habitat.
Terrestrial / Wetlands T1 – October 1, 2015 T2 – April 13, 2016	Reviewed, discussed, and provided feedback to BC Hydro on the description of the baseline conditions, assessment methodology, potential effects and information sources for terrestrial vegetation and wildlife VCs.
T3- September 16, 2016	Reviewed, discussed, and provided feedback to BC Hydro on the draft results of the assessment for Mid-Columbia River Valued Components.
Archaeology A1 – November 19, 2015	Reviewed, discussed, and provided feedback to BC Hydro on the description of baseline conditions, assessment methodology and information sources for the archaeology VCs.
A2- September 15 2016	Reviewed, discussed, and provide feedback to BC Hydro on the heritage and archaeology effects assessment.
A3-November 8 2016	Reviewed, discussed, and provided feedback to BC Hydro on Draft 3 of the Heritage section of the Environmental Assessment, including residual and cumulative effects and provide update on 2016 archaeology fieldwork.
Q and A October 5, 2016	Provided the opportunity for TTG members to pose detailed questions regarding the assessment findings and recommend any measures for BC Hydro to consider in finalizing the development of the REV6 Environmental Assessment and Water License Applications

The Core Committee/Technical Task Group meeting format has been a useful way to provide information and seek comments on the Project. BC Hydro has also had separate meetings with all Schedule C Aboriginal groups to ensure specific interests were addressed.

All comments received from the CC/TTG meetings are contained in the Comment Tracking Table under Appendix A.

Salmon Restoration

At the May 2015 Core Committee meeting BC Hydro committed to undertaking a conceptual level salmon restoration study. This study was intended to identify any design or operation considerations of REV6 that could influence the potential success of any future salmon restoration initiatives at Revelstoke. BC Hydro invited First Nation representatives to discuss the development of the request for proposal and comment on the scope of the study.
Further, BC Hydro provided First Nations' representatives an opportunity to review the work plan of the selected consultant as well as to review a draft copy of the report "Assessment of Revelstoke Unit 6 Addition Implications on Future Anadromous Fish Passage at Revelstoke Dam" prior to it being finalized in early 2016.

The report and minutes from conference calls related to the development of the report have been uploaded to the SharePoint sites of each Aboriginal group. The final report was provided to Schedule C First Nations March 18, 2016.

4.3 Valued Components (VCs) and Draft Application Information Requirements (dAIR)

In July 2014, BC Hydro hosted a Valued Component (VC) workshop for all Aboriginal groups. Information was provided outlining the Environmental Assessment process and in particular the criteria used for the identification of potential VCs. In September 2014, follow up information was provided to all Aboriginal groups that included a summary of the candidate valued components, sub-components and baseline references.

In January 2015, drafts of the Application Information Requirements (dAIR) and Valued Components (dVC) documents were provided to First Nations for review and input prior to their submission to the EAO. Later in March, BC Hydro held a Core Committee meeting that included a review of draft VCs and AIR. Written comments were received from many of the Aboriginal groups and are contained in the Comment Tracking Table under Appendix A
In May, BC Hydro held another Core Committee meeting, which in part, reviewed comments received from Aboriginal groups stemming from the March Core Committee meeting.

Since mid-2015, BC Hydro has held a number of Technical Task Group (TTG) meetings (see Section 4 Table 2) to present and review assessment results of various subjects related to the EA process, during which VCs were discussed and reconfirmed on an ongoing basis. During the second half of 2015, BC Hydro held a number of Technical Task Group (TTG) meetings (see Section 4. Table 2) to present and review assessment results of various subjects related to the EA process, during which VCs were discussed and reconfirmed on an ongoing basis.

In March 2016, BC Hydro provided a copy of the dAIR to all Aboriginal groups in advance of the BCEAO working group meeting held on April 5, 2016. Comments provided to the BCEAO related to the dAIR are found in the Comments Tracking Table under Appendix A as well as BC Hydro's responses to these comments.

4.4 Field Studies/Data Collection/Part C

Capacitor Station

The following field surveys undertaken at the proposed capacitor station site were each accompanied by representatives of the Penticton Indian Band:

- Eagle Cap Consulting conducted rare plant survey at the capacitor property on 7 August 2014, which was accompanied by a member of the Penticton Indian Band.
- SNC-Lavalin conducted terrestrial surveys within the study area from May 20 to 23, 2014, and from June 4 to 5, 2014. A representative, each from Columbia Environmental and the Band Penticton Indian Band attended the field visits.
- SNC-Lavalin conducted the winter wildlife survey within the study area on February 12, 2014. A representative, each from Columbia Environmental and the Band Penticton Indian Band attended the field visits.

In September 2014 BC Hydro contracted the Penticton Indian Band to conduct an archaeological impact assessment (AIA). The contract allowed Penticton Indian Band to manage all aspects of the work and to assign personnel to the project at their discretion.

Archaeology Potential Model (Mid-Columbia Reach)

Hydrological information has indicated that there may be some increased erosion and risk to existing archaeological sites contrary to what was initially thought. As part of the environmental assessment and in collaboration with all Aboriginal groups a decision was made to investigate a performance measure to address impacts to unknown archaeological sites related to the assessment.

It was determined that a new archaeological model is required to complete the effects assessment as the current model does not include the drawdown zone portion of the Mid-Columbia River (MCR) and does not meet current regulatory standards for archaeological overview assessment (AOA) modelling. BC Hydro sought advice from representatives from all Aboriginal groups through a series of conference calls beginning in April 2016. Through a collaborative process the parties were able to select a consultant to carry out the modelling and to provide guidance on the attributes of the model to be developed. In the fall of 2016 representatives from interested Aboriginal groups participated in field work testing the model's predictive capabilities, and to identify new sites. Details of the predictive model and minutes from

conference calls related to the development of the model have been uploaded to the SharePoint sites of each Aboriginal group.

Part C of the Application

The Aboriginal groups listed under Schedule C of the Section 11 Order (Sections 3.1 and 3.2 above), expressed a desire to directly write Part C of the EA Application. To support this initiative, BC Hydro, in September 2015, held a Part C Collaborative Writing Workshop. The workshop provided an opportunity for Aboriginal groups and BC Hydro to discuss to the content and scope of Part C of the Application, and to define a collective framework for the collaborative writing of Part C.

In January and July 2016, BC Hydro provided Aboriginal groups with copies of the draft Environmental Assessment to assist Aboriginal groups with the preparation of Part C. In December, 2016 Aboriginal groups provided initial drafts of Part C to assist BC Hydro in developing the Application.

BC Hydro recognized that the Aboriginal groups writing Part C required added resources to complete this undertaking and as a result BC Hydro has provided and continues to provide added capacity funding respecting additional data collection, studies, and the writing and internal reviews of Part C of the Application.

4.5 Capacity Funding

BC Hydro has provided or offered capacity funding to the Aboriginal groups in Schedule C of the Section 11 Order (shown in the Table 3 below). The capacity funding is intended to enable Aboriginal groups to obtain the resources required to meaningfully engage in meetings and other activities related to the proposed Project. Further, BC Hydro has provided or is in the process of providing additional funding for the purpose of enabling all Aboriginal groups to take on the added task of writing Part C of the EA Application.

Table 3: Capacity Funding

Aboriginal Community	Capacity Funding
Generating Station	
Ktunaxa Nation Council	Y
Okanagan Nation Alliance	Y (1)
Okanagan Indian Band	Y
Westbank First Nation	Y (1)
Adams Lake Indian Band	Y
Little Shuswap Lake Indian Band	Y
Neskonlith Indian Band	Y
Shuswap Indian Band	Y
Simpcw First Nation	Y
Splatsin	Y
Capacitor Station	
Penticton Indian Band	Y
Okanagan Nation Alliance	N/A (2)
Westbank First Nation	N/A (2)

Notes:

1. *Interim capacity funding has been provided when consensus has not been reached on details related to a final agreement. It is anticipated that formal funding agreement will be finalized shortly.*
2. *Noted as N/A because the CFA did not separate the capacitor funding from the generation funding.*

5. ADDRESSING AND TRACKING ISSUES, CONCERNS, AND INTERESTS

5.1 Reporting and Tracking Issues and Concerns

The Aboriginal Consultation Plan stated that, through the consultation process, consultation results would be documented to ensure that key issues and concerns are recorded and identified for follow-up, if necessary. Comments provided by Aboriginal groups directed towards Aboriginal Interests and subsequent responses provided by BC Hydro are documented in the Aboriginal Consultation Report and are specifically found in the Comment Tracking Table under Appendix A.

BC Hydro has documented Project-related consultation activities to ensure that:

- The consultation process is accurately reflected in materials submitted to regulators and as part of the EA process;
- Interests and issues raised by Aboriginal groups through consultation (Appendix A) are captured for the purposes of responding, resolving and/or otherwise addressing any potential impacts to Aboriginal interests raised through the consultation process as appropriate; and
- BC Hydro's follow up actions including responses to issues raised are incorporated in the Comment Tracking Table (Appendix A).

This report, including the Comment Tracking Table in Appendix A, is designed to meet the consultation record requirements of the BC EAO.

5.2 Summary of Issues, Concerns and Interests (from Tracking Table)

BC Hydro has summarized concerns from Aboriginal groups and BC Hydro's response to those comments shown in the Comment Tracking Table contained in Appendix A in the following Tables:

- **Table 4: Collective Concerns from Schedule C First Nations**
- **Table 5: Ktunaxa Nation Concerns**
- **Table 6: Okanagan Nation Nations Concerns**
- **Table 7: Secwepemc Nation Concerns**

Table 4 provides a summary of shared concerns of First Nations. A complete list of issues raised by Aboriginal Groups can be found in Appendix 1: Consultation Tracking Table and on First Nation Rev 6 SharePoint sites.

In summary, collective concerns from Aboriginal groups include: EA process issues; concerns with the content of the revised dAIR (Dec 16th, 2016) including identification of appropriate VC and cumulative effects assessment; possible data gaps that Aboriginal groups believe may be impeding a complete understanding of project-related impacts on cultural and natural resources; establishing appropriate baselines and Project scope; inclusion of traditional knowledge in collection and interpretation of data; addressing potential effects of erosion on archaeological and cultural heritage sites; potential operational effects on sensitive wetlands and ecosystems; understanding the effects of Rev 5 and prediction of potential Rev 6 effects; findings of non-measurable effects; consideration of climate change; potential Project design and operational effects that may increase barriers to future salmon restoration; maximizing socio-economic benefits and opportunities; and compensation for hydroelectric development in the Columbia, including Revelstoke Dam.

Table 4: Collective First Nations Concerns

REVELSTOKE 6 COLLECTIVE FIRST NATION CONCERNS Table 4		
Topic	**First Nation Concerns**	**Response**
Fish Habitat, Passage, and Entrainment	• Perceived that assessment of changes in water levels focuses on the Revelstoke Dam Forebay and that results do not reflect site specific conditions experienced in (near) spawning tributaries. • Viewed that further water level changes could have significant effects on fish if tributary access is already impeded.	• Water level fluctuations in Revelstoke Reservoir are considered in the assessment. The study area encompasses the whole of Revelstoke Reservoir, not just the forebay. Earlier studies of tagged fish in tributaries showed that they were not were not affected by water levels or forms of impedance.
	• Concerns have been raised about the importance of pre-contact information being included in the baseline conditions.	• A discussion of pre-dam conditions and the effects of river regulation are provided in both the Hydrology and Fluvial Geomorphology, and the Fish and Fish Habitat sections of Part B. Pre-contact conditions can be discussed in Part C of the Application
Birds	• The effects of Rev 5 operations on bird abundance and diversity appear to be uncertain and insufficient to determine the potential effects of Rev 6 operations.	• The bird surveys completed for the Water Use Plan (WUP) included considerable effort within the LSA and data collected are sufficient to inform the EA. WUP studies implemented since 2008 have explored a number of topics related to birds.
	• There seem to be a number of listed owl, waterbird, shorebird, grassland, forest, raptor and aerial insectivore species for which no systematic breeding surveys have been done in the generation LSA (500 m buffer included).	• Operational effects are expected only within the draw done zone (DDZ). Extensive bird monitoring programs are ongoing in the DDZ and the species mentioned have been documented during some years. These studies are available on the BC Hydro Southern Interior WUP website https://www.bchydro.com/about/sustainability/conservation/water_use_planning/southern_interior/columbia_river/arrow-operations.html

REVELSTOKE 6 COLLECTIVE FIRST NATION CONCERNS Table 4		
Topic	**First Nation Concerns**	**Response**
Cumulative Effects, Residual Effects, and Significance	• A comprehensive cumulative effects assessment, including past, present, and reasonably foreseeable future development and impacts within a scientifically justifiable temporal and spatial scope, should be completed. • Significance thresholds should be developed for each VC, with consideration of past changes, current conditions, and the risk of further change. Risk assessments will be an important prerequisite for the determination of significance thresholds. • Aboriginal perspectives on significance thresholds and acceptable risks should be considered and incorporated.	• Cumulative effects assessment considers the effects of past, present, and reasonably foreseeable future development where there is an interaction with the residual effects of the proposed project. • Significance criteria have been presented in the AIR and will be described in greater detail in the Application. • Aboriginal perspectives on significance criteria will be considered if provided and documented in the Application
	• Expressed interest in identifying what thresholds were used for determining significance of effects, and how this was determined including input from First Nations.	• Significance criteria have been presented in the AIR and will be described in greater detail in the Application. Inputs related to significance criteria from First Nations and regulators will be considered and made public as part of the EA process.
Valued Components (VC)	• Ecosystem Health and Function should be a VC, rather than just a sub-component of aquatic and terrestrial VCs. • Biodiversity should also be a VC.	• Ecosystem health and function is a sub-component of Ecological Communities. • The sub-component considers effects to the other VCs - including plants, herptiles, birds, and mammals. • Ecosystem Health and Function for Biodiversity is a specific sub-component of the Ecological Communities VC where linkages will be considered between habitats available within the study areas and the occurrence of both flora and fauna.

REVELSTOKE 6 COLLECTIVE FIRST NATION CONCERNS Table 4		
Topic	**First Nation Concerns**	**Response**
	• It is critical for understanding the actual impacts to each VC of the Revelstoke 6 Project to include a pre-dam context discussion which refers to the natural range of variability and ecological thresholds for each VC (and how much the current condition of the VC has strayed from that). Confining this discussion to Revelstoke 5 forward is not adequate.	• Pre dam conditions are discussed for the VCs in the draft Application as they contribute to the overall understanding of the VC's context. However, there are no quantitative data available on pre-dam populations, and very little quantitative data available pre-dam in general.
Impacts to Cultural Rights and Interests	• Cultural Heritage and Archeology should be separate VCs. Improve current Reservoir Archeology Programs (RAP) to provide more comprehensive and representative information on archeological sites. • Specific measures for erosion be developed and linked to the ongoing impacts on archeological sites. • Studies should include indigenous knowledge and assessment of the effects from an aboriginal perspective. • Consideration should be given to turning over the management of the RAP to the Columbia Basin First Nations.	• Historical and Archaeological Heritage is a proposed VC. Cultural Heritage will be addressed by Aboriginal groups in Part C of the Application. • The Reservoir Archaeology Program (RAP) is currently in Phase 1 where work is being conducted to inventory protected heritage sites. Once this is complete a management plan will be developed with input from the Columbia Technical Working Group (TWG) that includes First Nations and BC Hydro. • ~~Suggestions related to First Nation management of the RAP will be shared with the Columbia TWG.~~
Sufficiency of Baseline Information or Indicators	• Identification of baseline conditions should include characterization of conditions at (at least) 3 points in time, including pre-dam, pre-Rev 5, and pre-Rev 6. Temporal trends should be developed (estimated) for each VC to better understand the extent of past change and context of Rev 6 impacts. This analysis is necessary to adequately determine the significance and risk of further impacts. • Conduct rigorous project-specific field programs to accurately describe the existing environment with respect to plants and ecological communities. • Ecosystems and species of special concern and supporting habitats within and adjacent to the proposed area of influence	• Existing conditions describe as applicable historical conditions and past change for many of the VCs, but in some cases is limited by the data available to describe historic conditions. • The surveys completed for the WUP and other programs included considerable effort within the LSA and data collected are sufficient to inform the EA. Results of multi-year monitoring programs currently ongoing in the DDZ are appropriate to assess wildlife and vegetation responses to reservoir operation. • Data from the WUP monitoring

REVELSTOKE 6 COLLECTIVE FIRST NATION CONCERNS Table 4		
Topic	**First Nation Concerns**	**Response**
	(see general comments) should be documented. • Species and communities of special concern includes those species of interest to First Nations as well as provincially and federally-listed species of concern.	programs are suitable and relevant to the REV6 assessment as they provide detail on the proposed Indicators of many Sub-components - including provincially and federally-listed species of concern (and supporting habitats)
	• It is the distribution of that habitat is important indicators for federal or provincial listed plants/ herptiles mammals should include "abundance and distribution of known occurrences of listed species" and "abundance, distribution and quality of suitable habitat for listed species"	• The approach of the assessment is to identify the habitats present within the LSA that would be potentially affected with the addition of a sixth generating unit. Should these important habitats be measurably affected then species themselves that are known to occur in these habitats could also be affected. • The dAIR currently has 'presence, quality, and quantity of potentially suitable habitat' as an indicator.
Terrestrial LSA	• Rigorous project-specific field programs should be undertaken to accurately describe the existing environment.	• Rigorous field programs for many VCs are being conducted for the WUP studies. These studies describe the existing environment. Additional studies were added to understand the habitats and potential species occurrence where data was limited. These studies are available on the BC Hydro Southern Interior WUP website: https://www.bchydro.com/about/sustainability/conservation/water_use_planning/southern_interior.html • Detailed information is provided in Part B of the Application.
	• Concerned why the entire Revelstoke Reservoir is not included in the generation LSA, given that there is a projected increase in daily water level fluctuations of up to 20 cm. Wouldn't these increases in	• Discussions have generally focused on potential effects downstream of Revelstoke Dam. In the REV 5 EA potential effects within the Revelstoke Reservoir

REVELSTOKE 6 COLLECTIVE FIRST NATION CONCERNS Table 4		
Topic	**First Nation Concerns**	**Response**
	variations of water levels potentially impact more VCs.	were considered but were found to be negligible or none. A 20 cm changes within the current operational bounds are not expected to affect any VCs.
Heritage Resources	• Cultural Heritage should be a stand-alone VC. Sub-components to this VC would include culturally important resources (e.g. water, fish, wildlife, plants…etc.), land use (e.g. hunting, fishing, gathering, transportation, recreation, cultural sites, village sites…etc.), and archeology. Cultural Heritage should include landforms and landscapes not covered under the BC Cultural Heritage Act.	• The Heritage and Archaeology candidate VC has been split into 'First Nations Cultural Heritage' and 'Historical and Archaeological Heritage'. • 'First Nations Cultural Heritage' section will be assessed by Nations in Part C of the application; subcomponents will include landforms, intangible heritage sites, traditional use and knowledge.
	• Temporal Boundaries respecting Archaeological resources should be re-examined. Since Archaeological resources are non-renewable the temporal boundary should be in perpetuity - not just for the construction period.	• The temporal boundary assessment of effects on archaeological resources will be updated to reflect that impacts to heritage sites are irreversible and therefore would be in perpetuity.
EA Process	• The Environmental Assessment should include comprehensive review of potential impacts to all areas as a result of Rev6 operation. For example, upstream reservoir(s) and dam operational effects. Both direct and indirect effects to VC's should be considered.	• The environmental assessment is focussed on the interactions between the Project and the VCs, including direct and indirect effects. There will be no change to normal Revelstoke Reservoir operating range, and daily water level fluctuations would be similar between REV5 and REV 6.
Salmon Restoration	• An approach to work with First Nations to restore fish passage at BC Hydro dams should be identified.	• The Canadian Columbia River Intertribal Fisheries Commission (CCRIFC) has proposed the formation of a multiagency committee to examine the feasibility of salmon restoration in the Columbia. BC Hydro has agreed to participate in such a committee.

REVELSTOKE 6 COLLECTIVE FIRST NATION CONCERNS Table 4		
Topic	**First Nation Concerns**	**Response**
	• When considering Project impacts Project scenarios should be considered where salmon are able to successfully pass to the base of Revelstoke dam.	• Revelstoke Unit 6 project activities and operations will not preclude the ongoing potential for future fish passage or fish resource use of concern to First Nations.
Inclusion of TEK	• Unclear or missing guidelines/directives for the meaningful inclusion of traditional ecological knowledge (TEK) in survey, sampling and baseline information collection techniques	• BC Hydro understands their importance of TEK and contributions from knowledge holders, and is willing to include any TE information received. • TEK and contributions from knowledge holders will be provided in Part C of the Application.
Non-measurable Effects	• Concerns that findings of non-measurable effects are underestimated when applied across eco-systems in the MCR	• Non-measurable effects are those effects that cannot be quantified. These effects are insignificant as they are small, non-existent and/or within the existing variability of the physical, and ecological parameters.
Climate Change	• Concerns that climate change has not been properly addressed in the methodologies and data trends.	• BC Hydro shared a number of reports on Climate Change including the Technical Data report: Climate Change Summary July, 2016, and also addressed specific issues in the technical task group meetings.
Application: Part C	• State that Part C is difficult to do without the cumulative effects assessment and their lack of confidence in the assessment findings. • Suggest that they will need more time and resources to write Part C of the Application.	• BC Hydro will continue to work through these issues with nations prior to filing but recognize that we will probably continue to have divergent opinions • The deadline for the submission of Part C draft (i.e., without governance approval) was extended from October 15 th, 2016 to January 25th, 2017.
Socio Economic	• Want measures taken to ensure that Aboriginal workers and businesses have opportunities to benefit from the Project through improved access to employment, training and procurement	• BC Hydro's Aboriginal Procurement Strategy encompasses its approach to Aboriginal / Indigenous purchase strategy, hiring targets, and retention.

REVELSTOKE 6 COLLECTIVE FIRST NATION CONCERNS Table 4		
Topic	**First Nation Concerns**	**Response**
Past Hydroelectric Development	• Concerns that Aboriginal groups have not been adequately compensated for the impacts of past hydroelectric development in the Columbia Region	• This issue is outside the scope of the Rev 6 Project and BC Hydro's mandate
Revenues	• Request to provide estimations of anticipated revenue from the project, the additional 3000cfs water license, and as well as the Revelstoke Dam as a whole	• At his time BC Hydro does not report revenue on a per facility basis.

Table 5 provides a sample of key Ktunaxa Nation concerns raised during consultation. A complete list of issues raised by Ktunaxa can be found in Appendix 1: Consultation Tracking Table and on First Nation Rev 6 SharePoint sites.

Table 5: Ktunaxa Nation Concerns

REVELSTOKE 6 KTUNAXA NATION CONCERNS Table 5		
Issues	**KNC Concerns**	**BC Hydro Response**
Confidence in the Assessment	• KNC lacks confidence in the current assessment and BC Hydro's conclusion of non-measurable effects.	• BC Hydro is confident in the science underpinning the findings of non-measurable effects for most VC. There are considerable, valid studies informing the assessment. The methodologies employed are robust and meet professional standards. • BC Hydro respects the fact that First Nations have divergent views and these can be highlighted in Part C of the Application. • The adequacy of the assessment will be reviewed during the Application review process.
BC Hydro's Response to KNC Concerns	• BC Hydro's approach to addressing their concerns falls short of their expectations and impedes their community and leadership's ability to make informed decisions on the Project	• Acknowledged that Ktunaxa should have been satisfied that its concerns had been adequately addressed. Through the development of a separate relationships agreement between the parties, there is a commitment to transparency and to develop an engagement process to ensure mutual and respective interests are meaningfully addressed for all BC

REVELSTOKE 6 KTUNAXA NATION CONCERNS Table 5		
Issues	**KNC Concerns**	**BC Hydro Response**
		Hydro works within Ktunaxa Territory.
Cumulative Effects	• BC Hydro needs to carry the assessment through to a cumulative effects assessment for all VC. First Nations maintain that they cannot be expected to complete Part C without a review of cumulative effects. • Taking it through to cumulative assessment, in light of FN lack of confidence in findings, will help to ensure that worse case scenarios and mitigation measures have been considered for all VCs. FN argue that all effects are significant as many ecological thresholds have been or are at risk of being breached.	• BC Hydro is following the assessment steps and guidance as defined by the EAO. When non-measurable Project effects are determined it is not possible to logically carry forward the assessment through to residual effect evaluation including significance of effect, and then consider cumulative effects.
Establishing Trends	• The assessment fails to recognize trends, therefore BC Hydro needs to recognize the trends and identify in what ways the Project contributes to the projectory of these trends either as neutral, positive, or negative influences.	• The trend analysis is outside the scope of Rev 6 EA process. The discussion on pre-dam conditions and long term concerns about the operation of Revelstoke and other BC Hydro facilities is better addressed through other tables and programs.
Selection of VC	• VCs selected and supporting filed studies do not fully characterize the scope of potential impacts with regard to certain plants and species	• VCs were originally selected during the Core Committee meetings held in March and May 2013. • Modifications to the VCs have been made as a result of discussions with First Nations and Technical Task Groups. Although not all plants and species within the study area were selected, representative species, group and guilds and those species of specific interest have been included.
Water as a VC	• KNC has previously requested Water to be considered as a VC. Water is an intrinsic value for Ktunaxa as part of the creation story and a fundamental component in the EA. Water as a fundamental component pertain to Aboriginal interests, including claimed or	• During the assessment we have considered water as it pertains to all the environmental VCs. We understand that the Ktunaxa will further elaborate on the intrinsic value of water to Ktunaxa and treat water as a VC in their preparation

REVELSTOKE 6 KTUNAXA NATION CONCERNS Table 5		
Issues	**KNC Concerns**	**BC Hydro Response**
	proven Aboriginal rights (including title) and Treaty rights.	of Part C of the REV6 EA application.
dAIR	• Request that the dAIR be amended to make clear that where mitigation measures have not been shown to address effects it cannot be assumed that effects have been adequately mitigated.	• Criteria for evaluation of success of proposed mitigation measures will be provided in the Application
Re-introduction of Salmon	• BC Hydro's approach fails to identify the future reintroduction of salmon into the Upper Columbia River Basin	• This interest is acknowledged; however, anadromous salmon are not included in the scope of the EA. The Project will not preclude the ongoing potential for future fish passage or fish resource use of concern to First Nations. The Canadian Columbia River Intertribal Fisheries Commission (CCRIFC) has proposed the formation of a multiagency committee to start investigating the feasibility of salmon restoration in the Columbia. BC Hydro has agreed to participate in such a committee should it proceed

Table 6 provides a sample of key Ktunaxa Nation concerns raised during consultation. A complete list of issues raised by Okanagan can be found in Appendix 1: Consultation Tracking Table and on First Nation Rev 6 SharePoint sites.

Table 6: Okanagan Nation Concerns

REVELSTOKE 6 OKANAGAN NATION CONCERNS Table 6		
Topic	**Okanagan Concerns**	**BC Hydro Responses**
Impact of Evasive Species	• Okanagan are concerned that impacts of invasive species through increased recreational use are not adequately addressed in the dAIR.	• The dAIR was revised to include the potential introduction for aquatic species. The Environmental Monitoring Plan (EMP) will also address the introduction of invasive species

REVELSTOKE 6 OKANAGAN NATION CONCERNS Table 6		
Topic	**Okanagan Concerns**	**BC Hydro Responses**
		through construction activities
Ongoing effects of Revelstoke operations and facilities	• Okanagan request that BC Hydro take immediate steps to address issues related to failed mitigation measures such as re-vegetation on the Big Eddy Channel.	• The current effects of the Revelstoke facilities are described in existing conditions however the focus of the assessment is on the installation of the sixth unit.
VC Selection	• Add Water Quality and Air Quality as a VC. • Request for more information on hydrological system regulation fragmentation and other water relate changes • Add Indigenous Traditional Use and Intangible Cultural Heritage to the VC selection	• Water was assessed with respect to this Project. However, they are not identified as standalone VCs as they form an intermediate step along the identified pathway of effects. A description of the potential changes in Air and Water Quality as result of the Project will be included in the EA Application. • The dAIR has been updated to include AIR as a VC • The Historical and Archeological VC was, at FN request, separated into First Nations Cultural Heritage, and Historical and Archeological Heritage. • First Nations Cultural Heritage will be assessed in Part C of the Application Historical and Archeological • Heritage will be assessed in Sec 7 of Part B of the Application
Cultural Heritage and Traditional Use	• Cultural Heritage and Traditional Use must be assessed rigorously in the EA process.	• As agreed with First Nations, this material will be assessed in Part C of the application. BC Hydro has established an approach with all potentially affected Aboriginal groups to prepare and write their own effects assessment to be

REVELSTOKE 6 OKANAGAN NATION CONCERNS Table 6		
Topic	**Okanagan Concerns**	**BC Hydro Responses**
		included as Part C of the application. • It is important to note, that in all Project VC effects assessments, current and traditional use by First Nations was considered throughout, where information was available.
Addressing Community Concerns	• Significant changes are determined by the proponent, so how can Okanagan ensure that our communities concerns are adequately addressed.	• BC Hydro will continue to work with communities to understand and find appropriate ways to respond to community concerns.
Traditional Use Studies	• Traditional use studies need to be conducted by First Nation groups not just for Revelstoke Reservoir but expand focus scope to Keenleyside Dam; Dam study area (52 kms) is too small area to focus on.	• BC Hydro provided funding to First Nations for Traditional Use Studies. The First Nation communities define the areas to be studied based on their relationship to the land and resource use.
Significance of Water	• Acknowledgement of the significance of water for Syilx peoples; water management and the protection of aquatic ecosystems need to be addressed.	• BC Hydro acknowledges the importance of water for Syilx people and will continue to seek the input of Syilx in areas of water management and the protection of aquatic ecosystems.
Harvesting and Gathering	• Loss of harvesting and gathering – culturally important plants, animals and minerals (food, sustenance, medicinal, ceremonial).	• Harvesting and gathering to be considered in Part C of the Application.
Capacity Funding	• Piecemeal capacity funding has made it difficult to undertake the writing of Part C of the Application	• BC Hydro has provided or offered funding to ensure nations have adequate funding to effectively participate in the Rev 6 consultation processes and in writing Part C of the Application

REVELSTOKE 6 OKANAGAN NATION CONCERNS Table 6		
Topic	**Okanagan Concerns**	**BC Hydro Responses**
Data Gaps	• Lack of data (current stock assessments and change over time on fish and game) constrains ON in the estimation of Project effects on food security and sufficiency of culture and heritage resources	• BC hydro does not conduct stock assessments. • For game and wildlife BC Hydro relies on the assessment conducted by the BC Conservation Data Centre Results of the 2015 RAP have been provided. (Jan 17/2017) • Archeological assessment work is ongoing and BC hydro will continue to collaborate with First Nations on the development of potential models, assessment fieldwork, mitigation and chance find procedures. • There are a number of relevant WUP and field studies. Links are provided on the SharePoint site
Emergency Management	• Not enough information is provided with respect to emergency management plans and seismic events	• Emergency plans are in place for all facilities and BC Hydro can assist communities in the development of their Emergency Readiness Plans.
Water Licence	• The dAIR does not properly address impacts associated with the increase in water use	• The hydrological changes associated with an increase of 3000cfs is very small and effects are difficult to measure; therefore, the EA considers potential effects for the addition of unit 6 and the additional 3000cfs.
RAP Studies	• 23 new sites were identified in 2016 requiring follow up field work. Without the completion of the RAP studies ON cannot identify the risks to physical and non-physical culture	• BC Hydro will complete ground truthing work in the spring of 2017 and subsequent impact assessment fieldwork. • Results will be shared with interested First Nations.

Table 7 provides a sample of key Secwepemc Nation concerns raised during consultation. A complete list of issues raised by Ktunaxa can be found in Appendix 1: Consultation Tracking Table and on First Nation Rev 6 SharePoint sites.

Table 7: Secwepemc Nation Concerns

REVELSTOKE 6 SECWEPEMC NATION CONCERNS Table 7		
Issue	**Secwepemc Nations' Concerns**	**BC Hydro Response**
Air and Noise	• Air quality and ambient noise are important components of the overall environment and as such, require additional study into the impacts the project activities have had and are likely to have on the health of the surrounding ecosystems on Secwepemc cultural resources.	• The scope of the air and noise study is reasonable considering the nature of the sources; however more information regarding the Secwepemc perspective would be welcome. Measures to address construction related air quality and noise will be included in the Environmental Management Plan.
Hydrology and Fluvial Geomorphology	• A full evaluation of how Rev 6 differs from a more adequate historic baseline would be of more value for the Secwepemc. • It is recognized that the scope of this Environmental Assessment does not consider a natural flow regime as a baseline. Therefore, this fact reinforces the need for robust analysis relative to long term variance and potential future conditions	• The fluvial geomorphology assessment involved analysis of bank erosion susceptibility, changes in channel shape and dimensions, effects of excess shear stress, water level changes, and ramping rates. These analyses were guided by output parameters of the hydraulic models (water surface elevation, flow velocity and shear stress), topographic data provided by bathymetric and LiDAR surveys, and sediment survey data from various sources spanning 2009 to 2016 • (Kerr Wood Leidal 2009; Kerr Wood Leidal 2012; Clague & Roberts 2015; NHC 2016).
Fish Passage	• Concern about the interruption of fish passage and ecological connectivity by the physical infrastructure and operation	• The report on fish passage stated that any changes of turbine design would be small; however, BC

REVELSTOKE 6 SECWEPEMC NATION CONCERNS Table 7		
Issue	**Secwepemc Nations' Concerns**	**BC Hydro Response**
	of the dams can impact the condition and abundance of fish communities. Inability of fish to move upstream through the Mid and Upper Columbia system can cause the isolation of fish populations. This in turn can result in a lack of genetic diversity which in turn reduces a species' ability to fight disease and evolve in response to changing environments.	Hydro is open to evaluating options for improved designs that meet project specifications.
Significance Determination	• What is not factored into the significance determination of many of the aquatic resources is the continued integrity or viability of populations (kokanee, bull trout and burbot) and ecosystems.	• Inputs related to significance determination from First Nations and regulators will be considered and made public and included in the EA.
Ecological Communities	• Additional field efforts need to be made within the project areas to update noxious weed information and rare plant information within prescribed growing seasons (early to mid-growing season). • Baseline information needs to take into account that the true baseline of the ecological communities existed prior to the initial construction of the Project.	• Current baseline conditions were described using available information provided in relevant reports (e.g., CLBMON 36, 39, 40) that help us understand diversity and seasonal use in the areas potentially affected by the Project. Site specific data was supplemented with other existing information and is considered sufficient to understand the potential effects of the Project.
Mammals	• There appears to be a general lack of effort to classify current conditions and multi-season habitat use by Species at Risk (SAR), and wildlife in general. One day in late winter and five days in spring is an insufficient level of effort to observe habitat use by most species present in the area.	• The botanist is confident that the survey timing, while not ideal, was adequate, given the habitat conditions at the site. An additional survey will be done prior to construction. • The approach of the assessment is to identify the habitats present within the Local Study Area (LSA)

REVELSTOKE 6 SECWEPEMC NATION CONCERNS Table 7		
Issue	**Secwepemc Nations' Concerns**	**BC Hydro Response**
		that would be potentially affected with the addition of a sixth unit and that support a variety of species - including species at risk. • The timing of any affect is also considered should it overlap with seasonal use that could cause displacement or mortality. • Information reviewed during assessment of mammals review existing information from the WUP studies (e.g., CLBMON 11B1) and publicly available government data to address abundance and distribution of known occurrences of listed mammal/ungulate species, as well as the abundance, distribution and quality of known suitable habitat for listed mammal/ungulate species.
Socio-community Effects	• Socio-economic is deficient in information • The socio-community appears to have been drafted in a manner to minimize the scoping, presentation of data, and comprehensive assessment of specific effects. This impairs a complete identification and discussion of key issues that need to be covered in the socio-community assessment.	• . There are inherent data challenges in gathering First Nation information. Data provided by Secwepemc will be incorporated into Part B • Where information is available including information presented in Part C of the EAC Application, the Socio-community VC assessment will reflect existing conditions and consider Project-related socio-community effects on Aboriginal groups. • The Socio-community VC assessment includes assessment of potential Project effects on

REVELSTOKE 6 SECWEPEMC NATION CONCERNS Table 7		
Issue	**Secwepemc Nations' Concerns**	**BC Hydro Response**
		Aboriginal Groups, taking into consideration information presented by these Aboriginal Groups in Part C of the Application
Heritage	• The background information presented in the EA represents a misinformed perspective.	• The Heritage VC assessment includes assessment of potential that takes into consideration information and perspectives presented by these Aboriginal Groups in Part C of the Application.
Environmental Management Plans	Environmental monitoring will be a key piece in this project, especially as there is considerable uncertainty surrounding the extent of project-related impacts on ecosystem components. As such, it is imperative that the environmental monitor belong to an environmental professional body (i.e., College of Applied Biology) that is subject to standards of conduct and a code of ethics.	BC Hydro will follow best practices in the development and implementation of the Environmental Monitoring Plan (EMP). The EMP will ensure that proposed development activities are planned and carried out in compliance with the applicable legislation, regulations, and policies that apply to Rev 6, and that monitoring activities will meet applicable standards of conduct and code of ethics.
Cultural Heritage Assessments	• Late funding resulted in an inability to complete a comprehensive culture and heritage assessment	• A supplementary funding agreement has been signed to support a cultural and heritage assessment.
Baseline Assessments	• Lack of baseline information as well as significant gaps in the understanding of the extent and implication of Project effects impedes Secwepemc understanding of Project effects on Secwepemc cultural and natural resources. • Rev 5 baseline does not allow for complete assessment on appropriate thresholds	• The description of existing conditions for most VCs has been amended to include the context of pre-dam conditions and the effects of river regulation where appropriate. • BC Hydro will continue to work with First Nations to address concerns related to baseline information

REVELSTOKE 6 SECWEPEMC NATION CONCERNS Table 7		
Issue	**Secwepemc Nations' Concerns**	**BC Hydro Response**
Residual Effects	• The current approach to characterizing residual effects is deeply flawed in that effects and the effectiveness are merely predictions. • Residual effects must be assessed through long-term adaptive monitoring programs following the application of mitigation, and must be measured against acceptable thresholds for change, • All residual effects must be assessed and considered under a cumulative effects framework.	• BC Hydro is following the EAP guidelines for the identification and assessment of residual effects
Archeological Sites	• Mitigations to address adverse effects to known archaeological resources must be completed.	• Mitigation plans in development (extensive consultation with FN has occurred)
LSA and RSA	• Assessment based on a specific development footprint area, marginalizes the complexities of the cultural and spiritual relationship with the land resulting adverse effects on Secwepemc Title & Rights	• BC Hydro acknowledges this frustration; however, the scope of the EA is limited to the REV6 Project. • BC Hydro will continue to work with First Nations to address concerns regarding its operations.

Revelstoke Unit 6 Project

Aboriginal Consultation Report 1

APPENDIX A

Comment Tracking Table updated February 10, 2017.

REV6 Comments Tracking Table
All dAIR Comments Received Prior to End of August 2016

NO	DATE	COMMENTS ORIGINATED		Topic Subject	Comments	RESPONSE	If unsatisfactory - Comments	Responses
		Name	Affiliation			What		
184	March 9/10, 2016	Craig Candler	Ktunaxa Nation Council	Minimal change for Revelstoke Reservoir levels	Request Clarification: "Revelstoke Reservoir levels fluctuate throughout the day in response to generation discharge from Revelstoke and Mica Generating Stations. BC Hydro generally operates the reservoir level within 1.5 metres from full pool to maintain head and maximize power generation from Revelstoke Generating Station. Operation of the sixth generating unit would be expected to only *"cause small changes to the timing and amount of water level fluctuation within the current 1.5 metre operating range"* under normal conditions. BC Hydro would continue to occasionally operate Revelstoke reservoir at a lower minimum level during cold weather or unusual system conditions. (Revelstoke 6 Fact Sheet, p. 3, italics added)	Correction; normal operating range is 571.5 m to 573 m. There would be no change to normal operating range, and daily fluctuations would be similar for REV5 and REV 6. However, on rare occasions during winter, the increase in daily fluctuations could be up to 0.2m.		
185	March 9/10, 2016	Craig Candler	Ktunaxa Nation Council	erational Effe	Based on these sources, our understanding is that the Revelstoke 6 Project is anticipated to result in increase daily fluctuation of the Revelstoke Reservoir by up to 0.2 meters, occurring primarily in the winter when local inflows are low. Please let us know if this understanding is correct so that we can know to include a pathway for Project effects related to increased frequency of diurnal water level fluctuations in the Revelstoke Reservoir of up to 0.2m in winter. For greater clarity, based on experience in other reservoirs, while we understand that the changes would be within the 1.5 m operational range, we would anticipate this Project effect to influence winter build up of hanging ice on reservoir shorelines, and increased diurnal freeze/thaw action within the 1.5m operational range. These effects may be important as they may impact a number of VCs including: 1) ability of wildlife to use shorelines and make water crossings in winter. Depending on shore conditions and	There will be no change to normal operating range, and daily fluctuations would be similar for REV5 and REV 6. However, on rare occasions during winter, the increase in daily fluctuations could be up to 0.2m. These rare fluctuations will not effect wildlife. Reservoir ice was assessed in REV 5 with regard to potential effects to wildlife and this was determined to not be an issue. This is not considered to be an issue as Revelstoke Reservoir does not freeze over other than in isolated bays and inlets around and north of Downie Arm. The findings of REV 5 assessment indicated that there were no effects on furbearers related to reservoir levels. Effects on reservoir Archaeology sites will be assessed in EA.		
186	2016, April 28	Nicole Kapell	Ktunaxa Nation Council		It is disappointing to note that the substantive comments provided by the Ktunaxa on the AIR in round 1 review for multiple sections – including biophysical, economic and social components – have to a large extent not been integrated into the draft AIR document at this stage. Please review the past comments, and either incorporate or provided responses regarding why they were not incorporated in this version of the AIR as they cannot all be repeated again in this Table.	This tracking table incorporates comments recieved from First Nations, Core Committee, regulators and stakeholders. BC Hydro commits to provide clarity on how previous comments provided in 2014 and 2015 on earlier versions of the VC and dAIR have been addressed prior to finalizing the AIR.		We have confirmed that all comments received from KNC are included in this table and the Master Tracking Table.
187	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Purpose of the Application	The third bullet referring to parties and their qualifications should include whether each party is a member of a professional organization in BC. This is relevant in terms of any future queries with respect to the validity of their assessments, and any follow-up required.	The EAC Application will include contributors professional organizations, where relevant.		
188	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Description of the Project	Under Government Revenues, please require inclusion of First Nation Governments and require a summary of revenues or other benefits by First Nation for all phases of the Project.	BC Hydro will discuss the inclusion of this informaion with First Nations as the information becomes available.		BC Hydro will discuss the inclusion of this information with First Nations as the information becomes available.
189	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Description of the Project	Under Project Location, please require a description, including maps, of all water bodies,managed or unmanaged, and above or below the Project, where water level, temperature, speed or other characteristics will change as a result of the Project.	A figure describing the location of the Project and surrounding water bodies will be included in the EACA.		Spatial boundaries of the Project are set out in Section 3.2 of the dAIR and includes all water bodies above and below the project. The hydrological context is set out in Section 4.1 of the dAIR. All water bodies potentially interacting with the Project are discussed in Section 4.1 of the EA.
190	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Alternatives to the Project	Please include a 'no new development' alternative, including discussion of environmental benefits (bank stability, avoided risk to sturgeon spawning, etc.) or lost opportunities that would accrue as a result of the Project not proceeding	A no new develoment scenario is described in the Rev 5 EACA as well as within each baseline section of the Effects Assessment in the EACA.		

REV6 Comments Tracking Table
All dAIR Comments Received Prior to End of August 2016

NO	DATE	COMMENTS ORIGINATED		Topic Subject	Comments	RESPONSE	If unsatisfactory - Comments	Responses
		Name	Affiliation			What		
191	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Proposed Project Overview	Section 2.2 The Proponent should include a link to the Project Description in this section of the AIR. Section 2.2.7 Hydrology and River Behaviour; • p. 8. A section should be added to include a description of hydrologic and river behaviour conditions before Revelstoke 5 and immediately after, in order to anticipate incremental changes to the Middle Columbia River. This will be important for reducing uncertainty, planning restoration and/or mitigations for specific changes to hydrology and river behavior as well as fisheries, safety of river users and other issues of importance to the Ktunaxa. • Please provide information on the condition of the river prior to regulation of the river (a pre-development baseline). • It would be useful to undertake a study on how reservoir levels and MCR channels have changed over time (retrospective study using aerial photographs from pre-Revelstoke Dam), how these changes have influenced indigenous use of the river and whether actual impacts are within the bounds of what was predicted for Rev 5. Section 2.6 Project Land Use:	Section 4.1.1. of the Application includes information on river behaviour prior to Rev 5. Section 6.2 Socio-community Assessment and Section 6.3 Land and Resource Use will consider potential First Nations land use plans overlapping the study areas as sources of information. Effects on First Nations related to land use will be addressed in Part C of the Application.		A link to the Project Description is provided in Section 1.1 of the dAIR. The dAIR has been updated to include hydrological conditions of the Columbia River pre and post river regulation in Section 4.1 of the dAIR. Section 4.1.1. of the Application includes information on river behaviour prior to Rev 5. Section 6.2 Socio-community Assessment and Section 6.3 Land and Resource Use of the EA considers potential First Nations land use plans overlapping the study areas as sources of information. A review of historically channel mapping using historical aerial photos was completed for the assessement. First Nations related land use plans, areas of use and existing agreements will be provided in Part C of the Application.
192	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Issues Scoping and Selection of VCs	Clarify that assessment requirements identified in the AIR apply to all VCs identified in table 3 (Section B VCs) as well as all VCs identified by Aboriginal Groups (Section C VCs).	The assessment requirements apply to all VCs in Section B and generally apply to the VCs in Part C though there may be variations based on the direction and requirements of First Nations authoring these sections.		0
193	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Assessment Process	In Section 3.1.1., on P. 7, the second bullet should provide a table of candidate VCs proposed for inclusion by the Advisory/Working Group & Core Committee that were not selected as final VCs as well as the a rationale with reasons for not including them.	Candidate VCs identified at the time of writing are presented in Appendix A of the dAIR. Where they have not been selected as VCs a rationale has been presented. How Candidate VCs identified after the dAIR was drafted have been addressed will described in this Tracking table.		Candidate VCs identified at the time of writing are presented Table 1 in Appendix A of the dAIR. Where they have not been selected as VCs a rationale has been presented. How Candidate VCs identified after the dAIR was drafted have been addressed will described in this Tracking table.
194	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Assessment Process	In Table 3.1.1, Size and age distribution should also be used as indicators for fish. Condition is only one indicator of fish health. Size distribution is an indicator of growth rate and prey availability; age distribution is an indicator of the resilience of the population.	Part of the methodology for choosing indicators is the availability of information and the ability to provide and adequate measure. The indicators chosen partially reflect the kind of data available. While size and age data are important in fisheries, these data are not normally readily available for most species, require a longer time series, and therefore, are not usually of a quality that could be reliably used as an indicator.		0
195	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Assessment Process	In Table 3.1.1, indicators for provincially listed ecosystems should include the spatial distribution (as opposed to just location), condition (species composition and % cover for endemic and weed species), quantity and availability (inundation frequency, depth, and duration).	Spatial distribution has been addressed by summarizing broad vegetation types within elevation bands in the Draw Down Zone (DDZ). Comparisons of inundation frequency, depth and duration have been provided in tabular format in the Ecological commmunities chapter		Spatial distribution has been addressed by summarizing broad vegetation types within elevation bands in the Draw Down Zone (DDZ). Comparisons of inundation frequency, depth and duration have been provided in tabular format in the Ecological Communities (Section 4.3) of the EA.
196	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Assessment Process	In Table 3.1.1, indicators for sensitive ecosystems should include the spatial distribution (as opposed to just location), condition (species composition and % cover of natural and weedy species), quantity and availability (inundation frequency, depth, and duration).	Section 4.3 provides a summary of the various habitats found within the Local Study Area (LSA) (including quantity), the spatial location of the larger wetland complexes specifically requested by Core Committee members, and the availability (when first inundated, the depth, and how long).		Section 4.3 of the EA provides a summary of the various habitats found within the Local Study Area (LSA) (including quantity), the spatial location of the larger wetland complexes specifically requested by Core Committee members, and the availability (when first inundated, the depth, and how long).
197	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Assessment Process	In Table 3.1.1, indicators for ecosystem health and function for biodiversity should include both the spatial extent and structure of all ecosystems and habitats (i.e., the extent may not change much, but the structure may and both are important)	Section 4.3 provides a summary of the various habitats found within the Local Study Area (LSA) (including quantity), the spatial location of the larger wetland complexes specifically requested by Core Committee members		Table 2 of Section 3.1 of the dAIR has been updated to include an indicator to review current and anticipated changes to the spatial extent fo all ecosystems and habitats, including vegetation. Section 4.3 provides a summary of the various habitats found within the Local Study Area (LSA) (including quantity), the spatial location of the larger wetland complexes specifically requested by Core Committee members

REV6 Comments Tracking Table
All dAIR Comments Received Prior to End of August 2016

NO	DATE	COMMENTS ORIGINATED		Topic Subject	Comments	RESPONSE	If unsatisfactory - Comments	Responses
		Name	Affiliation			What		
198	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Assessment Process	In Table 3.1.1, indicators for federal or provincial listed plants should include "abundance and distribution of known occurrences of listed species". Note that "presence, quality and quantity of suitable habitat" for listed plants is not a valid indicator based on site series modeling because rare plant occurrence is poorly correlated with site series and rare plants are often associated with microhabitat conditions that are hard to predict. These characteristics cannot be modeled (according to provincial experts J. Penny, Botanist, CDC and D. MacKillop, Regional Ecologist, FLNRO); therefore a field verification step would need to be performed to determine the proportion of polygons that actually support rare plants.So if the second indicator is included, it should read "abundance, distribution and quality of suitable habitat for listed species, based on verification."	Broad habitat types are useful for identifying 'potential' habitats for rare plants, and botanists commonly use those habitat types to prioritize areas for rare plant surveys. The one known occurrence of a rare plant (moss grass) is discussed in Section 4.4 which states: "the occupied area 'approximately 550 m x 120 m (~7 ha)'. Although population size was not estimated, the total number of individuals was given as 'likely in the tens of thousands'." There is also further discussion of the type of habitat where the population is found.		
199	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Assessment Process	In Table 3.1.1, indicators for federal or provincial listed herptiles should include "abundance and distribution of known occurrences of listed species" and "abundance, distribution and quality of suitable habitat for listed species" (it is not enough to say habitat presence; the distribution of that habitat is important in terms of linkages and connectivity, as previously indicated, so please change this).	Section 4.5 discusses where herptile species have been observed within the MCR (Table 4.5-4), thereby addressing species distribution. Abundance estimates for all species at risk are difficult to determine as variation between years and sites and detectability of many species make it difficult to be certain on exact numbers. The approach of the assessment is to identify the habitats present within the Local Study Area (LSA) that would be potentially affected with the addition of a sixth unit and that support a variety of species - including species at risk. Should these important habitats be measurably affected then species themselves that are known to occur in these habitats could also be affected. The timing of any affect is also considered should it overlap with seasonal use (e.g., breeding) that may cause displacement or even mortality.		Section 4.5 discusses where herptile species have been observed within the MCR (Table 4.5-4), thereby addressing species distribution. Abundance estimates for all species at risk are difficult to determine as variation between years and sites and detectability of many species make it difficult to be certain on exact numbers. The approach of the assessment is to identify the habitats present within the Local Study Area (LSA) that would be potentially affected with the addition of a sixth unit and that support a variety of species - including species at risk. Should these important habitats be measurably affected then species themselves that are known to occur in these habitats could also be affected. The timing of any affect is also considered should it overlap with seasonal use (e.g., breeding) that may cause displacement or
200	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Assessment Process	In Table 3.1.1, indicators for federal or provincial listed birds should include "abundance and distribution of known occurrences of listed species" and "abundance, distribution and quality of suitable habitat for listed species" (it is not enough to say habitat presence; the distribution of that habitat is important in terms of linkages and connectivity, as previously indicated, so please change this). Same comment for raptor species.	Section 4.6 discusses where bird species at risk and raptors have been observed within the MCR (Section 4.6.2.2.1), thereby addressing species distribution. Abundance estimates for all species at risk are difficult to determine as variation between years and sites and detectability of many species make it difficult to be certain on exact numbers. The approach of the assessment is to identify the habitats present within the Local Study Area (LSA) that would be potentially affected with the addition of a sixth unit and that support a variety of species - including species at risk. Should these important habitats be measurably affected then species themselves that are known to occur in these habitats could also be affected. The timing of any affect is also considered should it overlap with seasonal use (e.g., breeding) that may cause displacement or even mortality.		Section 4.6 discusses where bird species at risk and raptors have been observed within the MCR (Section 4.6.2.2.1), thereby addressing species distribution. Abundance estimates for all species at risk are difficult to determine as variation between years and sites and detectability of many species make it difficult to be certain on exact numbers. The approach of the assessment is to identify the habitats present within the Local Study Area (LSA) that would be potentially affected with the addition of a sixth unit and that support a variety of species - including species at risk. Should these important habitats be measurably affected then species themselves that are known to occur in these habitats could also be affected. The timing of any affect is also considered should it overlap with seasonal use (e.g., breeding)
201	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Assessment Process	In Table 3.1.1, indicators for federal or provincial listed mammals should include "abundance and distribution of known or expected occurrences" and "abundance,distribution and quality of suitable habitat for foraging and winter range (it is not enough to say habitat presence; the distribution of that habitat is important in terms of linkages and connectivity, as previously indicated, so please change this).	Section 4.7 discusses where mammal species at risk have been observed within the MCR (Section 4.7.2.2.1), thereby addressing species distribution. Abundance estimates for all species at risk are difficult to determine as variation between years and sites and detectability of many species make it difficult to be certain on exact numbers. The approach of the assessment is to identify the habitats present within the Local Study Area (LSA) that would be potentially affected with the addition of a sixth unit and that support a variety of species - including species at risk. Should these important habitats be measurably affected then species themselves that are known to occur in these habitats could also be affected. The timing of any affect is also considered should it overlap with seasonal use that may cause displacement or even mortality. The dAIR currently has 'presence		Section 4.7 discusses where mammal species at risk have been observed within the MCR (Section 4.7.2.2.1), thereby addressing species distribution. Abundance estimates for all species at risk are difficult to determine as variation between years and sites and detectability of many species make it difficult to be certain on exact numbers. The approach of the assessment is to identify the habitats present within the Local Study Area (LSA) that would be potentially affected with the addition of a sixth unit and that support a variety of species - including species at risk. Should these important habitats be measurably affected then species themselves that are known to occur in these habitats could also be affected. The timing of any affect is also considered should it overlap with seasonal use that may cause displacement or even mortality

REV6 Comments Tracking Table
All dAIR Comments Received Prior to End of August 2016

NO	DATE	COMMENTS ORIGINATED		Topic Subject	Comments	RESPONSE	If unsatisfactory - Comments	Responses
		Name	Affiliation			What		
202	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Assessment Process	Why are listed invertebrates not included as a VC, as recommended by the Ktunaxa? Under federal and provincial legislation, these listed species have the same regulatory requirements as vertebrates. Why are cavity nesters not included as VCs? The flooding and regulation of reservoirs has had profound impacts on cavity nesters and their wildlife tree habitat along the reservoir and much like raptors, this guild should be a focus of concern for this project.	The valued components selected are representative of the environmental values affected by the Project and were determined through discussions with FN and representatives and stakeholders. The assessment of project effect on VCs provide a robust description of the environmental effects of the Project. The CDC has no records of any of the listed species potentially present (based on habitat type) anywhere near Revelstoke Reach and these have not been the focus of any WUP program within the MCR. Cavity-nesting birds are considered within the broader subcomponent of 'migratory birds'		The valued components selected are representative of the environmental values affected by the Project and were determined through discussions with FN and representatives and stakeholders. The assessment of project effect on VCs provide a robust description of the environmental effects of the Project. The CDC has no records of any of the listed species potentially present (based on habitat type) anywhere near Revelstoke Reach and these have not been the focus of any WUP program within the MCR. Cavity-nesting birds are considered within the broader subcomponent of 'migratory birds'. There are no CDC location records for any listed invertebrate species within the two Project LSAs, i.e., the Generation and Transmission LSAs. • The draft EA references invertebrates in Section 4.2, Fish and
203	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Assessment Process	In Table 3.1.1 under ungulates, indicators should include abundance, distribution and diversity of ungulate species and their movement corridors". Second indicator should read "abundance, distribution and quality of winter range habitat. (it is not enough to say habitat presence; the distribution of that habitat is important in terms of linkages and connectivity, as previously indicated, so please change this).	Project effects will not occur within UWR. "Abundance" of habitat and potential effects on it are discussed in Section 4.3.		Project effects will not occur within UWR. "Abundance" of habitat and potential effects on it are discussed in Section 4.3 of the EA.
204	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Assessment Process	In Table 3.1.1, for the mammal guild, the Ktunaxa have clearly indicated in past comments that they want to see furbearers included as a sub-component, with an associated first indicator of abundance, distribution and diversity of furbearer species'. Second indicator should read "abundance, distribution and quality of habitat".	Furbearers are included in Section 4.7 but no data are available for population abundance or distribution. Habitat within the Local Study Area (LSA) is quantified in Section 4.3 - including a discussion of spatial distribution.		
205	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Assessment Process	In Table 3.1.1, under hydrology and fluvial geomorphology, why is only MCR considered when project description projections clearly state that RR will experience up to a 20 cm decrease in water levels in winter months during low water periods, with implications for ice formation/failure?	There will be no change to normal operating range, and daily fluctuations would be similar for REV5 and REV 6. However, on rare occasions during winter, the increase in daily fluctuations could be up to 0.2m. This is not considered to be an issue as Revelstoke Reservoir does not freeze over other than in isolated bays and inlets around and north of Downie Arm.		
206	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Assessment Process	In Table 3.1.1, under traffic, an associated subcomponent should be federally and provincially listed species (all vertebrates and invertebrates) migratory birds, raptors,ungulates, furbearers, and culturally important species.	Roadkill is discussed in the herptile, bird and mammal sections. Roadkill impacts to invertebrates (both baseline and predicted effetcs related to the Project) would be difficult to report.		
207	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Assessment Process	Section 3.1.1, Table 3 (Valued Components, Sub-components, indicators, by Phase and Project area) - Under ecological communities, change "Traditional Use and Knowledge" to "Culturally Important Ecosystems and Indigenous Knowledge" - Under plants, change "Traditional Use and Knowledge" to "Culturally Important Plants and Indigenous Knowledge" - Make this change to require recognition of indigenous knowledge for all relevant components and sub-components (herptiles, birds, mammals) Under hydrology and fluvial geomorphology, be clear about which side channels and wetlands will be monitored for water levels. Selection to be done with advice from Ktunaxa knowledge holders	For further discussion with First Nations and the EAO. Water Monitoring stations have been identified and mapped based on input from Core Committee.		
208	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Table of VCs	Please add all VCs identified by Aboriginal Groups (Section C VCs) to this table, or otherwise recognize Aboriginal rights and interests as full valued components for this assessment.	We will consider all VCs identified by Aboriginal Groups in Section C for linkages to or inclusion in Part B.		All proposed VCs, including those identified by Aboriginal Groups, are summarized in Table 1 of Appendix A of the dAIR which also summarizes rationale for inclusion or exclusion as a VC.

REV6 Comments Tracking Table
All dAIR Comments Received Prior to End of August 2016

NO	DATE	COMMENTS ORIGINATED		Topic Subject	Comments	RESPONSE	If unsatisfactory - Comments	Responses
		Name	Affiliation			What		
209	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Assessment Boundaries	Table 4: Please include the area where direct Project effects are anticipated above the dam in Revelstoke Reservoir (up to 20cm change per the PD) in the LSA for all wildlife and vegetation VCs, as well as for archaeology, and land use (winter travel effects).	Core Committee discusions have generally focused on potential effects downstream of Revelstoke Dam. In the REV 5 EA potential effects within the Revelstoke Reservoir were considered but were found to be negligible or none. There will be no change to normal operating range, and daily fluctuations would be similar for REV5 and REV 6. However, on rare occasions during winter, the increase in daily fluctuations could be up to 0.2m. These rare fluctuations will not effect wildlife. Effects on reservoir Archaeology sites will be assessed in EA.		Detailed descriptions of the Local Study Area are provided in Table 3 of Section 3.2 of the dAIR. Core Committee discusions have generally focused on potential effects downstream of Revelstoke Dam. In the REV 5 EA potential effects within the Revelstoke Reservoir were considered but were found to be negligible or none. There will be no change to normal operating range, and daily fluctuations would be similar for REV5 and REV 6. However, on rare occasions during winter, the increase in daily fluctuations could be up to 0.2m. These rare fluctuations will not effect wildlife. Effects on reservoir Archaeology sites will be assessed in EA.
210	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Assessment Process	Section 3.2 Assessment Boundaries - It is critical to include a pre-dam construction baseline as an important starting point for discussion of each VC. This context is necessary because existing dams and associated reservoir operations have had dramatic effects on area ecosystems, habitats and species, potentially already resulting in changes that are outside the natural range of variability (i.e., surpassing ecological thresholds) for a number of VCs, and particularly those that are already rare and/or of conservation concern. Section 3.2.2, Table 4 Assessment Boundaries - Please provide a rationale for 500 m boundary for ecological communities, plants, herptiles, birds, mammals relative to the RR. How does this address drying of wetlands and tributaries that may be affected by fluctuating water levels? LSA boundaries may need to follow tributaries that may be impacted upstream of the generating station.	Pre dam conditions are discussed for the VCs in the draft Application as they contribute to the overall understanding of the VCs context. However, there are no quantitative data available on pre-dam populations of wildlife, and very little quantitative data available pre-dam in general. The 500 m is reflective of discussions with the Core Committee and TTG. Revelstoke Reservoir will continue to operate as current and tributaries will not be affected.		Pre dam hydrology will be provided in Section 4.1 of the EA as outlined in Section 4.1 of the dAIR. Pre dam conditions are discussed for the VCs in the draft Application as they contribute to the overall understanding of the VCs context. However, there are no quantitative data available on pre-dam populations of wildlife, and very little quantitative data available pre-dam in general. The 500 m is reflective of discussions with the Core Committee and TTG. Revelstoke Reservoir will continue to operate as current and tributaries will not be affected.
211	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Assessment Process	Section 3.3 Existing Conditions: - As stated previously, including a pre-dam context discussion which refers to the natural range of variability and ecological thresholds for each VC (and how much the current condition of the VC has strayed from that) is critical for understanding the actual impacts to each VC of the Revelstoke 6 Project. Confining this discussion to Revelstoke 5 forward is not adequate.	Pre dam conditions are discussed for the VCs in the draft Application as they contribute to the overall understanding of the VCs context. However, there are no quantitative data available on pre-dam populations, and very little quantitative data available pre-dam in general.		
212	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Assessment Process	3.1, Following table, include - 'identification of threshold of significance for each VC' as a 6th bullet - Following residual effects characterization, please require a description of the level of confidence for each finding OR remove the text following the table as it is duplicating what is already required under 3.6	The text in Sections 3.6 and 3.8,and 3.9 address these points, and while there is some duplication between section 3.1 and the subsequent sections it is helpful to emphasize important steps in the assessment process.		A bullet regarding the threshold of significance has been added and the duplicate text has been removed from Section 3.1 of the dAIR.
213	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Assessment Methodology	3.2.2 , Table 4, under health pillar, please include an LSA for the generation component to confirm that health effects on the MCR, including Arrow Lakes, will be considered (e.g. methylmercury in fish or traditional foods, effects on ice dynamics and public safety) Table 4: The temporal boundary for impact to archaeological sites should be in perpetuity. These are non-renewable resources and cannot be recreated after impact.	No potential interactions between the addition of the 6th unit and presence of methyl mercury or ice dynamics are expected. The temporal boundary for archaeology reflects project duration and will be amended to also reflect the non renewable nature of heritage resources.		Spatial and temporal effects for the assessment are detailed in Table 3, Section 3.2 of the dAIR. A discussion of methyl mercury has been added to the Human Health section of the EA and is noted in Section 8.2 of the dAIR. Effects related to ice dynamics are not expected to change with the addition of the sixth unit. The temporal boundaries for archaeology presented in Table 2 of Section 3.1 of the dAIR reflects the life of the project. Section 7.2 of the dAIR has been updated to reflect the non-renewable nature of historical and archaeological resources.
214	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Assessment Methodology	3.3, Under Existing Conditions, please require a table of predictions made and mitigations undertaken for the Rev 5 Project for all VCs, and provide, for each, all available evidence of how Rev 5 has actually performed on that parameter.	BC Hydro will provide this table		BC Hydro provided this table to First Nations in September 2016.
215	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Assessment Methodology	3.3, Under bullet four, please specify that the Proponent must consider if and how change has occurred from a pre-development baseline, and if that change has already been significant. The pre-development baseline should reflect pre-Columbia regulation conditions (i.e., presence of salmon), and pre-Revelstoke Dam conditions.	This would entail a distinct environmental assessment of the dam development itself and is beyond the scope of this assessment. Pre dam conditions are described for VCs as appropriate (e.g. Birds, Fish, etc)		

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NO	DATE	COMMENTS ORIGINATED		Topic Subject	Comments	RESPONSE	If unsatisfactory - Comments	Responses
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216	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Assessment Process	Section 3.3, Table 5: Standards and Guidance Table - Please include a reference for sampling quality of culturally important plants in this table - For each section of this table, please include Indigenous Knowledge provided by First Nation as a required input under the 'survey' column - In Table 5, please be more specific about the surveys and when (year/month) and where (construction/transmission LSA) for each VC. Also provide assurances that they comprehensively cover off the full LSA (500 m minimum), as opposed to a smaller segment of the LSA. - It seems that in many cases, current targeted surveys are not being done for this assessment. Instead, past studies are being relied upon to extract relevant information for this EA. Unfortunately, these external studies often pre-date REV5 and/or they have different objectives, and a different study area boundary, which is typically confined to the DDZ or a smaller segment of the larger LSA. Please require that "where earlier studies are relied upon, these will be	Indigenous Knowledge is incorporated as information is provided through discussions with First Nations and Part C. The studies completed for the WUP and other programs included considerable effort within the Local Study Area (LSA) and data collected are sufficient to inform the EA. RISC standards are not cited because targeted wildlife surveys were not carried out for the purposes of the assessment for any species other than songbirds, Flammulated Owl and Williamson's Sapsucker, which were done at the Capacitor Station site. Those surveys were done according to RISC methodologies as described in the EA. Most of the area within the 500 m buffer is private land and surveyors remained on the BC Hydro owned property. The site specific data supplemented with other existing information related to this eco-system is sufficient to understand the		
217	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Mitigation Measures	Please add a bullet requiring a description of what input was received from First Nations and how or if it was considered in the determination of mitigations Where mitigations to Project effects are uncertain or not possible, require consideration of offsetting options to redress legacy effects of nearby past projects.	While a bullet has not been added to the dAIR, First Nations will have the opportunity to provide input on mitigation before it is finalized in the Application.		A bullet has been added to Section 3.5 of the dAIR indicating that mitigation measures proposed by First Nations will be included in the EA.
218	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Assessment Process	Section 3.8: Proponent's Determination of Significance - A determination of significance requires inclusion of a detailed explanation of assumptions for each VC, including any ecological/population thresholds considered in determining the current status or condition of a VC. By definition, any listed species are already considered to have surpassed criteria for one or more ecological/population thresholds, as defined by COSEWIC or the CDC, and this must be acknowledged. - Please include language to explain that the Ktunaxa will provide their own determination of significance for cultural VCs.	Significance criteria have been presented in the AIR and described in greater detail in the draft Application. Criteria associated with listed species will be described as appropriate. FN will provide their determination of impacts on rights and title in Part C		
219	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Assessment Process	Section 3.10: Cumulative Effects Assessment - Please provide more specific information on "Timber Harvesting" activities; what timeframe of future harvesting will be included in the assessment given that a 70 year time-frame is needed? - If site-specific quantitative information on future harvesting blocks is not available, then assumptions will need to be made on future harvesting (e.g., all mature timber in the operable portion of a landscape unit will be harvested at or before the time of maturity,etc.). It is not acceptable to simply ignore future harvesting if site-specific cutting plans are not made available by licensees. - What does Begbie Creek refer to as a future project; please provide more information. - It is difficult to understand how the effects of Mica Units 5 and 6 can be incorporated into the baseline with sufficient relevant information as commencement of operation of the 6th unit is not expected until late 2015. Impacts of Mica 5 and 6 operations should be considered in the context of reasonably foreseeable projects, because the cumulative effects assessment will be relying on	1) timber harvest information where relevant will reference available information regarding likely harvesting plans over the timeframe of effects that may be acting cumulatively with project related effects. 2) Understood, and reasonable assumptions about future harvesting will be made as necessary 3) Begbie Creek is an independent power project proposed in 2011. We are investigating whether this project is still in development (4) The predicted operations of the Revelstoke Dam have also assumed the operation of Mica 5 & 6 (5) These will be considered as appropriate if sufficient information can be gathered.		
220	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Assessment Process	Please include a requirement to consider the effects of the environment on the Project, and specifically, how reasonably foreseeable or predictable climate change will, or is anticipated to, contribute to cumulative effects. The cut-off date for incorporating new projects into the cumulative effects assessment is stated as December 31st, 2015. This date should be changed as we have not been able to review the project list until now, and may have suggestions for further projects. For example, on March 9th, 2016 the KNC requested that the project consider a scenario where anadromous salmon are present in the Mid-Columbia River (see next comment). Please also include a requirement to evaluate the effects of, or performance of, the Project in a reasonably foreseeable future scenario where anadromous salmon are present in the mid-Columbia River.	Effects of environment on the Project will include a discussion of climate change. We have not received any comments on other projects to date, but can consider inclusion of additional projects and information up to September 30th, 2016. Revelstoke Unit 6 project activities and operations will not preclude the ongoing potential for future fish passage or fish resource use of concern to First Nations. The Canadian Columbia River Intertribal Fisheries Commission (CCRIFC) has proposed the formation of a multiagency committee to start investigating the feasibility of salmon restoration in the Columbia. BC Hydro has agreed to participate in such a committee should it proceed.		Effects of environment on the Project will include a discussion of climate change (Section 10 of the dAIR). The date was extended to September 30th, 2016 and the list of projects considered for cumulative effects has been updated. Revelstoke Unit 6 project activities and operations will not preclude the ongoing potential for future fish passage or fish resource use of concern to First Nations. The Canadian Columbia River Intertribal Fisheries Commission (CCRIFC) has proposed the formation of a multiagency committee to start investigating the feasibility of salmon restoration in the Columbia. BC Hydro has agreed to participate in such a committee should it proceed.
221	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Assessment Methodology	Section 4.2.1.2 Temporal Boundaries - Please see earlier comments regarding temporal boundaries and the need to discuss a pre-dam baseline condition for all relevant VCs	Pre dam conditions are discussed for the VCs in the draft Application as they contribute to the overall understanding of the VCs context.		Pre-dam conditions are considered in the baseline for context. The baseline for the Application is the existing Revelstoke Generating Station facility with 5 operating units (REV 5).

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222	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Assessment Methodology	Section 4.2.5 Residual Effects and their Significance - This section outlines the proposed approach for finding a significant residual effect to a VC sub-component within the LSA. Please include language to clarify that all VCs for which a residual effect is identified will be considered under the cumulative effects assessment, whether the effect is determined to be significant or not. - The text states "any residual effect will be determined to be significant if the effect could threaten sustainability of a VC sub-component within the LSA." Please define what is meant by sustainability here. Continued cultural use is an important aspect of this consideration for all cultural VCs and sub-components. - The section describes how thresholds for effects on fish and fish habitat, as well as water quality parameters, will be identified. Please describe how thresholds for other VCs will be identified, and whether they will be qualitative or quantitative. - The text proposes "that any residual effect will be determined to be significant if the effect could threaten sustainability of a VC	if the Project is expected to result in a residual effect on a VC, it will be considered for a cumulative effects assessment. The process for scoping the assessment is described further in the EAO's guideline for the selection of valued components and assessment of potential effects, Section 3.5.5 : http://www.eao.gov.bc.ca/pdf/U224EAO_Valued_Components_Guideline_2013_09_09.pdf; In general, sustainability is defined as the maintenance of a species population or associated habitats at a size that ensures persistence of current use and occurrence at or near current levels. BC Hydro acknowledges the Ktunaxa perspective on significance criteria, and has provided greater detail on the evaluation of potential effects on listed species in the Application. Sustainability in the context of significance is explained for relevant VCs in Part B of the Application		Cumulative effects are only considered for residual effects as per the EAO guidance, Section 3.5.5 : http://www.eao.gov.bc.ca/pdf/U224EAO_Valued_Components_Guideline_2013_09_09.pdf; Thresholds of significance will be developed as outlined in each of the VC Sections in the dAIR. In general, sustainability is defined as the maintenance of a species population or associated habitats at a size that ensures persistence of current use and occurrence at or near current levels. BC Hydro acknowledges the Ktunaxa perspective on significance criteria, and has provided greater detail on the evaluation of potential effects on listed species in the Application. Sustainability in the context of significance is explained for relevant VCs in Part B of the Application. The Heritage and Archaeology
223	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Assessment Methodology	Section 4.3 Ecological Communities: 4.3.1.1 Spatial Boundaries - As noted above, KNC are concerned that the effects of water fluctuation and drying of tributaries / wetlands adjacent to the reservoir may impact ecological communities that are greater than 500 m away. It may be necessary to include the tributaries and a spatial buffer around them, as well as wetlands that are within up to 1 km. Please provide a rationale for the 500 m buffer, based on the extent of potential effects from changes in the water levels. - The proposed RSA may need to be modified if the size of the RSA relative to the LSA is too large, as this ratio has the potential to dilute effects. From a cultural use perspective, it is important to be able to access specific places and not always possible or acceptable to go elsewhere. Impacts to culturally important ecosystems must be discussed from this perspective, rather than the perspective of the supply of these ecosystems at the scale of the RSA	The 500 m is reflective of discussions with the Core Committee and TTG. Revelstoke Reservoir will continue to operate as current and tributaries will not be affected. We believe the selection of Local Study Area (LSA) and RSA reflect a reasonable area to review the potential interactions of the Project and environmental issues of concern. Should further information become available we will consider adjusting the areas as appropriate		
224	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Assessment Methodology	Section 4.3.2 Existing Conditions - The section states that "known occurrences and range extents of rare and sensitive habitats will be identified and mapped based on information from existing reports for all study areas and Project-specific surveys completed at the capacitor site." There appears to be no field work specifically conducted for the proposed Project other than at the capacitor station (not 500 m around it though) for a small portion of the 500 m generation LSA. Past information from existing studies was not gathered across the entire 500 for the entire construction/operation LSA. All data seems to be confined to the DDZ. Furthermore, noxious weeds are not included in the field data and are being assessed based on "existing literature", which is not adequate for this assessment.Please provide a summary of existing plant community and plant species data (i.e.,plant distribution by species and quality) for KNC to assess whether current data covers the extent of the impacted area or whether additional field work is required.	The project is not expected to have any effects outside of the Draw Down Zone (DDZ), so reliance on data from the intensive, multi-year wildlife and vegetation monitoring programs currently ongoing in the Draw Down Zone (DDZ) is appropriate. With the implementation of the WUP studies there have been numerous field programs associated with CLBMON 11B4, CLBMON 12 and CLBMON 33 that produced comprehensive plant lists - recording all species observed. More than 150 species have been identified to date. A list of species is provided in Section 4.4		
225	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Assessment Methodology	Section 4.3.5 Residual effects and their significance - As noted above, define what is meant by "the sustainability of a VC Sub-component within the LSA." - Criteria for significance of residual effects clearly differ depending on the current conservation status and acknowledged thresholds for a VC. This same comment applies to all other VC categories in the assessment, hence this proposed definition of significance is not acceptable to the Ktunaxa	Definitions of significance have been provided in every VC Section. See response 222.		Definitions of significance have been provided in every VC Section.

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226	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Assessment Methodology	Section 4.3.6 Cumulative effects and Their Significance - As noted above, clarify in dAIR whether cumulative effects will be assessed for all VCs that show a residual effect (whether deemed significant or not). All VCs with residual effects should be brought forward into the cumulative effects analysis. - Not only regional targets or thresholds are relevant to determine significance, but also provincial and federal criteria such as the conservation status criteria used to rank species of conservation concern. - It states that "a cumulative environmental effect would be considered significant if the effect could result in a decline in a VC Sub-Component to lower than existing current levels, where the population is predicted to be unstable and/ or unsustainable within the RSA during construction or during the life of the proposed Project." Please define "unsustainable" and "unstable". If a VC is already of federal or provincial conservation concern, it is by definition not stable and in decline because of recognized threats, hence any incremental decline would be significant	If the Project is expected to result In a residual effect on a VC, it will be considered for a cumulative effects assessment. The process for scoping the assessment is described further in the EAO's guideline for the selection of valued components and assessment of potential effects, Section 3.5.5 : http://www.eao.gov.bc.ca/pdf/U224EAO_Valued_Components_Guideline_2013_09_09.pdf Thresholds of significance for VCs are described in the dAIR, and consider information provided by First Nations through Consultation and information-sharing. The evaluation of the VC, indicators, and methods for review are based scientific literature and the findings of previous studies and monitoring programs, as well as the experience and expertise of qualified professionals. Sustainability in the context of significance is explained as appropriate for the relevant VCs, cultural VCs are presented in Part C:		If the Project is expected to result In a residual effect on a VC, it will be considered for a cumulative effects assessment. The process for scoping the assessment is described further in the EAO's guideline for the selection of valued components and assessment of potential effects, Section 3.5.5 : http://www.eao.gov.bc.ca/pdf/U224EAO_Valued_Components_Guideline_2013_09_09.pdf Thresholds of significance for VCs are described in the dAIR, and consider information provided by First Nations through Consultation and information-sharing. The evaluation of the VC, indicators, and methods for review are based scientific literature and the findings of previous studies and monitoring programs, as well as the experience and expertise of qualified professionals. Sustainability in the context of significance is explained
227	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Assessment Methodology	Section 4.4 Plants - See notes already made about spatial extent of impacts; 500 m may not be sufficient.Propose amending to include areas outside of 500 m buffer that may be impacted by drying or changing water levels.	No impacts are expected outside of the current Draw Down Zone (DDZ)		
228	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Assessment Methodology	Sections 4.4, 4.5, 4.6, 4.7 Comments from Section 4.3 re: spatial extent of impacts, defining sustainability of VCs, and determining whether VCs will be considered in cumulative effects assessment apply to all subsequent sections. Section 4.4.2 - It states that "known occurrences and range extents of rare and sensitive species will be identified and mapped based on information from existing reports for all study areas and project-specific surveys completed at the capacitor site." This is not adequate; sitespecific surveys of rare plants are needed within the entire 500 m boundary for the construction/ operation LSA. Previous studies were confined to the DDZ, which covers off only a portion of the agreed upon LSA.	Acknowledged re Sections 4.4. - 4.7 ; regarding rare and sensitive species outside the Draw Down Zone (DDZ) . No impacts are expected outside of the current Draw Down Zone (DDZ)		
229	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Assessment Methodology	Herptiles Section 4.5.2 - The proposed definition/criteria for significance of residual and cumulative effects arenot acceptable for listed species for reasons previously stated. - In addition to reliance on past existing reports, site-specific surveys are required to characterise the existingconditions for all herptiles (not just painted turtles) in RR, since all previous surveys were confined to MCR. Also, a broader suite of existing reports must be considered, including reports produced by the FWCP, HCTF, and consultants.RR is known to support listed Coeur d'Alene Salamander, and surveys are needed to determine the abundance and distribution of this species, as well as western toad, etc.in the LSA. Section 4.5.5 - The proposed definition/criteria for significance of residual and cumulative effects are not acceptable for listed species for reasons previously stated	Coeur d'Alene Salamander is discussed in Section 4.5 and is noted to occur outside the Draw Down Zone (DDZ). The project is not expected to have any effects outside of the Draw Down Zone (DDZ), so reliance on data from the intensive, multi-year wildlife and vegetation monitoring programs currently ongoing in the Draw Down Zone (DDZ) is appropriate. Significance criteria will be defined as appropriate for each VC where residual effects are identified, and will consider all input received from First Nations, Core Committee, and Stakeholders related to the selection of significance criteria.		Coeur d'Alene Salamander is discussed in Section 4.5 of the EA and is noted to occur outside the Draw Down Zone (DDZ). The project is not expected to have any effects outside of the Draw Down Zone (DDZ), so reliance on data from the intensive, multi-year wildlife and vegetation monitoring programs currently ongoing in the Draw Down Zone (DDZ) is appropriate. Significance criteria will be defined as appropriate for each VC where residual effects are identified, and will consider all input received from First Nations, Core Committee, and Stakeholders related to the selection of significance criteria.
230	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Assessment Methodology	Birds Section 4.6.2 - In addition to reliance on past existing reports, project-specific surveys are required to characterise the existing status and conditions for all birds, since all previous surveys were confined to the DDZ. - In the case of the capacitor station, site-specific surveys must cover off the entire 500 m, and be of sufficient intensity and appropriate timing to uncover rare species if they are, according to RICs. Section 4.6.5 - The proposed definition/criteria for significance of residual and cumulative effects are not acceptable for listed species for reasons previously stated.	The bird surveys completed for the WUP included considerable effort within the Local Study Area (LSA) and data collected are sufficient to inform the EA. The project is not expected to have any effects outside of the Draw Down Zone (DDZ), so reliance on data from the intensive, multi-year wildlife and vegetation monitoring programs currently ongoing in the Draw Down Zone (DDZ) is appropriate. Most of the area within the 500 m buffer at the capacitor station is on private land and surveyors remained on the BC Hydro owned property. The site specific data supplemented with other existing information related to this eco-system is sufficient to understand the potential effects of the Project. Furthermore, conditions within Buffer can be reasonably inferred from the site data and observations collected from the surveys.		

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231	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Assessment Methodology	Mammals Section 4.7.1.1 - Spatial boundaries are not adequate, given the project description and up to 20 cm incremental decreases in winter water levels projected during low flow periods, which would affect the RR and places like Downie Reach, which freeze up in winter and are known to have wildlife crossing and potentially getting trapped, injured or killed due to winter ice formation. This pathway needs to be assessed in the appropriate spatial boundary, and must include the range of species potentially impacted, such as ungulates, furbearers, rodents, (e.g., beaver/muskrat), etc. Section 4.7.2 - In addition to reliance on past existing reports, project-specific surveys are required to characterise the existing status and conditions for all mammals, since previous surveys were confined to the DDZ. - In the case of the capacitor station, site-specific surveys must cover off the entire 500 m, and be of sufficient intensity and appropriate timing to uncover rare species if they are, according to RICs	In the REV 5 EA potential effects within the Revelstoke Reservoir were considered but were found to be negligible or none.There will be no change to normal operating range, and daily fluctuations would be similar for REV5 and REV 6. However, on rare occasions during winter, the increase in daily fluctuations could be up to 0.2m. These rare fluctuations will not effect wildlife. The project is not expected to have any effects outside of the Draw Down Zone (DDZ), so reliance on data from the intensive, multi-year wildlife and vegetation monitoring programs currently ongoing in the Draw Down Zone (DDZ) is appropriate. Most of the area within the 500 m buffer at the capacitor station is on private land and surveyors remained on the BC Hydro owned property. The site specific data supplemented with other existing information related to this eco-system is sufficient to		
232	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Economy	Under Economic Background, please require a table of predictions made and mitigations undertaken for the Rev 5 Project for Economic related VCs, and provide, for each, all available evidence of how Rev 5 has actually performed on that parameter with specific reference to equity of economic benefit or impact across regional communities.	Information regarding employment at Rev 5, including the predictions made in the EAC Application and the number of local and First Nation hires is included in Section 5.2, Economy.		Information regarding employment at Rev 5, including the predictions made in the EAC Application and the number of local and First Nation hires is included in the EA, Section 5.2, Economy.
233	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Economy	Require provision of employment statistics at the regional and local First Nation level. See previous AIR comments.	Information regarding employment levels at the local, regional, and First Nation level are included in Section 5.2, Economy.		
234	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Economy	"Information pertaining to lessons learned/issues identified during Rev 5 Project. " Please require proponent to specifically include success rates for local First Nations hires and Aboriginal hires as well as length of employment and types of employment. Evaluation of success of mitigations used in Rev 5 should be required. Include a description of barriers to meaningful First Nations employment with BC Hydro. See previous AIR comments.	Information on the number of First Nation hires on the Rev 5 Project are included in Section 5.2, Economy. Information describing the length of employment for these employees is not available. Mitigation measures to enhance First Nation opportunities at the Rev6 project in light of the experience at Rev 5 are included in the assessment.		Information on the number of First Nation hires on the Rev 5 Project are included in the EA, Section 5.2, Economy. Information describing the length of employment for these employees is not available. Mitigation measures to enhance First Nation opportunities at the Rev6 project in light of the experience at Rev 5 are included in the assessment.
235	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Socio-Community	Require a clear reference to Section C where indigenous socio-community considerations are dealt with – including effects on language, indigenous work force, indigenous businesses, traditional economy, and other issues.	Information from Part C will be integrated and cross-referenced throughout the Part B Economy and Socio-community Sections following receipt of Part C.		
236	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Socio-Community	Please require consideration of altered aesthetics and visual quality for the reservoir area to account for sensory change / disturbance, and altered sense of place as a result of water level changes and change to shoreline vegetation / erosion as a result of the Project.	As the 6th Unit will not result in an altered aesthetic and visual quality from the base case, it is not considered in the Visual Quality Assessment.		
237	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Socio-Community	Under Existing Conditions, please require a table of predictions made and mitigations undertaken for the Rev 5 Project for Socio-Community related VCs, and provide, for each, all available evidence of how Rev 5 has actually performed on that parameter with specific reference to equity of benefit or impact across regional communities.	BC Hydro has compared predicted with real effects of the addition of REV5 and this information has been incorporated in the baseline. A summary table will be provided.		Information considered for Socio Community existing conditions is outlined in Section 6.2 of the dAIR. Experience from REV5 has been incorporated in the baseline.
238	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Land and Resource Use	Please include the Kootenay-Boundary Land Use Plan and the Forest and Range Practices Act as two explicit bullets that will be included as sources of information.	Section 6.3, Land and Resource Use includes the Kootenay-Boundary Land Use Plan and Forest and Range Practices as sources of information.		
239	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Land and Resource Use	Please require the proponent to request and allow adequate time and resources for provision of formal or informal Indigenous land and water planning objectives for the Middle Columbia River that should be considered, and consider alignment of the Project with these, OR indicate where these are addressed in Section C of the application.	BC Hydro welcomes information related to Indigenous land and water planning objectives and will incorporate this information in the Application where appropriate. Section 6.2 Socio-community Assessment and Section 6.3 Land and Resource Use will consider potential First Nations land use plans overlapping the study areas as sources of information. Effects on First Nations related to land use will be addressed in Part C of the Application.		

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240	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Heritage Resources	Please provide rationale for why Shelter Bay was chosen for the downstream extent of LSA. Is this consistent with the extent of fluvial and erosion effects of the Project? Temporal Boundaries: Archaeological resources are non-renewable and if there is an impact then the temporal boundary is in perpetuity; not only for the length of the construction or operation of the project. Residual Effect and their Significance: The dAIR states that "the significance rating after mitigation of residual effects would be expected to be low as the mitigation strategies should have reduced the adverse effects to a level accepted by the Archaeology Branch". It is premature to already assume that an appropriate mitigation strategy can be reached in the AIR. The AIR should document how significance would be determined, and should not go so far as to say that it is expected to be low because of mitigation. We have no idea if what is possible until the effects assessment is concluded. It seems like the conclusions have already been reached based on this wording	-The Shelter Bay location was chosen early on in the Identification Phase of the Project as this was the general area similar to the Project area for Rev5. Refinement of the spatial extent of the Project often happens after the initial assessment begins because more information can shed light on effects. -The comment regarding the temporal boundary has been acknowledged and will be updated to reflect that impacts to heritage sites are irreversible and therefore would be in perpetuity. -The comment regarding the significance rating after mitigation being low is acknowledged and will be revised. -The comment regarding determination of significant adverse impacts and appropriate mitigation being decided by the Archaeology Branch is acknowledged and will be revised.		-The Shelter Bay location was chosen as it is the extent of hydrological influences of the Revelstoke Project. -The temporal boundaries for archaeology presented in Table 2 of Section 3.1 of the dAIR reflects the life of the project. Section 7.2 of the dAIR has been updated to reflect the non-renewable nature of historical and archaeological resources. -The comment regarding the significance rating after mitigation being low is acknowledged and has been removed from Section .7.2.7 of the dAIR. -determination of significant adverse impacts and appropriate mitigation has been modified in Sectin 7.2.7 of the dAIR to include consultation with First Nations.
241	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Health	This section is entirely inadequate. Consistent with past comments, there are well establish potential pathways of effect on human health from reservoir operations including methylmercury and public safety (e.g, alteration of ice formation, rapid water level changes). Proponent must be required to consider health effects in the reservoir areas,including Project effects on Traditional foods consumption, contaminants in wild foods, and impacts on safety of reservoir shore use	Section on Human Health. This will include methylmercury, EMF. Public safety is included in accidents and malfunctions sections.		The dAIR has been modified. Section 8, Human Health includes methylmercury and EMF. Public safety is included in the accidents and malfunctions sections.
242	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Effects of the Environment on the project	In addition to the individual natural hazards, the application should identify any potential for synergistic effects between events (extreme weather, natural seismic and associated events, fire and effects of climate change) and potential residual impacts to any of the VCs addressed in aforementioned sections.	The effects of each of these effects (weather, seismic, etc) have been addressed it is unclear how synergistic effects of these typically rare events might be assessed (e.g. seismic event during as forest fire)		The requirements for the consideration of Effects of the Environment on the Project are in Section 10 of the dAIR. Synergistic effects of rare events are not included due to their extremely low probability.
243	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Part C - Aboriginal Consultation	As noted above, proponent should be required to recognize that 'Aboriginal Interests' will be considered VCs and assessed as such in Part C. VCs from Part B and VCs from Part C (i.e.Aboriginal Interests) will be given equal importance and recognition.	The scope of Part C will be driven by the First Nations authors and it is expected will reflect First Nations interests.		The scope of Part C will be driven by the First Nations authors and it is expected it will reflect First Nations interests.
244	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Part E - Management Plans and Follow-up Programs	Please broaden the "Wildlife Management Plan" to encompass the broader management context of ecosystems, habitats, wildlife and biodiversity. A more appropriate title would be "Biodiversity Management Plan" to indicate that all levels of biodiversity (from ecosystems to habitats to species and SAR) are being managed under this umbrella document. Please include an operational 'cultural management plan' or alternately a 'Ktunaxa Values Management Plan'	BC Hydro will prepare Management Plans for construction activities which will consider ecosystems and First Nations' values.		
245	2016, April 28	Nicole Kapell	Ktunaxa Nation Council	Monitoring and Follow-Up Programs	Require consideration of the role of indigenous communities in monitoring and compliance	The role of indigenous communities in monitoring and compliance will be discussed with potentially impacted First Nations during the development of mitigation and monitoring measures.		
246	2016, April 27	Robert Hutton	Secwepemc	- Kokanee - Bull Trout	BC Hydro should: - Consider the potential effect of changes in water level on spawning access for BT and KO in tributaries to the Revelstoke Reservoir, including the magnitude, duration, and frequency of drawdown during migration/spawning periods. - Include the results of the KO entrainment studies as part of this assessment, including the effects of reduced food sources for BT (i.e. juvenile KO). Rational: - BC Hydro's assessment of changes in water levels focuses on the Revelstoke Dam Forebay. These results do not reflect site specific conditions experienced in (near) spawning tributaries. Further water level changes could have significant effects on fish if tributary access is already impeded. Only 7 of 30 tagged fish were observed in spawning tributaries in a previous study (i.e. 2003; pre-Rev 5). - Entrainment of KO is directly relevant to the assessment of impacts on KO and BT populations	Water level fluctuations in Revelstoke Reservoir are considered in the assessment as well as entrainment of kokanee. The study area encompasses the whole of Revelstoke Reservoir, not just the forebay. Detection of tagged fish in the tributaries in the 2003 study was not related to water levels or any kind of access issue.		Fish and Aquatic ecosystem effects including kokanee and burbot spawning are considered in Section 4.2 of the EA as outlined in Table 1 in the Appendix A of the dAIR. Water level fluctuations in Revelstoke Reservoir are considered in the assessment as well as entrainment of kokanee. The study area encompasses the whole of Revelstoke Reservoir, not just the forebay. Detection of tagged fish in the tributaries in the 2003 study was not related to water levels or any kind of access issue.
247	2016, April 27	Robert Hutton	Secwepemc	- Whitefish - Rainbow Trout - White Sturgeon - Bull Trout - Burbot	BC Hydro should: - Consider the effects of erosion and sedimentation on habitat degradation. Current studies on erosion and sedimentation resulting from BC Hydro operations should be expanded as they are currently limited in scope (i.e. number and location of sites). Rational: - Increased erosion and sedimentation can result in fish habitat degradation, particularly with respect to spawning habitats. Anecdotal evidence suggests there are several highly eroding sites that are not currently included in BC Hydro monitoring programs.	Erosion is addressed in a separate section of the EA. Bank erosion is not considered a significant impact to fish habitat in the MCR.		Erosion is outlined in Section 4.1 of the dAIR. Potential effects of erosion on fish and fish habitat are provided in Section 4.2. Bank erosion is not considered a significant impact to fish habitat in the MCR.

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NO	DATE	COMMENTS ORIGINATED		Topic Subject	Comments	RESPONSE	If unsatisfactory - Comments	Responses
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248	2016, April 27	Robert Hutton	Secwepemc	- Rainbow Trout - Brook Trout	BC Hydro should: - Conduct site-specific fisheries assessments to determine presence/absence. Rational: - Site specific assessments in reaches immediately adjacent to the project have not been conducted and there is some uncertainty in whether or not these reaches contain fish.	There is extensive database of fisheries information in reaches adjacent to the Revelstoke Dam and species composition is well known. Please refer to WUP studies CLBMON-16, CLBMON-17 in particular.		BC Hydro has conducted, and continues to conduct, numerous studies in the Mid Columbia Reach both upstream and downstream of the Revelstoke Dam. For example, studies in the Project Area for the Revelstoke Flow Management Plan of the Columbia Water Use Plan (WUP), completed and underway, include: •CLBMON-15A Middle Columbia River Physical Habitat Monitoring •CLBMON-15B Middle Columbia River Ecological Productivity Monitoring •CLBMON-16 Middle Columbia River Fish Population Indexing Surveys •CLBMON-17 Middle Columbia River Juvenile Fish Habitat Use •CLBMON-18 Middle Columbia River Adult Fish Habitat Use •CLBMON-53 Middle Columbia Juvenile Fish Stranding Assessment Specific studies considered in the Existing Conditions for fish and fish
249	2016, April 27	Robert Hutton	Secwepemc	Traditional Use and Knowledge	See general comments for VC Candidates	Concerns noted		
250	2016, April 27	Robert Hutton	Secwepemc	- Ecosystem Health and Function - Biodiversity	See general comments for VC Candidates	Concerns noted		
251	2016, April 27	Robert Hutton	Secwepemc	Federally and Provincially listed plant species	No comments at this time	No Comment required		
252	2016, April 27	Robert Hutton	Secwepemc	Federally and Provincially listed plant species	No comments at this time	No Comment required		
253	2016, April 27	Robert Hutton	Secwepemc	Traditional Use and Knowledge	See general comments for VC Candidates	Concerns noted		
254	2016, April 27	Robert Hutton	Secwepemc	Biodiversity	See general comments for VC Candidates	Concerns noted		
255	2016, April 27	Robert Hutton	Secwepemc	- Provincially list ecosystems - Wetlands	No comments at this time	No Comment required		
256	2016, April 27	Robert Hutton	Secwepemc	- Provincially listed ecosystems - Designated ESAs	No comments at this time	No Comment required		
257	2016, April 27	Robert Hutton	Secwepemc	Traditional Use and Knowledge	See general comments for VC Candidates	Concerns noted		
258	2016, April 27	Robert Hutton	Secwepemc	Ecosystem Health and Function	See general comments for VC Candidates	Concerns noted		
259	2016, April 27	Robert Hutton	Secwepemc	- Federally and Provincially listed bird species - Migratory birds - Raptors	BC Hydro should: - Improve knowledge and studies on the effects of Rev 5 operations on bird abundance and diversity in order to determine the potential effects of Rev 6 operations. Rational: - There seems to be much uncertainty in the results, trends, and causes with respect to ongoing studies on bird abundance and diversity	The bird surveys completed for the WUP included considerable effort within the Local Study Area (LSA) and data collected are sufficient to inform the EA. WUP studies implemented since 2008 have explored a number of topics related to birds. These include CLBMON 36 - investigating the effects of reservoir operations on nesting birds; CLBMON 39 - investigating the effects of reservoir operations on neotropical songbird populations during migration; CLBMON 40 - investigating the effects of reservoir operations on waterbirds, including habitats; and CLBMON 11B2 - investigated the diversity of spring migrants and habitat use in relation revegetation and wildlife enhancement activities.		The outline for assessment of birds including abundance and diversity is included in Section 4.6 of the dAIR. The bird surveys completed for the WUP included considerable effort within the Local Study Area (LSA) and data collected are sufficient to inform the EA. WUP studies implemented since 2008 have explored a number of topics related to birds. These include CLBMON 36 - investigating the effects of reservoir operations on nesting birds; CLBMON 39 - investigating the effects of reservoir operations on neotropical songbird populations during migration; CLBMON 40 - investigating the effects of reservoir operations on waterbirds, including habitats; and CLBMON 11B2 - investigated the diversity of spring migrants and habitat use in relation revegetation and wildlife enhancement activities.
260	2016, April 27	Robert Hutton	Secwepemc	- Federally and Provincially listed bird species - Migratory birds - Raptors	No comments at this time	No Comment required		
261	2016, April 27	Robert Hutton	Secwepemc	Traditional Use and Knowledge	See general comments for VC Candidates	Concerns noted		
262	2016, April 27	Robert Hutton	Secwepemc	Biodiversity	See general comments for VC Candidates	Concerns noted		

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263	2016, April 27	Robert Hutton	Secwepemc	- Federally and Provincially listed amphibian species - Federally and Provincially listed reptile species	BC Hydro should: - Improve ongoing studies the effects of changes in water levels and reservoir operations on amphibians, particularly with respect to determinations of the biological significance of these changes. Rational: - The biological significance of changes in water level and reservoir operations on amphibian abundance, mortality, and site occupancy is currently unknown. Such a circumstance makes it difficult to determine the significance of further changes/impacts.	The effects of reservoir operations is one of the questions being investigated for CLBMON-37.		The requirements for the assessment of herptiles including federally and provincially listed amphibians is provided in Section 4.5 of the dAIR. CLBMON-37 is studying the life history and habitat use of herptile populations in both the Arrow Lakes and Kinbasket Reservoirs.
264	2016, April 27	Robert Hutton	Secwepemc	- Federally and Provincially listed amphibian species - Federally and Provincially listed reptile species	No comments at this time	No Comment required		
265	2016, April 27	Robert Hutton	Secwepemc	Traditional Use and Knowledge	See general comments for VC Candidates	Concerns noted		
266	2016, April 27	Robert Hutton	Secwepemc	Biodiversity	See general comments for VC Candidates	Concerns noted		
267	2016, April 27	Robert Hutton	Secwepemc	- Federally and Provincially listed mammals species - Ungulates	BC Hydro should: - Include a furbearer(s) to the list of sub-components under this VC. These species should be water level dependent and culturally important (e.g. beaver and/or muskrat) - Include Caribou to the list of sub-components Rational: - Furbearer(s) have not been considered or assessed	There are three subcomponents under the Mammals VC: Species at Risk, Ungulates, and Traditional Use and Knowledge. In the EA, caribou are included in both the Species at Risk and Ungulates discussions; however, they are discussed in more detail in the Species at Risk subsection (Southern Mountain Caribou) as it precedes the Ungulates discussion. Furbearers have been included in Section 4.7. In addition, furbearing species of cultural or economic importance to First Nations are discussed in Part C.		There are three subcomponents under the Mammals VC: Species at Risk, Ungulates, and Traditional Use and Knowledge. In the EA, caribou are included in both the Species at Risk and Ungulates discussions; however, they are discussed in more detail in the Species at Risk subsection (Southern Mountain Caribou) as it precedes the Ungulates discussion. Within the Mammals Section (Section 4.7) the sub-components include Mammal Species at Risk, Ungulates, and Traditional Use and Knowledge (species specifically identified by Aboriginal Groups that are of cultural or economic importance). Within the Traditional Use and Knowledge sub-component furbearers have been identified and a list of the species (17 in total) known or likely to occur within the Generation LSA is provided in Table 4.7-7 (found in the Description of
268	2016, April 27	Robert Hutton	Secwepemc	- Federally and Provincially listed mammals species - Ungulates	No comments at this time	No Comment required		
269	2016, April 27	Robert Hutton	Secwepemc	Traditional Use and Knowledge	See general comments for VC Candidates	Concerns noted		
270	2016, April 27	Robert Hutton	Secwepemc	Biodiversity	See general comments for VC Candidates	Concerns noted		
271	2016, April 27	Robert Hutton	Secwepemc	- Economy Revenues (Regional & Provincial) - Employment - Accommodation - Fishery	BC Hydro should: - Provide a summary of economic, training, and employment targets and results for First Nations via the Rev 5 and Mica 5/6 projects, including whether these targets were met (or not) and why. - Include a specific measure of revenues, contract procurement, employment, training, and capacity building for each First Nation associated with the Rev 6 project. - Conduct an assessment of the economic effects on First Nations due to the Rev 6 project.	Information regarding employment levels at the local, regional, and First Nation levels, including the number of First Nation hires on the Rev 5 Project, are provided in Section 5.2 of the EA. Measures to enhance First Nation opportunities at the Rev6 project in light of the experience at Rev 5 are also included in the EA. Where appropriate, information from Part C will be integrated and cross-referenced in the Part B Economy and Socio-community Sections following receipt of Part C.		Employment, training and economic issues related to REV 5 were considered as outlined in Section 5.2 of the dAIR. Information regarding employment levels at the local, regional, and First Nation levels, including the number of First Nation hires on the Rev 5 Project, are provided in Section 5.2 of the EA. Measures to enhance First Nation opportunities at the Rev6 project in light of the experience at Rev 5 are also included in the EA. Where appropriate, information from Part C will be integrated and cross-referenced in the Part B Economy and Socio-community Sections following receipt of Part C.
272	2016, April 27	Robert Hutton	Secwepemc	- Economy Revenues (Regional & Provincial) - Employment - Accommodation	BC Hydro should: - Provide a summary of economic, training, and employment targets and results for First Nations via the Rev 5 and Mica 5/6 projects, including whether these targets were met (or not) and why. - Include a specific measure of revenues, contract procurement, employment, training, and capacity building for each First Nation associated with the Rev 6 project. - Conduct an assessment of the economic effects on First Nations due to the Rev 6 project.	Information regarding employment levels at the local, regional, and First Nation levels, including the number of First Nation hires on the Rev 5 Project, are provided in Section 5.2 of the EA. Measures to enhance First Nation opportunities at the Rev6 project in light of the experience at Rev 5 are also included in the EA. Where appropriate, information from Part C will be integrated and cross-referenced in the Part B Economy and Socio-community Sections following receipt of Part C.		

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273	2016, April 27	Robert Hutton	Secwepemc	- Population and Demographics - Community services and infrastructure - Traffic	See general comments for VC Candidates			
274	2016, April 27	Robert Hutton	Secwepemc	- Population and Demographics - Community services and infrastructure - Traffic	See general comments for VC Candidates			
275	2016, April 27	Robert Hutton	Secwepemc	- Recreation - Tourism - Resource Use	See general comments for VC Candidates			
276	2016, April 27	Robert Hutton	Secwepemc	- Recreation - Tourism - Resource Use	See general comments for VC Candidates			
277	2016, April 27	Robert Hutton	Secwepemc	- Recreation - Tourism - Resource Use	See general comments for VC Candidates			
278	2016, April 27	Robert Hutton	Secwepemc	- Locations with protected archaeological or historical sites, features, and artifacts	BC Hydro should: - Separate Cultural Heritage and Archeology as stand-alone VCs (See general comments for VC candidates) - Improve current Reservoir Archeology Programs (RAP) to provide more comprehensive and representative information on archeological sites, landforms and landscapes and the resulting impacts due to BC Hydro operations. Specific measures and targets for erosion and water level fluctuations should be developed and linked to the ongoing impacts on archeological sites. These studies should include indigenous knowledge and assessment of the effects from an aboriginal perspective. Consideration should be given to turning over the management of the RAP to the Columbia Basin First Nations and linking to objective under First Nations Governance below.	Agree. 'First Nations Cultural Heritage' will be assessed by First Nations in Part C of the Application. 'Historical and Archaeological Heritage' will be assessed in Part B. Comments specific to the RAP will be provided to the BC Hydro RAP coordinator to share with the Columbia Technical Working Group for consideration.		Agree. 'First Nations Cultural Heritage' will be assessed by First Nations in Part C of the Application. 'Historical and Archaeological Heritage' will be assessed in Part B as outlined in Section 7.2 of the dAIR. Comments specific to the RAP will be provided to the BC Hydro RAP coordinator to share with the Columbia Technical Working Group for consideration.
279	2016, April 27	Robert Hutton	Secwepemc	- Locations with protected archaeological or historical sites, features, and artifacts	BC Hydro should: - Separate Cultural Heritage and Archeology as stand-alone VCs (See general comments for VC candidates) - Improve current Reservoir Archeology Programs (RAP) to provide more comprehensive and representative information on archeological sites, landforms and landscapes and the resulting impacts due to BC Hydro operations. Specific measures and targets for erosion and water level fluctuations should be developed and linked to the ongoing impacts on archeological sites. These studies should include indigenous knowledge and assessment of the effects from an aboriginal perspective. Consideration should be given to turning over the management of the RAP to the Columbia Basin First Nations and linking to objective under First Nations Governance below.	Agree. 'First Nations Cultural Heritage' will be assessed by First Nations in Part C of the Application. 'Historical and Archaeological Heritage' will be assessed in Part B. Comments specific to the RAP will be provided to the BC Hydro RAP coordinator to share with the Columbia Technical Working Group for consideration.		Agree. 'First Nations Cultural Heritage' will be assessed by First Nations in Part C of the Application. 'Historical and Archaeological Heritage' will be assessed in Part B as outlined in Section 7.2 of the dAIR. Comments specific to the RAP will be provided to the BC Hydro RAP coordinator to share with the Columbia Technical Working Group for consideration.
280	2016, April 27	Robert Hutton	Secwepemc	- Locations with protected archaeological or historical sites, features, and artifacts	BC Hydro should: - Separate Cultural Heritage and Archeology as stand-alone VCs (See general comments for VC candidates) - Improve current Reservoir Archeology Programs (RAP) to provide more comprehensive and representative information on archeological sites, landforms and landscapes and the resulting impacts due to BC Hydro operations. Specific measures and targets for erosion and water level fluctuations should be developed and linked to the ongoing impacts on archeological sites. These studies should include indigenous knowledge and assessment of the effects from an aboriginal perspective. Consideration should be given to turning over the management of the RAP to the Columbia Basin First Nations and linking to objective under First Nations Governance below.	Agree. 'First Nations Cultural Heritage' will be assessed by First Nations in Part C of the Application. 'Historical and Archaeological Heritage' will be assessed in Part B. Comments specific to the RAP will be provided to the BC Hydro RAP coordinator to share with the Columbia Technical Working Group for consideration.		

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281	2016, April 27	Robert Hutton	Secwepemc	- Locations with protected archaeological or historical sites, features, and artifacts	BC Hydro should: - Separate Cultural Heritage and Archeology as stand-alone VCs (See general comments for VC candidates) - Improve current Reservoir Archeology Programs (RAP) to provide more comprehensive and representative information on archeological sites, landforms and landscapes and the resulting impacts due to BC Hydro operations. Specific measures and targets for erosion and water level fluctuations should be developed and linked to the ongoing impacts on archeological sites. These studies should include indigenous knowledge and assessment of the effects from an aboriginal perspective. Consideration should be given to turning over the management of the RAP to the Columbia Basin First Nations and linking to objective under First Nations Governance below.	Agree. 'First Nations Cultural Heritage' will be assessed by First Nations in Part C of the Application. 'Historical and Archaeological Heritage' will be assessed in Part B. Comments specific to the RAP will be provided to the BC Hydro RAP coordinator to share with the Columbia Technical Working Group for consideration.		
282	2016, April 27	Robert Hutton	Secwepemc	- Noise - Air Quality - Visual	No comments at this time	No Comment required		
283	2016, April 27	Robert Hutton	Secwepemc	- Noise - Air Quality - Visual	No comments at this time	No Comment required		
284	2016, April 27	Robert Hutton	Secwepemc	TBD	BC Hydro should: - Engage First Nations in a meaningful discussion on co-management of cultural and natural resources in the Upper Columbia River. Development of relationships and trust between BC Hydro and First Nations can only be achieved through meaningful consideration and incorporation of our values and goals with respect to cultural and natural resource management.	BC Hydro will continue to engage First Nations in meaningful discussions in the management of cultural and natural resources in the Upper Columbia. The issues raised are beyond the scope of the EA for the Project.		
285	2016, April 27	Robert Hutton	Secwepemc	- Federally and Provincially listed species and ecosystems - Other species and ecosystems of interest to First Nations	BC Hydro should: - Conduct rigorous project-specific field programs to accurately describe the existing environment with respect to plants and ecological communities. - Ecosystems and species of special concern and supporting habitats within and adjacent to the proposed area of influence (see general comments) should be documented. Species and communities of special concern includes those species of interest to First Nations as well as provincially and federally-listed species of concern. - Conduct field programs to be consistent with accepted biological inventory standards and practices. - Both direct and indirect effects on all VCs should be considered. Rationale: - Proponent has committed to describing existing environment without conducting project-specific field work to verify characterization of the exiting environment. Accurate field data is essential in conducting a legitimate effects assessment.	The surveys completed for the WUP and other programs included considerable effort within the Local Study Area (LSA) and data collected are sufficient to inform the EA. Results of multi-year monitoring programs are necessary to assess wildlife and vegetation responses to reservoir operation. Time-series data are needed, especially as the operating regime is not constant but varies from year to year depending on numerous factors. Data from the WUP monitoring programs are suitable and relevant to the REV6 assessment as they provide detail on the proposed Indicators of many Sub-components - including provincially and federally-listed species of concern (and supporting habitats)		
286	2016, April 27	Robert Hutton	Secwepemc	- Traditional Use and Knowledge - Biodiversity	Comments above	Concerns noted		
287	2016, April 27	Robert Hutton	Secwepemc	- Federally and Provincially listed bird species - Migratory birds - Raptors - Species of special interest to First Nations	BC Hydro should: - Improve knowledge and studies on the effects of Rev 5 operations on bird abundance and diversity in order to determine the potential effects of Rev 6 operations. - Expand field programs to adequately describe existing conditions, habitat suitability and potential species effects as a result of the Rev 6 project – all aspects. - Conduct field programs to adequately describe current and potential use and identify species of concern, which includes species important to FN - Determine LSA based on habitat requirements of species present. Rational: - There seems to be much uncertainty in the results, trends, and causes with respect to ongoing studies on bird abundance and diversity - Drawn down zones and tributary inlets on Revelstoke Reservoir likely provide critical habitat to bird species and should be included in the LSA.	The surveys completed for the WUP and other programs included considerable effort within the Local Study Area (LSA) and data collected are sufficient to inform the EA. WUP studies implemented since 2008 have explored a number of topics related to birds. These include CLBMON 36 - investigating the effects of reservoir operations on nesting birds; CLBMON 39 - investigating the effects of reservoir operations on neotropical songbird populations during migration; CLBMON 40 - investigating the effects of reservoir operations on waterbirds, including habitats; and CLBMON 11B2 - investigated the diversity of spring migrants and habitat use in relation revegetation and wildlife enhancement activities. Studies to date have focused on the Draw Down Zone (DDZ) of the Arrow Lakes Reservoir as the habitats found there are considered to be of greater use and importance to the habitat		
288	2016, April 27	Robert Hutton	Secwepemc	- Traditional Use and Knowledge - Biodiversity	Comments above	Concerns noted		

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289	2016, April 27	Robert Hutton	Secwepemc	- Federally and Provincially listed herptile species - Species of special interest to First Nations	BC Hydro should: - Improve ongoing studies the effects of changes in water levels and reservoir operations on amphibians, particularly with respect to determinations of the biological significance of these changes. - Conduct biological inventory at capacitor station site to include herptile species. Rational: - The biological significance of changes in water level and reservoir operations on amphibian abundance, mortality, and site occupancy is currently unknown. Such a circumstance makes it difficult to determine the significance of further changes/impacts. - Changes in water level fluctuations, duration, extent, timing, etc will potentially effect ecological communities (habitat) abundance and position within the LSA. A shift in ecological communities and functionality poses a potential threat to local populations.	The effects of reservoir operations on amphibians is one of the questions being investigated for CLBMON-37. There are numerous management objectives that are part of the 10 year study including how reservoir operations affect herptile populations by monitoring abundance, diversity, distribution, productivity, and patterns of habitat use over time. The assessment of the effects at the capacitor station are based on the amount of area potentially affected and the suitability of the habitat to herptile species that occurs on the site. Breeding habitat for amphibians will not be affected by the construction of the capacitor station as none occurs on the BC Hydro property. Suitability for most reptile species is considered to be low to very low. This is due to the absence of habitat characteristics that define habitat quality for many species (e.g., talus, rock piles, large coarse woody debris, warm aspects)		The effects of reservoir operations on amphibians is one of the questions being investigated for the 10 year CLBMON-37 study being completed under the Columbia Water Use Plan (WUP). CLBMON-37 has a number of management objectives that include how reservoir operations affect herptile populations by monitoring abundance, diversity, distribution, productivity, and patterns of habitat use over time. The assessment of the effects at the capacitor station are based on the amount of area potentially affected and the suitability of the habitat to herptile species that occurs on the site. Breeding habitat for amphibians will not be affected by the construction of the capacitor station as none occurs on the BC Hydro property. Suitability for most reptile species is considered to be low to very low. This is due to the
290	2016, April 27	Robert Hutton	Secwepemc	- Traditional Use and Knowledge - Biodiversity	See general comments for VC Candidates	Concerns noted		
291	2016, April 27	Robert Hutton	Secwepemc	- Federally and Provincially listed mammal species - Ungulates - Fur-bearers - Species of special interest to First Nations	BC Hydro should: - Field programs should include wildlife and wildlife habitat inventories that would be used in assessing potential project-specific effects on species from various taxa. Inventories should include species of special concern to First Nations. Rational: - Relying on previously collected data not focused on project-specific outcomes, or multi-year programs not yet completed (such as Rev 5 monitoring works) is not deemed adequate. - Scope of assessments providing baseline information should reflect the project being assessed. - Potential for broad scale information gaps particularly with respect to biodiversity and species of special interest to First Nations.	The surveys completed for the WUP and other programs included considerable effort within the Local Study Area (LSA) and data collected are sufficient to inform the EA. Results of multi-year monitoring programs are necessary to assess wildlife and vegetation responses to reservoir operation. Time-series data are needed, especially as the operating regime is not constant but varies from year to year depending on numerous factors. Data from the WUP monitoring programs are suitable and relevant to the REV6 assessment as they provide detail on the proposed Indicators of many Sub-components Part C will provide biodiversity and species of interest to FN information		
292	2016, April 27	Robert Hutton	Secwepemc	- Traditional Use and Knowledge - Biodiversity	See general comments for VC Candidates	Concerns noted		
293	2016, April 27	Robert Hutton	Secwepemc	General dAIR Comments	- Where the proponent relies existing, or historical, reports or information to describe the existing environment from which an effects assessment is based, a review of existing information and gap analysis with respect to the proposed Rev6 project should be conducted and documented in the application submission. The scope of previous studies may not be appropriate for use on the proposed Rev6 project without supplementary studies or field verification.	The existing data were reviewed and field studies as well as modelling were initiated to address to data gaps. These included 3 field studies at the capacitor station site, the installation of water level loggers at selected sites in the MCR and the development of a new hydrological model. These studies were discussed with the FN , Core Committee and stakeholders. The existing data has been made available.		The use of existing reports and information were used to inform the assessment as outlined in Section 3.3 of the dAIR. The existing data were reviewed and field studies as well as modelling were initiated to address to data gaps. These included 3 field studies at the capacitor station site, the installation of water level loggers at selected sites in the MCR and the development of a new hydrological model. These studies were discussed with the FN , Core Committee and stakeholders. The existing data has been made available.
294	2016, April 27	Robert Hutton	Secwepemc	General dAIR Comments	- The proponent should provide a description of the expected footprint resulting from all aspects of the project from pre-construction to various forecasted operational scenarios. Operational scenarios would include information on projected changes to water levels, fluctuations, duration and timing of events. - The proponent should consider other factors (e.g BCH projects elsewhere in the province) potentially affecting the operations of the Revelstoke Dam and associated reservoir(s) in the Columbia system.	information on operations will be provided in the EA and include system wide considerations		An outline of operations is provided in Section 4.1 of the dAIR and information on operations will be provided in the EA and include system wide considerations, changes to water levels, fluctualtions, duration and timing of events. Section 4.1 of the EA includes a description a map showing the maximum inundation and incremental flooding areas.
295	2016, April 27	Robert Hutton	Secwepemc	General dAIR Comments	The proponent should be conducting rigorous project-specific field programs to accurately describe the existing environment.	Rigorous field programs for many VCs are being conducted for the WUP studies - and these do describe the existing environment. Additional studies were added to understand the habitats and potential species occurrence where data was limited. The surveys completed for the WUP and other programs included considerable effort within the Local Study Area (LSA) and data collected are sufficient to inform the EA.		The use of field studies and other information to assess baseline conditions is outlined in Section 3.0 of the dAIR. Rigorous field programs for many VCs are being conducted for the WUP studies - and these do describe the existing environment. Additional studies were added to understand the habitats and potential species occurrence where data was limited. The surveys completed for the WUP and other programs included considerable effort within the Local Study Area (LSA) and data collected are sufficient to inform the EA.

REV6 Comments Tracking Table
All dAIR Comments Received Prior to End of August 2016

NO	DATE	COMMENTS ORIGINATED		Topic Subject	Comments	RESPONSE	If unsatisfactory - Comments	Responses
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296	2016, April 27	Robert Hutton	Secwepemc	General dAIR Comments	The Environmental Assessment should include comprehensive review of potential impacts to all areas as a result of Rev6 operation. For example, upstream reservoir(s) and dam operational effects. Both direct and indirect effects to VC's should be considered.	The environmental assessment is focussed on the interactions between the Project and the VCs, including direct and indirect effects and effects related to operations. There will be no change to normal Revelstoke Reservoir operating range, and daily fluctuations would be similar for REV5 and REV 6.		The spatial boundaries of the assessment are described in detail in Table 3 in Section 3.2 of the dAIR and include locations upstream and downstream of Revelstoke dam and the Transmission component near Trout Creek, west of Summerland. The environmental assessment is focussed on the interactions between the Project and the VCs, including direct and indirect effects and effects related to operations. There will be no change to normal Revelstoke Reservoir operating range, and daily fluctuations would be similar for REV5 and REV 6.
297	2016, April 27	Robert Hutton	Secwepemc	General dAIR Comments	The proponent should consider ecological critical thresholds in effects determinations.	Critical thresholds will be considered where information is available. Many WUP studies are attempting to measure how Reservoir operations affect many terrestrial species that occur within the draw down zone.		Thresholds are discussed for each VC in the dAIR. Critical thresholds will be considered where information is available. Many WUP studies are attempting to measure how Reservoir operations affect many terrestrial species that occur within the draw down zone.
298	2016, April 27	Robert Hutton	Secwepemc	General dAIR Comments	Provide linkages between VCs and assess effects accordingly. All VCs are not mutually exclusive. E.g. Ecological communities provide habitats for flora and fauna. Changes to hydrology impact ecological community function, and so flora and fauna are also to be considered.	Ecosystem Health and Function for Biodiversity is a specific Sub-component of the Ecologcial Communities VC. This does consider the linkages between habitats available within the study areas and the occurrence of both flora and fauna. The assessment looks at potential changes to these communities via changes in inundation and erosion		Linkages between VCs and assessed affects are mapped in Table 4 of Appendix A of the dAIR. Ecosystem Health and Function for Biodiversity is a specific Sub-component of the Ecologcial Communities VC. This does consider the linkages between habitats available within the study areas and the occurrence of both flora and fauna. The assessment looks at potential changes to these communities via changes in inundation and erosion
299	2016, April 27	Robert Hutton	Secwepemc	General dAIR Comments	The current process for selecting VCs and assessing cultural and environmental impacts is limiting and somewhat narrow in scope given the extent of existing impacts resulting from BC Hydro infrastructure and operations in the Upper Columbia River	The environmental assessment is focussed on the interactions between the Project and the VCs. An assessment of the broader effects of development in the Upper Columbia is beyond the scope of this assessment.		The environmental assessment is focussed on the interactions between the Project and the VCs. Cultural impacts will be discussed in Part C of the EA. An assessment of the broader effects of development in the Upper Columbia is beyond the scope of this assessment.
300	2016, April 27	Robert Hutton	Secwepemc	General dAIR Comments	A comprehensive cumulative effects assessment, including past, present, and reasonably foreseeable future development and impacts within a scientifically justifiable temporal and spatial scope, should be completed. This assessment should include both cultural and environmental impacts and should include all BC Hydro infrastructure and operations associated with Mica, Revelstoke, and Keenleyside Dams (i.e. access roads, transmission lines, capacitor stations and other associated infrastructure);	Cumulative effects assessment considers the effects of past, present, and reasonably foreseeable future development where there is an interaction with the residual effects of the Proposed project.		The scope of the cumulative affects assessment is outlined in Section 3.10 of the dAIR. Cumulative effects assessment considers the effects of past, present, and reasonably foreseeable future development where there is an interaction with the residual effects of the Proposed project.
301	2016, April 27	Robert Hutton	Secwepemc	General dAIR Comments	Identification of baseline conditions should include characterization of conditions at (at least) 3 points in time, including pre-dam, pre-Rev 5, and pre-Rev 6. Temporal trends should be developed (estimated) for each VC to better understand the extent of past change and context of Rev 6 impacts. This analysis is necessary to adequately determine the significance and risk of further impacts;	Existing conditions describe as applicable historical conditions and past change for many of the VCs, but in some cases is limited by the data available to describe historic conditions.		Temporal boundaries of the assessment are detailed in Table 3 of Section 3.2 of the dAIR. Existing conditions describe as applicable historical conditions and past change for many of the VCs, but in some cases is limited by the data available to describe historic conditions.
302	2016, April 27	Robert Hutton	Secwepemc	General dAIR Comments	Robust metrics need to be used, and in some cases developed, for each of the VCs in order to understand the extent of change and potential impacts. This should be based on scientific literature and will ensure transparency and unbiased determinations. Much emphasis is currently placed on professional judgment which, in our opinion, does not constitute scientific evidence of a significance impact or lack thereof.	The evaluation of the VC, indicators, and methods for review are based scientific literature and the findings of previous studies and monitoring programs, as well as the experience and expertise of qualified professionals.		
303	2016, April 27	Robert Hutton	Secwepemc	General dAIR Comments	Significance thresholds should be developed for each VC, with consideration of past changes, current conditions, and the risk of further change. Risk assessments will be an important prerequisite for the determination of significance thresholds. Aboriginal perspectives on significance thresholds and acceptable risks should be considered and incorporated	Significance criteria have been presented in the AIR and described in greater detail in the draft Application. Aboriginal perspectives on significance criteria will be considered if provided.		Agreed. The determination of significance is described in the AIR and described in greater detail in the draft Application. Aboriginal perspectives on significance criteria will be considered if provided.
304	2016, April 27	Robert Hutton	Secwepemc	General dAIR Comments	Determination of the reliability of information used in these assessments is paramount. We have repeatedly requested a comprehensive gap analysis of the information used in these assessments and determinations. Recognizing that BC Hydro has recently provided a comprehensive list of information and study results, there has not yet been any determination of the reliability of this information and/or critical gaps in this information.	The draft Application addresses the data sources used in the assessment and the suitability and quality of the information as a basis for conducting the assessment. Field work perfromed to address data gaps as been described.		The reliability of information used in the assessment is discussed in the Existing Conditions as set out in Section 3.3 of the dAIR. The draft Application addresses the data sources used in the assessment and the suitability and quality of the information as a basis for conducting the assessment. Field work performed to address data gaps as been described.

REV6 Comments Tracking Table
All dAIR Comments Received Prior to End of August 2016

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305	2016, April 27	Robert Hutton	Secwepemc	General dAIR Comments	Ecosystem Health and Function should be a VC, rather than just a sub-component of aquatic and terrestrial VCs. It is important to consider both top-down and bottom-up pathways, for example: o Ecosystem Health and Function as a VC considers all aquatic and terrestrial impacts on the ecosystem as a whole; and o Ecosystem Health and Function as a sub-component considers ecosystem impacts on aquatic and terrestrial resources.	Ecosystem health and function is a sub-component of Ecological Communities. The sub-component does consider the effects to the other VCs - including plants, herptiles, birds, and mammals.		Ecosystem Health and Function for Biodiversity is a specific sub-component of the Ecological Communities VC as set out in Section 4.3 of the dAIR and listed in Table 2 of Section 3.1 of the dAIR. The sub-component does consider the effects to the other VCs - including plants, herptiles, birds, and mammals.
306	2016, April 27	Robert Hutton	Secwepemc	General dAIR Comments	Biodiversity should also be a VC based on the same rational provided above.	Ecosystem Health and Function for Biodiversity is a specific sub-component of the Ecologcial Communities VC. This does consider the linkages between habitats available within the study areas and the occurrence of both flora and fauna		Ecosystem Health and Function for Biodiversity is a specific sub-component of the Ecological Communities VC as set out in Section 4.3 of the dAIR and listed in Table 2 of Section 3.1 of the dAIR. This does consider the linkages between habitats available within the study areas and the occurrence of both flora and fauna
307	2016, April 27	Robert Hutton	Secwepemc	General dAIR Comments	Cultural Heritage (i.e. Traditional Land and Resource Use) should be a stand-alone VC. Sub-components to this VC would include culturally important resources (e.g. water, fish, wildlife, plants…etc.), land use (e.g. hunting, fishing, gathering, transportation, recreation, cultural sites, village sites…etc.), and archeology. Cultural Heritage and Archeology should include landforms and landscapes not covered under the BC Cultural Heritage Act. Intangible cultural heritage values should also be included, such as place names and transmission of knowledge. Past, present and future cultural heritage impacts should be assessed. Socio-community and socio-economic effects should also be a key focus and sub-component of this assessment. This assessment should include compilation of indigenous knowledge related to land and resources uses and be solely based on aboriginal perspectives of the effects of BC Hydro infrastructure and operations. The use of information from previous studies as a baseline reference is not supported. We will provide a cultural heritage assessment for the Rev 6 project. Further discussions with	The Heritage and Archaeology candidate VC has been split into 'First Nations Cultural Heritage' and 'Historical and Archaeological Heritage'. 'First Nations Cultural Heritage' section will be assessed by First Nations in Part C of the Application. 'First Nations Cultural Heritage' could include the following: landforms; intangible heritage sites; traditional use & knowledge. Socio-community and socio-economic effects assessment may be included in Part C of the Application.		As set out in Table 2 of Section 3.1 of the dAIR, the Heritage and Archaeology candidate VC has been split into 'First Nations Cultural Heritage' and 'Historical and Archaeological Heritage'. 'First Nations Cultural Heritage' section will be assessed by First Nations in Part C of the Application. 'First Nations Cultural Heritage' could include the following: landforms; intangible heritage sites; traditional use & knowledge. Socio-community and socio-economic effects assessment may be included in Part C of the Application.
308	2016, April 27	Robert Hutton	Secwepemc	General dAIR Comments	Restoration of Salmon to the headwaters of the Columbia River system should be included in the fisheries components of the VC and EIA documents, including an assessment of the potential impacts on Salmon as well as identification of an approach to work with First Nations to restore fish passage at BC Hydro dams.	Revelstoke Unit 6 project activities and operations will not preclude the ongoing potential for future fish passage or fish resource use of concern to First Nations. The Canadian Columbia River Intertribal Fisheries Commission (CCRIFC) has proposed the formation of a multiagency committee to start investigating the feasibility of salmon restoration in the Columbia. BC Hydro has agreed to participate in such a committee should it proceed		This interest is acknowledged; however, anadromous salmon are not included in the scope of the EA. Revelstoke Unit 6 project activities and operations will not preclude the ongoing potential for future fish passage or fish resource use of concern to First Nations. BC Hydro has agreed to participate in the Canadian Columbia River Intertribal Fisheries Commission (CCRIFC) multiagency committee to start investigating the feasibility of salmon restoration in the Columbia should it proceed. A venue for discussing salmon and other broader issues will be through BCH/First Nations Relationships Agreements
309	2016, April 25	Nancy Bonneau	Westbank First Nation		Baseline Generating Station: "provincially Blue-listed moss grass (Coleanthus subtilis) discovered in 2014 in MCR". (2015 November 24) "Two species at risk known present: 1) Western toad (Anaxyrus boreas) provincially Blue-listed, SARA listed as Special Concern. Impacts from inundation of breeding sites notes. 2) Western painted turtle (Chrysemys picta) provincially Blue-listed, SARA-listed as Special Concern. These cannot be devalued and are of concern to Westbank First Nation.	The assessment considers the potential effects to western toad and painted turtle in the Herptile VC section (Section 4.5) and moss grass is discussed in Section 4.4 (Plants).		Western Toad, Painted Turtle, and Moss Grass are listed in the dAIR, Table 2 in Section 3.1.
310	2016, April 25	Nancy Bonneau	Westbank First Nation		"Baseline – Generating Station: overall (between 2008 and 2014), 161 nests (of 32 species) failed as a direct result of reservoir operations. Reservoir levels may influence stopover habitat quality." (2015 November 24) This is in reference to migratory birds and is a concern to Westbank First Nation. Very concerning to Westbank First Nation to lose so many nests and species.	Concerns Noted - Section 4.6 (Birds) reviews the additional effect a sixth unit may have on nesting birds		Concerns Noted - Section 4.6 (Birds) reviews the additional effect a sixth unit may have on nesting birds. Refer to Section 4.6 of the dAIR.
311	2016, April 25	Nancy Bonneau	Westbank First Nation		"Baseline – Generating Station: caribou currently located south and west of Revelstoke Dam adjacent to Westside Road. Critical caribou habitat identified on east side of Revelstoke Reach and around Revelstoke. Elk, moose, deer, grizzly bear documented using drawdown zone of Arrow Lakes Reservoir. Ungulate Winter Range for caribou and mule deer.	Noted. Consideration of these species are included in the baseline.		Consideration of these species are included in the baseline. Refer to Section 4.7 of the dAIR.
312	2016, April 25	Nancy Bonneau	Westbank First Nation		Located within moose Resource Management Zone designated by Okanagan – Shuswap LRMP. Ungulate Winter Range for moose and deer."	Noted - the Mammal VC Section discusses the UWR that overlaps the proposed site for the capacitor station		Noted - the Mammal VC Section discusses the UWR that overlaps the proposed site for the capacitor station. Ungulate Winter Range is considered in Table 2 Section 3.1 of the dAIR.

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313	2016, April 25	Nancy Bonneau	Westbank First Nation		What are the biological effects of the TDG? How much TDG is produced?	Information on Total Dissolved Gas is be provided in the EA.		Total Gas Pressure, a measure of TDG, is an indicator included in Table 2 of 3.1 of the dAIR. Information on Total Dissolved Gas is be provided in Section 4.2 Fish and Fish Habitat of the EA.
314	2016, April 25	Nancy Bonneau	Westbank First Nation		Primary Production: a definition is needed for Ecological Productivity. There hasn't been any discussion on effects of the possible construction of additional warehouse or expansion of existing warehouse, parking, contractors' offices, and laydown areas. The construction of any or all of these, plus additional buildings and roads not identified, may have an effect upon plants, herptiles, birds, mammals, such as displacement, ungulate winter range diffusion. Timing of construction, inundation of areas, could displace wildlife during breeding season or during calving season. Changes to wildlife habitat is a concern. Mortality crushing of birds eggs, herptiles and small mammals recording was limited to foot print. How many? What types of eggs?	"Ecological Productivity" is not included in the mammals assessment. A discussion of potential effects of construction at both the dam site and capacitor station is provided for each terrestrial VC chapter.		Sections 4.3 to 4.7
315	2016, April 25	Nancy Bonneau	Westbank First Nation	Salmon restoration	"What can REV6 do that would enhance and help Salmon Restoration?" Design or operation considerations to enhance salmon restoration. Looking for options, conceptual level study, create legacy document from REV6 starting point for feasibility work. Demonstrate the interaction of REV6. Have study before January 2016 to present to Core Committee. Need to understand entrainment, knowing impacts on entrainment from REV5 to REV6 impacts are not fully understood. Spawning success is also needed for consideration. Impacts of REV6 to spawning habitat. (in mid-Columbia reach: Hydraulic model, depths and velocity) Kinbasket & Revelstoke – "low level of nutrients under 50 mg/c/m2 / day" Karen Bray (November 2015). This draft AIR doesn't give any summary of the overall process and methodologies used to identify and assess the potential effects of the proposed project.	BC Hydro engaged R2 to assess any opportunities for the Project to aid in any potential future fish passage at Revelstoke Dam. The report is complete and available. The Fish Entrainment Strategy is considering entrainment at the facility as a whole. Habitat and productivity are considered in the assessment. Section 3 of the AIR covers assessment methodology and Table 4 in the Valued Components document provides a summary of intended methods for evaluating the VCs.		BC Hydro engaged R2 to assess any opportunities for the Project to aid in any potential future fish passage at Revelstoke Dam. The report is complete and available. The Fish Entrainment Strategy is considering entrainment at the facility as a whole. Habitat and productivity are considered in the assessment. Section 3 of the dAIR covers assessment methodology and Table 4 in the Valued Components document provides a summary of intended methods for evaluating the VCs.
316	2016, April 25	Nancy Bonneau	Westbank First Nation		1) There is a need to incorporate additional intangible Value Components such as, cultural, governance, heritage and some aspects of archaeology (as defined by Syilx). 2) "Residual effects of other past, present or reasonably foreseeable projects and activities", based upon this definition Salmon should be considered as a Value Component. 3) There is also a benthic affect between the Salmon and the sturgeon, as discussed in the April 5, 2016 meeting, Sturgeon feed off of Salmon, Sturgeon numbers are stagnant and this can be related to their insufficient supply of salmon as a food source. Sturgeon numbers are a concern to Syilx Nation. 4) Baseline used for determining REV6 affects are the REV5 studies and some of those studies are still incomplete. For example, Plagec is ongoing until 2019, 5) The timeframe for gathering data needs to be disclosed, when is the field work happening for baseline studies? Time of year? Duration? 6) Value, baseline description, best practices, residual, and significance all need clear definitions	1) The Heritage and Archaeology candidate VC has been split into 'First Nations Cultural Heritage' and 'Historical and Archaeological Heritage'. First Nations Cultural Heritage, including intangible value components, will be assessed by First Nations in Part C of the Application. However, if there are any Intangible Value Components identified in Section C that include additional information related to historical or archaeological resources this will be incorporated or referenced in the Historical or Archaeological Heritage Resource Section. 2) There are no potential interactions between the Project and salmon, and therefore they have not been selected as a VC. 3) This interest is acknowledged; however, anadromous salmon are not included in the scope of the EA. Revelstoke Unit 6 project activities and operations will not preclude the ongoing potential for future fish passage or fish resource use of		
317	2016, April 25	Nancy Bonneau	Westbank First Nation	Under Effects on Reservoir Water Velocities	"Although there would be a greater discharge capacity at Revelstoke Dam with the five units, the width of the withdrawal area would be widened to accommodate the unit and, consequently, velocities would essentially remain unchanged". Has this been tested and shown to be accurate?	A comparison of intake velocities will be provided in the assessment.		A comparison of intake velocities will be provided in the assessment. See Section 4.1 in the dAIR.
318	2016, April 25	Nancy Bonneau	Westbank First Nation	Effects on Water Velocity	"Between Revelstoke Dam and the confluence with the Jordan River (6 KM downstream), velocity is far more responsive to changes in discharge due to the reach being relatively narrow and confined. The Jordan-Illecillewaet reach (6 – 12 KM downstream) is wider and less confined, which leads to a lower sensitivity of velocity to discharge."Has this been tested and shown to be accurate? And also, this statement does not mention the additional volume that will be moving at an increased velocity. This does not state what the velocity is at 6 KM downstream	Agree, generally, discharge increases more quickly in a confined channel than a wide channel with a floodplain because the cross sectional area increases more slowly in a confined channel. Hydrological characteristics including changes to discharge and velocity will be included in the assessment.		Section 4.1.2 Hydrology

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319	2016, April 25	Nancy Bonneau	Westbank First Nation	Impacts on Bank Stability	adding a fifth unit at Revelstoke Dam would increase the hydraulic forces acting on the river bank, which could increase the potential for erosion of the river banks, particularly if they are already in an unstable or failing condition. This could result in the increased removal of slumped, fine grained sediments that have accumulated at the base of unstable or over-steepened river banks. In addition, an increase in water level fluctuations by up to 0.5 m would increase the height of the bank that is exposed to potential erosion. This effect would be greatest upstream of the Highway Bridge. The effect would decrease with distance downstream, and would be negligible 18 KM downstream of the dam (near Begbie Creek). Increased water level fluctuations and increased shear stresses on the banks would tend to increase rates of bank erosion at existing unstable bank sections."	The EA will discuss changes in bank erosion associated with REV 6		Refer to Sections 4.1.2 (Hydrology) and 4.1.3 (Fluvial Geomorphology) of the dAIR.
320	2016, April 25	Nancy Bonneau	Westbank First Nation		"At the Revelstoke 5 Technical and Core Committee meetings, it was recommended that a pilot bank protection program be implemented, which could be coordinated with the revegetation program and physical works being undertaken as part of the Columbia River Water Use Plan." Has this happened? What are the results of this protection program? Success or fail?	See CLBWORKS 35		CLBWORKS 35 was initiated to develop and implement a bank erosion mitigation and monitoring program to identify and address current and future shoreline erosion concerns attributable to the Revelstoke Unit 5 project downstream of Revelstoke Dam between the TransCanada Highway Bridge and Begbie Creek. Erosion protection (bioengineering) was installed in 2010, with monitoring implemented in 2011, 2012 2013 and 2015. This project is now complete. The bioengineering treatments did not perform to effectively. Based on this experience, it has been recommended that a modified approach to bioengineering, including more robust lower bank features (such as a cobble or riprap toe), would be better able to remain stable in the characteristic flow velocity and water level environment of these sites
321	2016, April 25	Nancy Bonneau	Westbank First Nation	Residual Impacts	"The monitoring and mitigation program is expected to identify and address current and future shoreline erosion concerns down stream of Revelstoke Dam. Sites identified as 'high priority' would be subject to a pilot monitoring and mitigation project to test the effectiveness of various bank protection measures. … some residual impacts are expected to occur" What are the results of these monitoring and mitigation programs? This would have further impacts if Rev6 generator is operational. Who determined the 'high priority' sites? There were 57 commitments made in REV5; Were they met?	See CLBWORKS 33, 35 and 36 and updated REV 5 commitments table		CLBWORKS 33 is a boat launch project and is not related to shoreline erosion, it has been included in error. CLBWORKS 35 was initiated to develop and implement a bank erosion mitigation and monitoring program to identify and address current and future shoreline erosion concerns attributable to the Revelstoke Unit 5 project downstream of Revelstoke Dam between the TransCanada Highway Bridge and Begbie Creek. Erosion protection (bioengineering) was installed in 2010, with monitoring implemented in 2011, 2012 2013 and 2015. This project is now complete. The bioengineering treatments did not perform to effectively. Based on this experience, it has been recommended that a modified approach to bioengineering, including more robust lower bank features (such as a cobble or riprap toe), would be better able to remain
322	2016, April 25	Nancy Bonneau	Westbank First Nation		Syilx, including Westbank First Nation were not included within the REV5 studies.	Consultation on REV5 was carried out through the Okanagan Nation Alliance on behalf of its member communities. The Okanagan Nation Alliance provided an Aboriginal Interest and Use study related to the Project.		
323	2016, April 25	Nancy Bonneau	Westbank First Nation	CLBMON #50	Heritage Monitoring Wind and Wave Erosion Year 3 report Millennia Research Limited (March 21, 2012) Reported that archaeology sites were affected by the Rev5 Wind and Wave action from the Revelstoke 5 generator installation. One of the two locations studied during the field research included the Revelstoke Reach (mid-Columbia River) between Revelstoke and Shelter Bay, BC. Archaeology Site EfQm-4, "Field observations suggest that the bank bordering the southern edge of the EfQm-4 monitoring station has eroded between Years 1 and 3 … Erosion and "islands" of original sediment isolated from the current bank edge were recorded during Year 1 and scan data indicates these are continuing to erode." The field monitoring at this archaeology site included 50 spots of those 50 spots 28 were relocated in their original location. Also, "eight of the recorded monitoring points moved, between 10 cm and 227 cm with a median of 43 cm."	Comment acknowledged. The CLBMON-50 Wind and Wave Erosion study results for site EfQm-4 will be used in the effects assessment modelling for REV6.		Comment acknowledged. The CLBMON-50 Wind and Wave Erosion study results for site EfQm-4 will be used in the effects assessment modelling for REV6 as listed in Section 16 of the dAIR. See also Section 7 (Heritage Effects Assessment) of the dAIR.

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324	2016, April 25	Nancy Bonneau	Westbank First Nation	CLBMON #50	Archaeology Site EfQn-10, this site is on the west side of Revelstoke Reach at the mouth of Begbie Creek. "Choquette (2008) identified the site as being at potential risk of increased erosion from the Revelstoke Unit 5 project".Twenty six spots were identified as areas for monitoring at this archaeology site. Data from the monitoring program was compared to 2007 orthophoto and this shows erosion occurring.	Comment acknowledged. The CLBMON-50 Wind and Wave Erosion study results for site EfQm-4 will be used in the effects assessment modelling for REV6.		Comment acknowledged. The CLBMON-50 Wind and Wave Erosion study results for site EfQm-4 will be used in the effects assessment modelling for REV6 as listed in Section 16 of the dAIR. See also Section 7 (Heritage Effects Assessment) of the dAIR.
325	2016, April 25	Nancy Bonneau	Westbank First Nation	CLBMON #50	Archaeology Site EfQn-12, the report on the field monitoring stated, "it appears in general that deposits at the norther end of the monitoring station are eroding and deposits are accreting toward its southern end." Other indications that erosion is occurring included in this report states, "Two of the monitoring points which could not be relocated were situated in areas of accretion and it is possible they are present but buried; one is in an area of erosion and the other in a small erosion/accretion transition. All of the items moved down slope between 14 cm and 129 cm, with a median of 37 cm, and generally moved southward, although two of the four moved to the northwest."	Comment acknowledged. The CLBMON-50 Wind and Wave Erosion study results for site EfQm-4 will be used in the effects assessment modelling for REV6.		Comment acknowledged. The CLBMON-50 Wind and Wave Erosion study results for site EfQm-4 will be used in the effects assessment modelling for REV6 as listed in Section 16 of the dAIR. See also Section 7 (Heritage Effects Assessment) of the dAIR.
326	2016, April 25	Nancy Bonneau	Westbank First Nation	CLBMON #50	Archaeology Site DlQm-15, 2013 site visit by Ursus, a human mandible was located. Again in 2014 another portion of ancestral remains were located at this same archaeology site. These are determined to be First Nation ancestry and are of very high concern to the Syilx people and are taken very seriously, the erosion caused from Revelstoke Dam has been the determining factor of First Nation ancestral remains being washed out from their final resting place. "The extra capacity provided by the sixth generating unit would allow the existing water supply to be used differently by releasing up to 20 per cent more water with all six units operating for short periods of time during high demand periods". https//www.bchydro.com/content/projects. (accessed April 25, 2016) This extra 20 percent increase in water release will have a 20 per cent increase in erosion rates on archaeology sites and vegetation downstream from the dam.	Comment acknowledged. We are currently waiting for hydrological and erosion modelling results for areas south of Shelter Bay. When these are received the Project team will revisit the spatial boundary and revise if appropriate. There are ongoing discussions in regards to management of this site through the Arrow Reservoir Archaeology Program Technical Working Group.		Section 7, Heritage Effects Assessment
327	2016, April 25	Nancy Bonneau	Westbank First Nation		- There hasn't been archaeological reports provided to Okanagan Nation Alliance, Westbank First Nation or Okanagan Indian Band. - There hasn't been wildlife studies / reports provided to Okanagan Nation Alliance, Westbank First Nation or Okanagan Indian Band. - There hasn't been vegetation studies / reports provided to Okanagan Nation Alliance, Westbank First Nation or Okanagan Indian Band. - At the station it was reported that, "habitat loss for young coniferous forest nesting and ground nesting migratory birds. Is within mule deer and moose winter range. Mortality notes were limited to foot print area and roads, and during nesting season." What about during calving season? What about Bitter root studies? - Dam discharge: in terms of times- "one hour per day". What does that equate to in volume? Weight? Total velocity over one hour?	Available background archaeological site information was provided to attendees from Okanagan Nation Alliance, Westbank First Nation, and Okanagan Indian Band on April 30, 2015 at the REV6 Archaeology Workshop. Additional background archaeological reports were provided to Okanagan Nation Alliance on February 25, 2016. Archaeology reports are also available on the REV6 Sharepoint site created for individual First Nations. Information pertaining to vegetation and wildlife will be provided. A list of all observed plants at the Capacitor station site is included in the EA. Calving habitat is not limited in this area; however if calving is occurring, mitigation in the Environmental Managment Plan will be considered. Dam discharge is commonly represented as cubic metres per second or cubic feet per second. More details will be provided in the		Information pertaining to ungulates is Provided in Section 4.7 Mammals. Information pertaining to dam discharge is provided in Sectin 4.1.2 Hydrology
328	2016, April 25	Nancy Bonneau	Westbank First Nation	BC Hydro's Action Items from Core Committee meetings:	In meeting # 2 BC Hydro's Action Item was to Provide a summary of the status of REV5 and other previous process commitments, but this hasn't happened, the BC Hydro status as of June 8, 2015 states this is ongoing. In Meeting # 2 BC Hydro's Action Item was to examine REV5 predicted vs. actual effects as part of the development of the REV6 assessments, as of April 29, 2015 this is stated as ongoing. No updates were given to Syilx on this action item. The base line used for REV6 is the information from the REV5 studies, so if this information isn't provided, how can Syilx, the Environmental Assessment Office or the general public understand effects of REV6? In meeting #3 BC Hydro's Action Item was to circulate the work plan for the REV6 Socio-economic assessment for input from the Community, Subcommittee. The status as of June 8, 2015 was ongoing. However, Syilx didn't receive this work plan, BC Hydro hired Golder Associates, to conduct a preliminary study on Syilx Socio-economics without Syilx input, guidance or direction. The information that was presented by Golder associates, on	BC Hydro has now completed an update summary of the status of Rev 5 commitments and predicted vs actual effects will be provided. The February 25th 2016 Golder meeting provided an overview of the Socio-economic work plan and sought input into the proposed methodology for Socio-economic effects assessment from the Syilx. Capacity funding was made available to Schedule C Nations to undertake related socio-economic studies/assessments.		

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NO	DATE	COMMENTS ORIGINATED		Topic Subject	Comments	RESPONSE	If unsatisfactory - Comments	Responses
		Name	Affiliation			What		
329	2016, April 26	Dawn Machin	Okanagan Indian Band		Impacts to future restoration of salmon (throughout lifecycles) needs to be addressed? Also, ecosystem or holistic planning doesn't seem to be addressed.	Revelstoke Unit 6 project activities and operations will not preclude the ongoing potential for future fish passage or fish resource use of concern to First Nations. The Canadian Columbia River Intertribal Fisheries Commission (CCRIFC) has proposed the formation of a multiagency committee to start investigating the feasibility of salmon restoration in the Columbia. BC Hydro has agreed to participate in such a committee should it proceed. Ecosystem Health will be considered in the Application.	ALL COMMENTS BELOW ARE CONSIDERED TO BE "ROUND 2" COMMENTS ON THE DAIR DOCUMENT. OKIB EXPECTS THE DAIR TO BE REVISED BASED ON THESE COMMENTS. IF CHANGE IS NOT AGREED TO BY BC HYDRO, A FULSOME EXPLANATION AND RESPONSE IN THIS TABLE IS REQUIRED. IN *ADDITION, OKIB EXPECTS THE*	Salmon are not present in the regional study area of the Columbia River, therefore salmon restoration is beyond the scope of this assessment. BC Hydro recognizes the importance of this issue in the Columbia River and refers the OKIB to the CCRIFC as previously defined, and in which BC Hydro is committed to participate in and work with OKIB and other interested stakeholders to find a solution. A venue for discussion of salmon and other broader issues will be through BCH/First Nations Relationship Agreements.
330	2016, April 26	Dawn Machin	Okanagan Indian Band		Impacts of invasive species (potentially introduced through use of recreation areas) on the environment?	Introduction of invasive species through construction activities will be addressed in the Environmental Management Plan.	Invasive species are of concern in both the terrestrial and aquatic environments. As per this comment, OKIB is particularly concerned about invasive species introduced through potential increase in recreation use among other effect pathways. BCH does not address this concern adequately here or in the dAIR. OKIB requires that the dAIR	Invasive species were considered in the Plant and Land and Resource Use Sections and are noted in Appendix A, Table 2 in the dAIR. Aquatic invasive species are included in Section 4.2 Fish and Fish Habitat and is included in the dAIR Section 13.0 Management Plans
331	2016, April 26	Dawn Machin	Okanagan Indian Band		Are there any issues with the TOR for the project	The Application Information Requirements (essentially the TOR for the EA) is under review as part of the EA and consultative process		
332	2016, April 26	Dawn Machin	Okanagan Indian Band		Significant changes are determined by the proponent, so how do we ensure that our communities concerns are adequately addressed.	BC Hydro will continue to work with communities to understand and find appropriate ways to respond to community concerns.	BCHs response has not in any way addressed this comment. OKIB requests resources to be able to identify qualitative and quantitative thresholds for determining significance ourselves, and to be able to do our own signficance estimation and determination according to these self-identified thresholds. This request would be satisfied if a fulsome cumulative effects	BCH has provided funding for First Nations to assess effects on their interests related to the REV 6 project. A venue for discussion of broader issues will be through BCH/First Nations Relationship Agreements.
333	2016, April 26	Fabian Alexis	Okanagan Indian Band	POTENTIONAL EFFECTS FOR REV 6	In the AIR document we recommend change all references from ABORIGINAL TO INDIGENOUS	BC Hydro has requested direction from the EAO on this topic		0

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334	2016, April 26	Fabian Alexis	Okanagan Indian Band	POTENTIONAL EFFECTS FOR REV 6	Bank stabilization and erosion is concern; How will BCH monitor, evaluate and modify weak, unstable areas?	Potential effects on erosion are being considered in the EA.	OKIBs concerns regarding bank stabilization are two fold: 1) ecological and 2) historical/archeological. To these ends, BCH has not adequately addressed OKIB concerns regarding erosion and bank stability. OKIB requires that effects related to erosion and bank stabilization are addressed in both section 4.3 Ecological Communities VC and section	Potential effects on erosion are being considered in the EA. Refer to Section 4.1 of the dAIR.
335	2016, April 26	Fabian Alexis	Okanagan Indian Band	POTENTIONAL EFFECTS FOR REV 6	Failed re-vegetation on right bank of Columbia (Big Eddy Side Channel). What measures are being taken to continue to revegetate with high level flooding of reservoir?	Potential effects on vegetation are being considered in the EA.	OKIB is highlighting concerns attibutable to ongoing, current effects of the existing Revelstoke Generating Units. Failure to re-vegetate the river bank adjacent to the Big Eddy Side Channel is an issue that requires immediate attention and solutions from BCH. OKIB requires that BCH provide information on the measures they are taking to immediately	The current effects of the existing Revelstoke Generating Units will be described in the existing conditions sections for each VC in the application. The focus of the environmental assessment is the potential changes in the VC's related to the installation and operation for the sixth unit. Potential effects on vegetation are being considered in the EA as outlined in Section 4.1 of the dAIR. Erosion related information is provided in the existing conditions section of Sections 4.3 Ecological Communities and in the Social Background Section of the Socio-economic Section 6.1
336	2016, April 26	Fabian Alexis	Okanagan Indian Band	POTENTIONAL EFFECTS FOR REV 6	What are all the valued components that the three Indigenous groups identified in the EA process?	A workshop was held on July 23/2014 to build an understanding of valued components (VCs) process from issue identification to selection of VCs for use in the Environmental Assessment (EA) and to provide a forum for direct input into the development of VCs. Issues, candidate VCs and VCs were identified with input from potentially affected FN. The process is described in greater depth in Appendix A of dAIR (VC selection document).	OKIB unfortunately were not able to attend the meetings. Upon review of Table 1 (Appendix A), we see that candidate VCs were identified by "Aboriginal groups" and other parties. OKIB have several concerns with the VCs. These are: (a) water quality was eliminated as a VC because only potential interaction is deemed to be through	Water Quality was assessed with respect to this Project. However, it was not identified as a stand alone VC as it formed an intermediate step along the identified pathway of effects. Water was not the end receptor, Fish were. As a result, water quality in the Revelstoke Reservoir was studied to support the Fish and Fish Habitat VC. A report was created on the Water Quality baseline and can be appended to the Application for reference. Air Quality was assessed for this Project. However, it was not identified as a VC because it forms an intermediate step along the pathway of identified Project-related effects. The end receptors, those VCs affected by potential changes in Air Quality include, herptiles, birds and community wellbeing VCs. A description of the potential changes in Air Quality as result of the Project, including potential dust and air
337	2016, April 26	Fabian Alexis	Okanagan Indian Band	POTENTIONAL EFFECTS FOR REV 6	Historically the salmon is not listed as a valued component and BCH has not mitigated for fish loss since Revelstoke Dam was constructed; how will loss of harvest, sustenance, and ceremonial and species restoration be mitigated?	This interest is acknowledged; however, anadromous salmon are not included in the scope of the EA. Revelstoke Unit 6 project activities and operations will not preclude the ongoing potential for future fish passage or fish resource use of concern to First Nations. The Canadian Columbia River Intertribal Fisheries Commission (CCRIFC) has proposed the formation of a multiagency committee to start investigating the feasibility of salmon restoration in the Columbia. BC Hydro has agreed to participate in such a committee should it proceed	OKIB is interested in questions related to the cumulative impacts of the proposed project. As such, it is imperative that the historical context is properly understood to demonstrate the seriousness of impact on OKIB's right to fish over time. The activities presented herein are *not* amenable to restoration activities and, indeed, may make it more difficult to conduct any desired restoration activities. OKIB acknowledges that BC Hydro is participating in the	Salmon are not present in the regional study area of the Columbia River, therefore salmon restoration is beyond the scope of this assessment. BC Hydro recognizes the importance of this issue in the Columbia River and refers the OKIB to the CCRIFC as previously defined, and in which BC Hydro is committed to participate in and work with OKIB and other interested stakeholders to find a solution. The temporal boundaries of the cumulative effects assessments, where conducted, consider the effects of past projects and activities (Please see dAIR Section 3.10.)

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338	2016, April 26	Fabian Alexis	Okanagan Indian Band	POTENTIONAL EFFECTS FOR REV 6	Has BCH discussed with other hydro dams such as Waneta, Chief Joseph and Grand Coulee the issue of no fish passage at these facilities?? If not, this needs to be included in the Columbian water treaty talks and negotiations.	Revelstoke Unit 6 project activities and operations will not preclude the ongoing potential for future fish passage or fish resource use of concern to First Nations. The Canadian Columbia River Intertribal Fisheries Commission (CCRIFC) has proposed the formation of a multiagency committee to start investigating the feasibility of salmon restoration in the Columbia. BC Hydro has agreed to participate in such a committee should it proceed	OKIB agrees that the Revelstoke Unit 6 Project will not preclude future fish passage or fish resource use; however, the proposed activity results in effects operating in the same direction of effect as the previous BC Hydro impacts on these values (in other words, installation of Unit 6 is *not* a restoration activity). As such, consideration of these larger questions	Consideration of these larger questions regarding cumulative effects and related stewardship initiatives are warranted, however it is not appropriate to consider them as part of this environmental assessment process. In addition, see responses 337 and 329. A venue for discussion of broader issues will be through BCH/First Nations Relationship Agreements.
339	2016, April 26	Fabian Alexis	Okanagan Indian Band	POTENTIONAL EFFECTS FOR REV 6	Traditional use studies need to be conducted by First Nation groups not just for Revelstoke Reservoir but expand focus scope to Keenleyside Dam; Dam study area (52 kms) is too small area to focus on.	BC Hydro provides funding to First Nations for TUS. The First Nation communities define the areas to be studied based on their relationship to the land and resource use.	OKIB was not contacted by BC Hydro regarding funding for a TUS. As stated in our original comment OKIB is very interested in undertaking a TUS. As our comments note, above, our interest is in regional and cumulative effects on the Columbia as it relates to Aboriginal rights. OKIB requests that funding be commensurate with our interest in conducting a	The capacity funding provided to OKIB includes funding for TUS studies that were identified by OKIB.
340	2016, April 26	Fabian Alexis	Okanagan Indian Band	POTENTIONAL EFFECTS FOR REV 6	Assessment of current and future fish habitat for fish is not clearly defined and determined. Every situation is done through modelling; for example during peak discharge for Rev 6 plus WL will this degrade/scour out sturgeon and resident fish spawning?	Assessment of maximum discharge effects on downstream fish and fish habitat is included in the VC.	Section 4.2 (and associated appendices) does not specifically include conducting studies on the potential ecosystem effects to fish and fish habitatVCs at maximum discharge. OKIB requests that water flow and velocity be specifically listed in the following sections related to Fish and Fish Habitat: 1) as an environmental pillar in all three	Flow and velocity are described in the interactions columns of Appendix A and are prominent in the example pathway of effects. The Indicator description in the dAIR will be changed from Fish Habitat (bank type, substrate) to Fish Habitat (velocity) as that matches the assessment. BC Hydro is not directing First Nations in how to author Part C, and therefore has not designated specific indicators beyond "Information provided by Aboriginal communities or Aboriginal coordinators" for all Traditional Use and Knowledge Sub-Components. The First Nations authors of Part C may choose to include velocity as an indicator in their contributions.
341	2016, April 26	Fabian Alexis	Okanagan Indian Band	POTENTIONAL EFFECTS FOR REV 6	How will BCH ensure fish will remain and feed after high discharge? Will high discharge blow out all the fish food?	Assessment of the potential effects of higher discharge is included in the EA using a combination of modelling, existing data and knowledge, and expert opinion.	Potential effects of higher discharge rates is not explicitly included in any proposed indicators relative to Fish and Fish Habitat nor are the proposed methods for review and data collection adequate to fully understand the potential ecological impacts of flow rates and water velocity to fish and fish habitat. OKIB requests that water velocity be included as a proposed	The Indicator description in the dAIR was changed from Fish Habitat (bank type, substrate) to Fish Habitat (velocity) to match the Assessment. An overview of the methodology is provided in the dAIR Section 3.3 and details of the methodology to assess fish and fish habitat is included in Section 4.2.

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342	2016, April 26	Fabian Alexis	Okanagan Indian Band	POTENTIONAL EFFECTS FOR REV 6	Traditional Use Study (TUS) – All should be done by Indigenous groups not hired hand consultants.	BC Hydro has provided funds to Nations to undertake Rev 6 TUS. The choice of consultants is at the discretion of the Nations.	As per above comment, OKIB was not contacted by BC Hydro regarding funding for a TUS.	The capacity funding provided to OKIB includes funding for TUS studies that were identified by OKIB.
343	2016, April 26	Fabian Alexis	Okanagan Indian Band	POTENTIONAL EFFECTS FOR REV 6	Economic development – Regional, local, and First Nations businesses and contracting profiles – Revelstoke Reservoir and transmission/capacitor these studies need FN involvement	BC Hydro agrees and welcomes the involvement of First Nations in Economic Development assessments.	OKIB is developing a socio-economic baseline, including a workforce readiness survey. 1) OKIB requires that the results from this Nation-specific socioeconomic study be incorporated into the Economic Effects Assessment section of the EA. 2) So that OKIB can ensure our information is not misrepresented	1) BC Hydro will make every reasonable effort to incorporate information received before filing the application. 2) OKIB will have the opportunity to review and comment on the Application once it is filed. Any modifications to the material can be made at this time. 3) EAO to respond
344	2016, April 26	Fabian Alexis	Okanagan Indian Band	POTENTIONAL EFFECTS FOR REV 6	Number of First Nation workers during construction and monitoring; this needs to be negotiated and direct awarded	The number of First Nation workers during construction and monitoring will be addressed during mitigation and monitoring discussions	See comment above.	As above
345	2016, April 26	Fabian Alexis	Okanagan Indian Band	POTENTIONAL EFFECTS FOR REV 6	Human Health – Electromagnetic effects. What studies have been done on humans and animals and is it cancer causing?	A discussion of EMF as it is applicable to this project will be included in the EA	EMF is a significant perceived risk to OKIB members. We request that a thorough assessment of the effects of changes in EMF be included in section 8.2 Human Health and that communications materials (print and presentation) about the effects of EMF are developed for distribution to our membership	EMF assessment is included in Section 8.2. A booklet entitled "Understanding Electric and Magnetic Fields" is available on bchydro.com
346	2016, April 26	Fabian Alexis	Okanagan Indian Band	POTENTIONAL EFFECTS FOR REV 6	For the capacitor station under the Okanagan Nation Alliance, why is Upper Similkameen Band and no other Bands included on the list?	For the Capacitor Station, Upper Similkameen are identified by the BC EAO on Schedule B indicating that Upper Similkameen are to be notified about the Project. Other Okanagan bands including Penticton Indian Band and West Bank First Nation are identified on Schedule C which indicates they are to be consulted about the Project		0
347	2016, April 26	Fabian Alexis	Okanagan Indian Band	POTENTIONAL EFFECTS FOR REV 6	Under abbreviations and acronyms mission is OKIB – Okanagan Indian Band and SNTC – Shuswap Nation Tribal Council	Agreed, to be updated.		Agreed, updated.
348	2016, April 26	Fabian Alexis	Okanagan Indian Band	POTENTIONAL EFFECTS FOR REV 6	What is the estimated lifespan of Rev 1-4? Are there plans to update those generators? If so, when?	The life span of Units 1-4 is estimated to be 50 years, BC Hydro will be upgrading items on a component by component basis as needed.	OKIB requests that the AIR be revised to include lifespan and upgrading plans for the existing dam components under bullet #7 in section 1.1 Desprciption of the Proposed project.	dAIR to be updated : the life span of Units 1-4 is estimated to be 50 years, BCH will be upgrading items on a component by component basis as needed.
349	2016, April 26	Fabian Alexis	Okanagan Indian Band	POTENTIONAL EFFECTS FOR REV 6	Acknowledgement of the significance of water for Syilx peoples; water management and the protection of aquatic ecosystems need to be addressed	BC Hydro acknowledges the importance of water for Syilx people and will continue to seek the input of Syilx in areas of water management and the protection of aquatic ecosystems.	OKIB Water Rights go hand in hand with water management and the protection of aquatic ecosystems. See comments in lines 153, 167 and 169. If those comments are addressed, then this item is also addressed.	The dAIR has been updated in Section 4.1 to include the acknowledgement of the intrinsic and cultural value of water to First Nations. The application addresses intrinsic and cultural values of water in Part C. Aquatic ecosystems are assessed as outlined in Section 4.2 of the dAIR, fish and fish habitat and terrestrial ecosystems that may interact with aquatic ecosystems are assessed as outlined in Section 4.3, Ecological Communities .

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350	2016, April 26	Fabian Alexis	Okanagan Indian Band	POTENTIONAL EFFECTS FOR REV 6	First Nations Water Rights	To be considered in Part C of the EA.	Part C of the dAIR does not make mention of specific requirements for water rights to be considered. As outlined above, changes to fish and fishing rights are a serious concern for OKIB. Water quality and flow is therefore also a serious concern as it is directly related to fish, fishing, and navigation based Aborginal rights, as well as the right to clean water that is tied directly to	OKIB has the opportunity to address water rights in a fashion selected by OKIB in Part C. BC Hydro will work closely with First Nations to ensure that information collected on their membership is properly conveyed.
351	2016, April 26	Fabian Alexis	Okanagan Indian Band	POTENTIONAL EFFECTS FOR REV 6	Water quality and quantity – for fish and humans	Water quality and quantity for fish is discussed in the Fish and Fish Habitat VC section. There are no potential interactions between the Project and water quality or quantity related to human use.	As previously stated, OKIB requests that water quality be added as a VC.	Water Quality was assessed with respect to this Project. However, it was not identified as a stand alone VC as it formed an intermediate step along the identified pathway of effects. Water was not the end receptor, Fish were. As a result, water quality in the Revelstoke Reservoir was studied to support the Fish and Fish Habitat VC. A report was created on the Water Quality baseline and can be appended to the Application for reference.
352	2016, April 26	Fabian Alexis	Okanagan Indian Band	POTENTIONAL EFFECTS FOR REV 6	Loss of harvesting and gathering – culturally important plants, animals and minerals (food, sustenance, medicinal, ceremonial)	To be considered in Part C of the EA.	See comment above. Clearly, Part C does not specify information requirements in sufficient detail to allay the concerns that water rights and loss of harvesting and gathering rights will be assessed appropriately	OKIB has the opportunity to address water rights and loss of harvesting and gathering rights in a fashion selected by OKIB in Part C
353	2016, April 26	Fabian Alexis	Okanagan Indian Band	POTENTIONAL EFFECTS FOR REV 6	Birds nesting in flood plain- no recovery or mitigation for loss	Bird nest mortality is an indicator and is discussed within the Bird VC Section	OKIB requests that BCH give equal weighting to "equivalent experience" when it comes to hiring monitors and field technicians. OKIB requests to have an Okanagan Nation knowledge-holders participate in fieldwork surveys related to birds and bird nesting sites.	BC Hydro will continue to involve First Nations including consideration of equivalent experience and knowledge- holders when hiring monitors and field technicians. Bird nest mortality is an indicator (Table 2 Section 3.1) and is discussed within the Bird VC Section 4.6.
354	2016, April 26	Fabian Alexis	Okanagan Indian Band	POTENTIONAL EFFECTS FOR REV 6	BCH does not have to rescue stranded fish or other aquatic species; they need to be held accountable and have recovery plans	BC Hydro fulfils its obligations with respect to fish stranding.	OKIB requests that BCH give equal weighting to "equivalent experience" when it comes to hiring monitors and field technicians We would like to see Okanagan Nation knowledge-holders participate in fieldwork surveys related to fish and fish habitat and 2)that recovery plans for fish stranding be detailed in the 'Mitigation Measures' and 'Residual	BC Hydro will continue to involve First Nations including consideration of equivalent experience and knowledge- holders when hiring monitors and field technicians. Recovery plans for construction related fish stranding will be developed as required.

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355	2016, April 26	Fabian Alexis	Okanagan Indian Band	POTENTIONAL EFFECTS FOR REV 6	Critical habitat and resources; protection or ecological process for example SARA	The only critical habitat identified within the two Local Study Area (LSA)s is related to caribou. This is discussed within the Mammal VC Section	Eventhough Caribou may be the only SARA listed species with critical habitat in the LSA, there are a number of other species of conservation concern listed federally (SARA) and provincially (red and blue) within the project area (e.g. white sturgeon, bull trout, burbot, kokanee). OKIB requests that plans for mitigating effects on these sensitive species be addressed in	The assessement of White Sturgeon, Bull Trout, Burbot, and kokanee is specifically addressed in Section 4.2 of the dAIR. If there are environmental effects on these species, the required mitigation measures will be described in the application.
356	2016, April 26	Fabian Alexis	Okanagan Indian Band	POTENTIONAL EFFECTS FOR REV 6	Economic and social effects assessment needs to be done by First Nations not consultants hired by BCH	Capacity funding has been provided to support First Nations in undertaking economic and social effects assessment	OKIB has not yet signed a capacity agreement with BCH and as a result, only limited capacity funding has been issued to date. OKIB requests that funds to engage in the EA, as well as funds to conduct a scoioeconmic effects assessment as per our proposal, be released as soon as possible to ensure that we are able to meet deadline imposed by	There is a signed capacity funding agreement with BC Hydro. The current agreement is being amended to include scoio-economic effects assessment. Employment readiness and food security specific to First Nations will be included in Part C.
357	2016, April 26	Fabian Alexis	Okanagan Indian Band	POTENTIONAL EFFECTS FOR REV 6	First Nation communities need to benefit with long term jobs from Rev 6 – research studies, monitoring, evaluation	BC Hydro will continue to work with First Nations to identify and maximize potential benefits associated with Rev 6.	As per comment above, OKIB requests that the results from our own socioeconomic study be incorporated into the Economic Effects Asseessment	The information will be incorporated into Section 6.2 (Socio-Community) of the EA.
358	2016, April 26	Fabian Alexis	Okanagan Indian Band	POTENTIONAL EFFECTS FOR REV 6	Impacts on riparian areas, loss of diversity and habitat for animals and plants	The assessment of biodiversity and riparian areas is included within the Ecological Communities VC Section.		The requirements for the assessment of biodiversity and riparian areas are included in Section 4.3, Ecological Communities, of the dAIR.
359	2016, April 26	Fabian Alexis	Okanagan Indian Band	POTENTIONAL EFFECTS FOR REV 6	Dam and energy production – its footprint impacts on habitat, social, cultural significances	Concerns noted	OKIB is interestested in ensuring that cumulative effects and legacy impacts of the Revelstoke Dam on habitat, social and cultural aspects are assessed. Consideration of these larger questions regarding cumulative effects and related initiatives are warranted and should be included in the EA Application and EA methodology. See comments	The current effects of the existing Revelstoke Generating Units will be described in the existing conditions sections for each VC in the application. The focus of the environmental assessment is the potential changes in the VC's related to the installation and operation for the sixth unit. Consideration of these larger questions regarding cumulative effects and related stewardship initiatives are warranted, however it is not appropriate to consider them as part of this environmental assessment process.
360	2016, April 26	Fabian Alexis	Okanagan Indian Band	POTENTIONAL EFFECTS FOR REV 6	BC Hydro is very slow to provide capacity funding to OKIB community but still pressures to have certain aspects of EA process done that is not adequate consultation	Capacity Funding Agreement has been signed with OKIB.	This is incorrect. A capacity agreement has not yet been signed with OKIB. OKIB requests that a capacity agreement be signed as soon as possible	A capacity funding agreement with OKIB incorporating an agreed upon budget exists.

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361	2016, April 26	Amy Spoinka	Ministry of Energy and Mines		Under the Assessment of Potential socio-economic effects, extend estimation of local government expenditures and revenues to include regional expenditures and revenues as well.	The Local Study Area (LSA) for the Local Government Finance VC includes Revelstoke and the Electoral Area B of the Columba Shuswap Regional District. Other economic VCs including Labour Market and Economic development are assessed at the regional level (i.e. Columbia Shuswap Regional District).		A description of the Local Study Area including maps is provided in the Preface to the dAIR. The Local Study Area (LSA) for the Local Government Finance VC includes Revelstoke and the Electoral Area B of the Columba Shuswap Regional District. Other economic VCs including Labour Market and Economic development are assessed at the regional level (i.e. Columbia Shuswap Regional District).
362	2016, April 26	Alan Mason	Core-Committee - Alan Mason		4th line : Cut off for cumulative effects assessment is listed as Dec 31, 2015??	The cut off date has been revised to September 30th, 2016.		0
363	2016, April 26	Alan Mason	Core-Committee - Alan Mason		last paragraph references all city planning documents. Please ensure the Revelstoke ICSP is specifically referenced throughout when mention is made of city planning documents	The Revelstoke ICSP is specifically referenced in regard to affordable housing in Section 6.2, Socio-community.		Rental housing availability and affordability and housing market inventory and sales are indicators for accomodation. These are listed in Table 2 Section 3.1 and outlined in Section 6.2 of the dAIR. The Revelstoke ICSP is specifically referenced in regard to affordable housing in Section 6.2, Socio-community.
364	2016, April 26	Alan Mason	Core-Committee - Alan Mason		bullets at top: ensure mention is made of project contribution to affordable housing	Availability and affordability of rental housing and temporary accommodation is assessed in Section 6.2, Socio-community assessment.		0
365	2016, April 26	Alan Mason	Core-Committee - Alan Mason		2nd last paragraph: ensure mention of erosion to golf course lands.	Erosion and inundation of golf course lands are addressed in Section 6.3 Land and Resource Use.		The golf course is noted in Table 1 Appendix A of the dAIR. The potential for erosion and inundation of golf course lands are addressed in Section 6.3 Land and Resource Use in the EA.
366	2016, April 26	Alan Mason	Core-Committee - Alan Mason		cell 6 references dust and air emissions. This could be a major issue with several gravel extraction projects underway or proposed for the Westside Rd area. Cumulative impacts from all these projects could be a concern.	mitigation measures for dust and air emissions during construction will be provided in the Environmental Management Plan		Dust and air emissions are noted in Table 1 of Appendix A to the dAIR. Air quality is an IC.
367	2016, April 26	Alan Mason	Core-Committee - Alan Mason		cell 7 mentions "Bathville Rd."- I'm not sure where that is.	More context in cell 7 will be provided to clarify location of Bathville rd. near the proposed capacitor station in Summerland.		More context in cell 7 of Table 1 in Appendix A of the dAIR has been provided to clarify location of Bathville rd. near the proposed capacitor station in Summerland.
368	2016, April 26	Alan Mason	Core-Committee - Alan Mason		Mt Biking should be noted as another activity that could be impacted	Section 6.3, Land and Resource Use considers Project effects on Outdoor Recreation and Tourism activities including mountain biking.		Section 6.3 of the EA (Land and Resource Use) considers Project effects on Outdoor Recreation and Tourism activities including mountain biking.
369	2016, April 26	Alan Mason	Core-Committee - Alan Mason		should recreation be included in this chart?	There is no effect pathway between the Socio-community VCs increased demand on accommodation and increased demand for local infrastructure.		
370	2016, April 26	Alan Mason	Core-Committee - Alan Mason		like to see noise be included as a VC rather than an	Noise has been selected as an IC because it is a pathway of effect to potential receptors including birds and herptiles. The potential effects related to changes in noise are adequately addressed in the assessment.		Noise has been selected as an IC because it is a pathway of effect to potential receptors including birds and herptiles. The potential effects of noise on project VCs and subcomponents is outlined in Table 4 of Appendix A of the dAIR.
371	2016, April 26	Alan Mason	Core-Committee - Alan Mason		Community Infrastructure and Service. Proposed methods should also include study of the timing of the workforce influx. There are periods when there are more workers than others; the pattern is not uniform. That is good info to have for planning mitigation measures.	Information regarding timing workforce requirements throughout the construction period is presented in Section 6.2 Socio-Community and informs analysis tied to workforce requirements.		Assessment of temporal effects on labour market is outlined in Section 5.2 of the dAIR. Information regarding timing workforce requirements throughout the construction period is presented in Section 5.2 Socio-Community of the EA and informs analysis tied to workforce requirements .
372	2016, May 03	Christina Yamada	Interior Health	Groundwater and Surface Water Quality	This should be selected as a VC due to impacts from increased sediment and erosion, changes in quality due to diverting watercourses to facilitate access, removal of draft tube plug material, impacts from treatment of construction process water and changes to flow velocity and water levels (see #15 in Table 1 of Valued Components Draft Report).	There are no planned diversions of watercourses associated with this project. There were no residual effects associated with the plug removal during the Revelstoke 5 project and similarly no residual effects associated with plug removal for the 6th unit are expected. Treatment for construction process water is regulated and permitted through other government processes. Changes to flow velocity and water levels are not expected to result in a measurable change in water quality or human health.	The proponent has not addressed changes to water quality due to increased sediment and erosion.	Potential Project changes in water quality will be described in the application. Data used in the assessment is taken from current and ongoing studies. These current data are also compared to earlier data to evaluate trends and provide context.
373	2016, May 03	Christina Yamada	Interior Health	Human Health	The proponent has not considered impacts on human health from project effects on groundwater and surface water quality (see above) and country foods (see above and Appendix A of draft AIR).	There are no planned diversions of watercourses associated with this project. There were no residual effects associated with the plug removal during the Revelstoke 5 project and similarly no residual effects associated with plug removal for the 6th unit are expected. Treatment for construction process water is regulated and permitted through other government processes. Changes to flow velocity and water levels are not expected to result in a measurable change in water quality or human health. Consideration of effects on country foods will be addressed in Part C of the Application.	Consider impacts on human health from effets on water quality due to increased sediment and erosion.	For REV 6 project, there is no interaction between project effects and water quality that can be linked to human health.

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374	2016, May 03	Christina Yamada	Interior Health	Noise	The project will change ambient sound during construction yet the proponent has not considered the impacts on humans as a receptor.	The localized nature of the changes in sound, short duration, and the experience related to the Revelstoke 5 indicate that health effects related to noise associated with the Project are not expected.		0
375	2016, March 25	Michael Zimmer	Okanagan Indian Band	Fish Passage	-currently there are no considerations for fish passage at REV. Fish (sturgeon, bull trout, kokanee, rainbow trout, mountain whitefish, largescale and longnose sucker, burbot) migrate through the Columbia River Revelstoke Reach or are entrained by REV and have no means of moving upstream of REV. -concurrent aboriginal (and basin-wide, non-aboriginal stakeholders) interests include reintroduction of anadromous fishes (i.e., salmon) throughout their historical range including upstream of REV. -how will fish passage limitations be mitigated?	This interest is acknowledged; however, anadromous salmon are not included in the scope of the EA. Revelstoke Unit 6 project activities and operations will not preclude the ongoing potential for future fish passage or fish resource use of concern to First Nations. The Canadian Columbia River Intertribal Fisheries Commission (CCRIFC) has proposed the formation of a multiagency committee to start investigating the feasibility of salmon restoration in the Columbia. BC Hydro has agreed to participate in such a committee should it proceed	OKIB's rights and interests in the project area have been significantly impacted over time, especially with regards to fish. Our interest in related to cumulative impacts of the proposed project. See comments in lines 154 and 155. If those comments are addressed, this comment is also addressed.	Salmon are not present in the regional study area of the Columbia River, therefore salmon restoration is beyond the scope of this assessment. BC Hydro recognizes the importance of this issue in the Columbia River and refers the OKIB to the CCRIFC as previously defined, and in which BC Hydro is committed to participate in and work with OKIB and other interested stakeholders to find a solution. Consideration of these larger questions regarding cumulative effects and related stewardship initiatives are warranted, however it is not appropriate to consider them as part of this environmental assessment process. The temporal boundaries of the cumulative effects assessments, where conducted, consider the effects of past projects and activities (Please see dAIR Section 3.10.)
376	2016, March 25	Michael Zimmer	Okanagan Indian Band	Velocity	-increase in maximum discharge from 75 to 93 kcfs will increase downstream velocities. What effect will this have on holding (swimming speeds), feeding (foraging ability, food availability), and spawning (suitable habitat, redd/nest/egg scour) of all fish listed above, and include the weaker swimming minnows and sculpin (red side shiner, peamouth, sculpin spp.)? -SARA listed sturgeon in the Arrow/Revelstoke complex are only known to spawn in the Columbia River adjacent Revelstoke Golf Course (a few kms downstream of REV). How will REV 6 affect spawning and larval dispersal/survival? -Spawning of Bull Trout, Rainbow Trout, and Mountain Whitefish downstream of REV? -potential spawning use (habitat suitability) of re-introduced anadromous fishes? - increased velocity will exacerbate substrate movement (boulder, cobble, gravel, sand, etc.). How will this affect (macro) pool and riffle and (micro) interstitial habitats downstream? - how will important substrates (boulder, cobble, gravel, sand) be replenished with little to no substrate migration from above	These issues are considered and descibed in the EA.	Increases to downstream velocitys at maximum discharge pose a significant risk to fish and fish habitat, but this is not currently explicitly included as a proposed indicator for the fish and fish habitat VC. OKIB reuqests that flow rates and water velocity be included as an indicator for the Fish and Fish habitat VC. See comments in lines 157 and 158. If those comments are addressed, this comment is	The Indicator description in the dAIR was changed from Fish Habitat (bank type, substrate) to Fish Habitat (velocity) as that matches the assessment. Methodological details are included in the application Section 4.2 Fish and Fish Habitat
377	2016, March 25	Michael Zimmer	Okanagan Indian Band	Stranding	-higher fluctuations in flows will 1) inundate higher elevations in the "floodplain" below REV, 2) subsequent higher velocities will cause fish to seek lower velocity areas in these areas, 3) dropping flows will exacerbate stranding risk and kills -higher periods of higher flows may support colonization of newly wetted habitats by algae and benthos (insects, arthropods, mussels). Dropping of flows post colonization may increase kills	Stranding is discussed in the Fish and Fish Habitat VC	Increases to downstream velocitys at maximum discharge pose a significant risk to fish and fish habitat, but this is not currently explicitly included as a proposed indicator for the fish and fish habitat VC. OKIB reuqests that flow rates and water velocity be included as an indicator for the Fish and Fish habitat VC. See comments in lines 157 and 158. If those comments are	Stranding is discussed in the Fish and Fish Habitat VC, Appendix A, Section 4.2 and Table 2 Section 3.1 of the dAIR. The Indicator description in the dAIR was changed from Fish Habitat (bank type, substrate) to Fish Habitat (velocity) as that matches the assessment. Methodological details are included in the application. Section 4.2 fish and Fish Habitat

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378	2016, March 25	Michael Zimmer	Okanagan Indian Band	Water Quality	-Water temperature will influence spawning behavior of fishes. Also, important to note any temperature changes (different from current operations) on spawning of sturgeon. -changes in Total dissolved gases and pressure on aquatic life downstream? -What will be the effect on turbidity/clarity from the increase in discharge?	Water quality is discussed in the Fish and Fish Habitat VC	Water quality is discussed in the Fish and Fish Habitat VC, however the proposed methodology relevant to Water Quality as it relates to Fish and Fish Habitat is reliant on existing studies (Table 4, Section 2.4, Appendix A). OKIB requests that all water quality assessments related to the Fish and Fish Habitat VC are conducted using current data (conducted within the last	Water quality is an indicator of the Fish and Fish Habitat VC as noted in Table 2 of Section 3.1 of the dAIR. Water quality data used in the assessment is taken from current and ongoing studies. Data available as of Nov 1, 2015 when the assessment was written is used in the report. These current data are also compared to earlier data to evaluate trends and provide context.
379	2014, May 29	Don Whyte	Property Owner	Proposed Capacitor Station - Summerland Area	Opportunity to discuss issues: - industrial nature thus reduce the property value and general desirability of the area - potential negative impacts from noise, light pollution, aesthetics , health impacts, recreational potential and moose habitat due to the potential new capacitor station in the Summerland area.	We can advise that environmental assessment at the capacitor station site included wildlife studies. BC Hydro will work with the community if the capacitor station were to be built we would certainly work with the community through our public engagement process to address any concerns related to noise, lighting, aesthetics, recreation and health. All BC Hydro facilities and infrastructure meet the safety and health guidelines set out for electric and magnetic fields (EMF). For more information about EMF, please visit BC Hydro's website: https://www.BC Hydroydro.com/safety-outages/keeping-communities-safe/health-electricity.html, including a link to a booklet called Understanding Electric and Magnetic Fields [PDF].		We can advise that environmental assessment at the capacitor station site included wildlife studies, see Sections 4.7 through 4.9 of the dAIR. BC Hydro will work with the community if the capacitor station were to be built we would certainly work with the community through our public engagement process to address any concerns related to noise, lighting, aesthetics, recreation (see Section 6 of the dAIR) and health. All BC Hydro facilities and infrastructure meet the safety and health guide lines set out for electric and magnetic fields (EMF). For more information about EMF, please visit BC Hydro's website: https://www.BC Hydroydro.com/safety-outages/keeping-communities-safe/health-electricity.html, including a link to a booklet called Understanding Electric and Magnetic Fields [PDF]. Theses issues are discussed in Section 4.1 Air and Noise, Section 6
381	2014, June 16	Don Whyte	Property Owner	Reply : Bathville Reponse Letter	Is there a date when the decision is made that it is to "go ahead" or not. Is it possible that we be notified that this project is no longer on the table; or will this be something that is perpetually looming as a possibility.	Currently, the earliest in-service date is 2021. To meet this date, we would need to initiate the construction in 2017. This time frame may be extended, as the planned in-service date is 2025.		0
382	2014, June 16	Don Whyte	Property Owner	Reply : Bathville Reponse Letter	We see media reports indicating the new turbines are being built and preparations made to install into the dam. Is there a possibility that the turbine work will be completed but the capacitor station in our area will not be needed or built? Or is it more likely that if the turbine work is undertaken to completion the capacitor station will be needed?	No physical work is currently underway at the dam as part of the Revelstoke 6 Project. The turbines currently being installed are for the Mica 5 & 6 Project at the Mica Dam and Generating Station located 135 kilometres north of Revelstoke. That project is not related to the potential need for a capacitor station at the BC Hydro property on Bathville Road. The capacitor station will only be required if the REV6 project proceeds.		0
383	2014, June 16	Don Whyte		Reply : Bathville Reponse Letter	List of BC Hydro capacitor stations located within the southern interior of BC. Also, please identify any capacitor stations that are located within a residential area where people's homes are located within a kilometer of the capacitor site.	We currently have eleven capacitor stations in operation on the BC Hydro system. We don't know have any capacitor stations in the vicinity of the capacitor station site on Bathville Road.		No map will be provided as other capacitor stations are operated province wide and are not related to this project. Capacitor stations within the southern interior of BC are the Guichon Creek Capacitor Station near Logan Lake and the Seymour Arm Capacitor Station located near Seymour Arm.
384	2014, June 16	Don Whyte		Reply : Bathville Reponse Letter	We would like to understand the reason why BC Hydro chose the Bathville Road location option over the potential location on the Summerland/Princeton road.	The BC Hydro-owned property on Bathville Road was selected due to its suitability for a capacitor station given factors such as its proximity to the transmission line, elevation, access, topography and the location along this particular 500,000 volt transmission line which links the Vaseux Substation near Oliver to the Nicola Substation near Merritt.		0
385	2014, July 09	Don Whyte		Reply : Proposed Capacitor Station - Summerland Area	Please provide the location of any one of the number that you mention that are located in close proximity to a residential community. Particularly if such a situation exists within the southern interior of BC.	BC Hydro is preparing this information		0

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386	2016, May 09	Fabian Alexis	Okanagan Indian Band	Additional concerns from the Syilx people	In the event of an earthquake, how safe is the Revelstoke dam?	The Revelstoke Dam is designed to withstand extreme ground motions associated with earthquakes, up to and including a peak value of 0.2g, with a very low annual likelihood of occurrence of approximately 1 in 10,000.	OKIB is evidently concerned about the ability of the dam to withstand seismic activity. OKIB requires that an Emergency Management Plan be developed in Part E.	The risk of a sudden failure for Mica or Revelstoke dam is extremely low, and the vast majority of dam safety incidents at Revelstoke or Mica would not result in a catastrophic dam failure, even in the case of an extreme earthquake. BC Hydro's monitoring systems are designed to provide advance warning of possible issues (including movements of known slides) and allow BC Hydro to take actions such as controlled releases of water to eliminate or reduce the risk of sudden failure. BC Hydro has a strong, internationally-recognized dam safety program that includes continual monitoring of dams to detect possible concerns and makes safety investments to ensure any deficiencies are addressed. BC Hydro's dam safety program is aligned and integrated with its water management and emergency management programs. Emergency plans are in place at all our facilities to identify and address
387	2016, May 09	Fabian Alexis	Okanagan Indian Band	Additional concerns from the Syilx people	What magnitude of seismic movement will Revelstoke dam sustain before breaching?	See above	See comment in line 195, above.	Confirmed line 195 of the OKIB tracking document dated Dec 12, 2016 references seismic issues
388	2016, May 09	Fabian Alexis	Okanagan Indian Band	Additional concerns from the Syilx people	What studies have an occurred on aquatic insects; more importantly what effects does the practice of raising river volumes up and down every day which is known as "hydropeaking"- to meet hourly electricity demands. One American study https://www.cbbulleti	The most recent (and ongoing) study in the MCR is CLBMON-15b Mid Columbia River Ecological Productivity. Annual reports are available on the BC Hydro website.	Hydropeaking and aquatic insect health are not addressed in the dAIR. Hydropeaking has been found to impact the diversity of life downstream from a dam and should therefor be addressed in the dAIR. OKIB requests that hydropeaking, its' effects and mitigations be added to the information requirements identified in section 4.3 Ecological Communities in the dAIR	Inundation associated with peaking is one of the major focuses of the assessment. The level of inundation associated with water releases with both 5 and 6 units is provided hourly for a number of downstream sites in Section 4.3 (Appendix 4.3-III). The impacts are considered for vegetation, herptiles, birds and mammals. To date the incremental effects to these groups is not measurable.
389	2015, March 05			Cumulative Effects Assessment	Consider the draft federal technical guidance for cumulative effects assessment.	Though the EA is provincial, both provincial and federal guidance are considered in the Methodology.		Though the EA is provincial, both provincial and federal guidance are considered in the Methodology. See Section 3 in the dAIR.
390	2015, May 13			REV5 Effects	BC Hydro to determine how to best provide substantive reporting of REV5 simulations and observations through the Technical Task Groups. BC Hydro to explore the possibility of examining REV5 simulated vs. actual effects as part of the development of the REV6 assessment.	A description of the REV5 hydrology simulations vs. actual operations was reviewed with the TTG in June. The information will be included as an appendix to the Application. REV5 predicted effects vs. observations will be included in the baseline description of each VC where possible in the REV6 EA.		A description of the REV5 hydrology simulations vs. actual operations was reviewed with the TTG in June. The information will be included as an appendix to the Application. REV5 predicted effects vs. observations will be included in the baseline description of each VC where possible in the REV6 EA. An update on the status of actual vs simulated effects of REV 5 was provided to First Nations in July 2016.
391	2015, May 13			Socio-Community	BC Hydro to circulate the work plan for the REV6 socio-economic assessment for input from the Community Sub-Committee.	Socio-economic scope of work is included in the dAIR which has been reviewed by the Core Committee and is available online. The Socio-economic work plan was circulated to the Community Sub-Committee members in November, 2015.		0
392	2014, January 23			Socio-Community	Consider the feasibility of providing training funds to Nakusp, Golden, and Salmon Arm (in addition to providing funds to Revelstoke as was done for REV 5).	This will be considered during the EA.		This will be considered during the EA. Refer to section 5.2.2 of the dAIR
393	2014, January 23			Socio-Community	Confirm the schedule for when the decision would be made regarding training funds and when they would be available if the REV 6 project goes ahead with a 2020 in-service date.	BC Hydro plans to provide the trades training funding in advance of the start of the Project Construction Phase in order to provide the opportunity for workers to obtain training in time to apply for work on the Project.		0
394	2014, January 23				Provide the Community Sub-committee with the forecasted workers for REV 5 and the actual number of workers for REV 5. Include the actual number of local and First Nations hires for the REV 5 project.	Information regarding the forecasted and actual number of workers for Rev 5, including local and First Nations hires is included in Section 6.2 Socio-community.		Information regarding the forecasted and actual number of workers for Rev 5, including local and First Nations hires is included in the EA. Refer to section 5.2 Economy of the dAIR
395	2014, January 23				Assess the potential effect of the REV 6 project on rental rates and rental availability in the City of Revelstoke and present the results to the Community Sub-committee.	Potential Project effects to availability and affordability of temporary accommodation in Revelstoke is addressed in Section 6.2 Socio-community.		Potential Project effects to availability and affordability of temporary accommodation in Revelstoke is addressed in Section 6.2 Socio-community of the EA. Refer to Section 6.2 of the dAIR

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396	2014, January 23				To provide accommodation space for workers with camper vans, look into the use of the Rapid Attack Base Camp that forest fighters used or other potential spaces for long-term camping.	This will be considered during the Assessment as a mitigation option.		Options for accomodation space for workers will be considered during the Assessment as a mitigation option. Refer to Section 6.2 of the dAIR, Section 6.2.2.3.2.1 Project Residual Effects on Housing and Accomodation.
397	2014, January 23				Project team to investigate issues experienced during REV 5 construction in regards to preferential local hiring and follow-up with Community Sub-committee. These issues include: 1) potential barrier for local workers that are not members of the unions working on the project (especially if the union is not accepting new members); 2) potential misrepresentation of workers as "local" (i.e. non-local workers may be able to get a local post office box address and new driver's license to meet the "local" definition); 3) potential lack of awareness amongst contractors of the CHC requirements for local and First Nations hiring. Note: Also look into the REV5 and Mica 5/6 provincial audits of commitments in the Environmental Assessment Certificate to see if local/First Nations hiring was audited.	Information regarding the experience from Rev 5 regarding employment is included in Section 5.2, Economy.		Information regarding the experience from Rev 5 regarding employment is included in Section 5.2, Economy. Refer to Section 5.2 of the dAIR. Measures to enhance the training and hiring of local and First Nations workers is discussed in section 5.4.3.1.
398	2014, January 23				Update the labour estimate for REV 6 to list person hours by trade and the corresponding union if applicable.	Labour estimates for Rev 6 are included in Section 5.2 Economy.		Labour estimates for Rev 6 are included in Section 5.2 Economy. Refer to Section 5.2 of the dAIR. The information is provided in person years by trade, Section 5.4.1.1.1, Table 5-21 Construction Occupation Demand
399	2014, January 23				Follow-up with Columbia Basin Trust (Neil Mooth) to see if their fund could provide assistance union dues for local workers that want to work on the REV 6 project (e.g. union dues).	BC Hydro to consider.		This would be discussed as part of the Collaborative Planning for training and hiring mitigation measure
400	2014, January 23				Follow-up with the Social and Economic Development contact at the City of Revelstoke (get contact info from Alan Mason) to inquire if there was a spike in the demand of social services during the REV 5 construction and post-construction period.	Interviews were held with representatives of the City of Revelstoke to discuss social issues during Rev 5 and concerns regarding Rev 6. This information is included in Section 6.2 Socio-community.		Interviews were held with representatives of the City of Revelstoke to discuss social issues during Rev 5 and concerns regarding Rev 6. This information is included in Section 6.2 Socio-community. Refer to Section 6.2 of the dAIR
401	2014, January 23				Provide update to the Community Sub-committee meeting on the Centennial Park Boat Ramp and the Old Highway Boat Launch in Revelstoke Reservoir.	BC Hydro's planned project to upgrade the ramp according to recommendations of the Columbia River WUP was cancelled by the provincial Comptroller of Water Rights after the City of Revelstoke raised concerns about the safety of the ramp. In Revelstoke Reservoir, there is an informal boat ramp just above Revelstoke Dam at 5-mile. BC Hydro does not own that boat ramp nor has any responsibility to maintain boater access at that site. To meet the public recreation clause of our water licence for Revelstoke Reservoir, BC Hydro purchased land and paid for the development of a number of recreational sites that were subsequently transferred to other organizations. These sites included Martha Creek Provincial Park, Downie Creek Recreation Site, and Columbia View Picnic Area (site just below the dam that was transferred to the City of Revelstoke and is currently leased		
402	2014, January 23				Review performance measures for Revelstoke Reservoir preferred elevation and frequency of drawdown and incorporate Community Sub-committee feedback. These performance measures will be used to evaluate the effects of REV 6 on recreational and industrial transport on the reservoir.	There will be no change to normal operating range in Revelstoke Reservoir, and daily fluctuations would be similar for REV5 and REV 6.		0
403	2014, January 23				Provide a description of the 60 historical water years used in the GOM modeling simulations and the wet/dry/average years for province and Columbia Basin.	This will be provided in the EA.		This will be provided in the EA. Refer to Section 4.1 of the dAIR. Section 4.1.2 Hydrology and 4.1.3 Fluvial Geomorphology, 4.1.1.2 Inflow Hydrology Data Used in HYSIM and GOM
404	2014, January 23				Review GOM simulations and HEC-RAS modelling of water surface elevations to investigate the potential incremental effect of REV 6 on flooding risk at the Revelstoke Golf Course.	Change in surface water elevations with regards to the golf course lands are addressed in Section 6.3 Land and Resource Use.		Change in surface water elevations with regards to the golf course lands are addressed in Section 6.3 Land and Resource Use.Refer to Section 6.3 of the dAIR
405	2014, January 23				Explore the opportunity to identify solutions to improve drainage at the Revelstoke Golf Course.	Change in surface water elevations with regards to the golf course lands are addressed in Section 6.3 Land and Resource Use.		Change in surface water elevations with regards to the golf course lands are addressed in Section 6.3 Land and Resource Use.Refer to Section 6.3 of the dAIR

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406	2014, January 23				Look into if buoys in the Mid-Columbia River should be evaluated in the REV 6 process to ensure adequacy for river boating safety.	BC Hydro does not plan to install buoys in the Mid-Columbia River as part of the REV6 project as no incremental effects on public safety have been identified with the addition of the 6th Unit. To address boater safety, BC Hydro installed a public safety boom across the Columbia River downstream of Revelstoke Dam in November 2014. Large DANGER signs have also been installed on either side of the river channel.		
407	2014, January 23				Present the results of the HECRAS modeling study that will provide information on potential impacts on properties between the Revelstoke Dam and the golf course with REV 6 operations.	Potential impacts to properties assessed using a TELEMAC - 2D model, are discussed in Section 6.3.		Potential impacts to properties assessed using a TELEMAC - 2D model, are discussed in Section 6.3.Refer to Section 6.3 of the dAIR
408	2014, January 23				Review the available information for archaeology sites in the REV6 project area and: 1) explore methods for investigating the potential incremental effects of REV 6 on these sites; 2) identify data gaps, particularly in regards to Revelstoke Reservoir.	Available information for archaeology sites within the REV6 Project Area will be included in the EA. Methods for investigation the potential incremental effects of REV6 on documented archaeological sites were discussed at the November 2015 Technical Task Group (TTG) meetings and for undocumented sites will be discussed at the September 2016 TTG meetings. For the MCR archaeological modelling the REV6 Secwepemc TTG subcommittee archaeologists on behalf of the TTG is designing a methodology to address gaps and inconsistencies in the existing dataset. For the Revelstoke Reservoir activities related to the normal operating range/water fluctuations are not anticipated to interact with historical or archaeological heritage resources as no impacts to sediments where heritage resources may be situated are anticipated. However, increased daily fluctuations of		Available information for archaeology sites within the REV6 Project Area will be included in the EA. Methods for investigation the potential incremental effects of REV6 on documented archaeological sites were discussed at the November 2015 Technical Task Group (TTG) meetings and for undocumented sites will be discussed at the September 2016 TTG meetings. For the MCR archaeological modelling the REV6 Secwepemc TTG subcommittee archaeologists on behalf of the TTG is designing a methodology to address gaps and inconsistencies in the existing dataset. For the Revelstoke Reservoir activities related to the normal operating range/water fluctuations are not anticipated to interact with historical or archaeological heritage resources as no impacts to sediments where heritage resources
409	2014, January 23				Investigate the incremental effect of REV 6 on standing water (and corresponding effect to mosquitoes).	No potential interactions were identified between the Project and prevelance of mosquitoes.		
410	2015, June 25				For the REV5 observed operations ($REV5_O$), describe the context of the 9 exceedances below the reservoir normal low elevation. Doug D. Robinson to circulate a technical memo.	The exceedances below the reservoir normal low elevation are described in Section 3.3 of the Appendix describing REV5 Operations (this appendix is referenced in section 4.1.1 of Draft 2). The drafts below El. 571.5 m occur occasionally due to unusual operational or weather-related conditions (e.g. outages at other plants, cold snaps, etc.). These events are independent of the number of units at REV, however the number of units may influence the final depth and duration of any draft below El. 571.5 m.		Completed. The exceedances below the reservoir normal low elevation are described in Section 3.3 of the Appendix describing REV5 Operations (this appendix is referenced in section 4.1.1 of Draft 2). The drafts below El. 571.5 m occur occasionally due to unusual operational or weather-related conditions (e.g. outages at other plants, cold snaps, etc.). These events are independent of the number of units at REV, however the number of units may influence the final depth and duration of any draft below El. 571.5 m.
411	2015, June 25				Further review results and describe how operations are simulated to change with REV6 and Site C in operation (e.g., investigate further the potential impact of more time at minimum flow in spring with Site C). Doug D. Robinson to circulate a technical memo.	This refers to operations simulations using either the contingency resource plan (without Site C included) or the base resource plan (with Site C), and is discussed in Section 4.1.1.10.4 of Draft 2. An analysis comparing both showed an insensitivity to changes in the resource plans.		
412	2015, June 25				Perform a sensitivity analysis of the performance measures (PMs) with all of the different scenarios ($REV5_S$, $REV6_S$ and $REV6+WL_S$).	Sensitivity analyses will be included as appropriate.		
413	2015, June 25				Examine climate change by pulling water years from the record that match the archetype of predicted climate change ($REV5_S$, $REV6_S$ and $REV6+WL_S$).	A technical memo on climate change has been written by Doug D. Robinson and will be summarized for the EA.		A technical memo on climate change has been written by Doug D. Robinson and will be summarized for the EA. Climate change is discussed in Section 4.1 and Section 10 of the dAIR.
414	2015, November 18				Barry to ensure that Barry's sediment report includes a description of the difference between local events (e.g. local steepening and movement) as well as the overall big picture	Changes to local Fluvial Geomorphology are described in the EACA, Section 4.1.2 and 4.1.2.		

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NO	DATE	COMMENTS ORIGINATED		Topic Subject	Comments	RESPONSE	If unsatisfactory - Comments	Responses
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415	2015, November 18				EA Project Team to take a 'weight-of-evidence' approach to assessing potential fish habitat impacts in the Mid-Columbia River. TTG members provided substantive input on the task and the challenges of corroborating modelling approaches with ongoing WLR fish monitoring results. In the end, it was agreed that the best approach would be to use a weight-of-evidence approach (i.e., combining modelling results, fish monitoring results and professional judgements) on a species-by-species basis, while identifying key uncertainties.	A weight of evidence approach will be applied.		This is an analytical approach used during the assaessment.
416	2016, April 15				Regarding TDG Management strategy, BC Hydro to confirm if: 1) The draft TDG strategy is available to share with the TTG; 2) The TDG strategy will incorporate pre & post REV6 monitoring.	1. TDG Strategy will be included as an appendix to the EA. 2. Monitoring at REV will follow recommendations made in the TDG Risk Assessment (scheduled for completion this year). Pre-post monitoring would be completed where necessary to fill data gaps.		
417	2016, April 15				Regarding white sturgeon, BC Hydro to: 1) Confirm with Jamie that larval stranding is not an issue; 2) Circulate spawning substrate report.	James Crossman confirmed that larval stranding is not an issue for white sturgeon, and the spawning substrate report is available on the BC Hydro website as CLBMON-20.		
418	2016, April 15				Regarding primary productivity analyses, BC Hydro to consider: 1) Adding all months of the growing season into the assessment of primary productivity; 2) Examining the hydrological conditions of other months to see if September and April are representative; 3) Looking at different GOM years when ALR levels are different (high, medium, low) to see whether the results vary; 4) Examining and describing the characteristics of the "wet" and "dry" years. BC Hydro to: a) Use the 3-D model to assess whether there is a potential for near bottom velocity effects on primary productivity stripping; b) Compare 3D and 2D model results.	1) All months except for August were run through the unsteady state model. May, July, Sep and Oct are presented in the EA as being representative of operating and biologically productive months. 2) See above. 3) See Hydrology section for rationale on choosing the 1975 and 1992 water years. 4) "Wet" and "dry" years are descirbed in the Hydrology section of the EA. a) This has been done and can be discussed at the next TTG. b) This has been done to the extent possible and will be discussed at the next TTG.		
419	2015, October 01				Shawn to consider the following references suggested by Anne Moody: 1) Strategic Environmental Initiatives Program (SEIP) studies; 2) Old mapping from 80s (Anne to send); 3) Dam Impacts report by Moody, Stockner, and Slaney; 4) Chris Perrin's insect study; 5) Old mapping from 90s (Anne to send)	Information that has been received has been assessed and included where appropriate		
420	2015, October 01				Shawn to consider the following references suggested by Francis: 1) Selkirk College dam impact study (Francis to send); 2) 1948 topographical maps; 3) 4-year western toad mortality study (Francis to summarize his observation in a 2-page summary); 4) John Woods Parks Canada study on reservoir elevation and Canada geese; 5) Josh Korman's analysis.	Information that has been received has been assessed and included where appropriate		
421	2015, October 01				Shawn to consider the following references suggested by Marlene: 1) Dam impact reports; 2) 2002-2009 FWCP reports for herons in the Columbia Basin.	FWCP heron report (2009) has been cited. Information from the dam impact summary report has been included - notably in the Bird VC and Ecological Communities VC Sections.		
422	2015, October 01				Consider how to incorporate Josh Korman's work on vegetation bands (based on duration of inundation) in the drawdown zone. Discuss with Anne Moody.	Potential impacts have been discussed in terms of elevation bands within the Draw Down Zone (DDZ), and are consistent with more recent WUP reporting.		
423	2016, April 13				SNC to review critical habitat polygons and provide an opinion of their value to caribou recovery. SNC to investigate whether the Federal government maintains a budget for caribou critical habitat.	Critical habitat for caribou is discussed within the Mammals VC Section. Awaiting response from the federal government regarding caribou management budget.		
424	2016, April 13				For the construction phase, SNC to: 1) Assess potential effects of lighting on birds that are active at night; 2) Assess potential effects of increased Westside Road traffic load on herptiles.	Potential effects of lighting and increased traffic are discussed in the EA.		
425	2016, April 13				SNC/BC Hydro to: 1. Consider the appropriateness of the studies being referenced in the EA. Are they answering the right questions to inform the EA of REV6+WL or other questions? Are they done at the right time and recently enough? 2. Consider providing more detail (e.g., 2-3 sentences on methodology applied) and referencing specific page numbers of reports that are cited to help guide the reader. 3. Consider adding more context to the EA on environmental thresholds for ecological communities. The question of concern is, are we approaching these thresholds?	The surveys completed for the WUP and other programs included considerable effort within the Local Study Area (LSA) and data collected are sufficient to inform the EA. The WUP studies contain information pertinent to the EA (notably information that informs a Sub-component Indicator) and was included in the EA. Additional detail was provided in the baseline sections and the citations of references followed standard practices for citation of scientific publications. The use of species within the draw down zone and effects of current operations informed the baseline of many VC reports. Where residual effects are identified, significance criteria or threshold will be described in the Application. The assessment considered current operations when determining if there was a measureable effect as a result of adding a 6th unit.		

REV6 Comments Tracking Table
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426	2016, April 13				For the capacitor site, consider how the capacitor site right-of-way is currently managed (i.e., is it mowed, do cows graze there, are chemicals used to control vegetation?) and what the winter access is like (is it plowed?).	Vegetation management (mowing) and grazing occur on the ROW. Further details regarding existing conditions at the site are provided in the EA.		
427	2016, April 13				SNC / BC Hydro to: 1. Consider including a steady state modelling run for REV4 (maximum flows of 60kcfs) for context and comparison to REV5 and REV6+WL. 2. Consider including a steady state modelling run for minimum flows (5kcfs) because minimum flows also have effects. 3. Consider using an ALR elevation of 434 m (rather than 435 m as is currently done) because it is more reflective of the established vegetative community and aligns with the soft constraint target set in the WUP for bird nesting and vegetation establishment.	Model results presented in the report are based on the unsteady state as it was deemed to be more representative of future operations.		
428	2016, April 13				SNC to provide a table that summarizes each location selected for unsteady state model assessment, including: 1) Site name; 2) Specific point selected (i.e., GPS coordinates and elevation); 3) Rationale for location selected (e.g., invert for water inflow/outflow); 4) VCs / Ecological significnace of the site (e.g., vegetation communities, wildlife species, etc.)	This information was provided to TTG on May 26th, 2016		
429	2016, April 13				SNC to consider these questions when assessing the potential effects of going from REV5 to REV6+WL flows on sites in the MCR: 1. How much water is there (elevation, depth)? 2. How often does the water level fluctuate (frequency)? 3. How fast does the water elevation rise (ramping)? 4. How long does it stay there (duration)? 5. When does it happen (season)? 6. Can we look at these across different time scales (monthly, weekly, daily)?	For each month modelled (April, May, June, July, September) the average water level, maximum water level, minimum water level and time inundated was compared between 5 units and 6 units in operation. In addition, the hourly changes were plotted at a number of sites to show the differences between the two scenarios and the two modelled years - these were discussed in relation species use at sensitive times of the year (e.g., amphibian and bird breeding)		
430	2016, April 13				SNC to consider including: 1. March – important for amphibians 2. May 1 to Sept 30 – important for the entire the growing season 3. Winter months – important for erosion	Most wetland sites for which modelling was completed (Downie Marsh, Airport Marsh, Lower Airport Marsh, Montana Slough, Cartier Bay) did not show inundation until May or June. Modelled months for changes in inundation included April through September - excluding August. August was excluded as results were deemed to be similar for either July or September. The erosion modelling used an unsteady state model with the Arrow Lakes Reservoir at three different elevations, regardless of season		
431	2015, November 19				Eva to adjust definition of VC to account for the stratigraphic context being disturbed (e.g. the relationship between the artifacts and the location)	This was completed. VC subcomponent description now states the following: Locations with protected archaeological or historical heritage sites, landscapes, landforms, features, stratigraphy, and artifacts		
432	2015, November 19				Wayne to provide correct location for Site EFQN113	Corrected location for EfQn-13 has not been provided and location recorded in Provincial Heritage Database was used for the assessment of accessibility and erosion. If the corrected location is provided general hazard erosion mapping will be used to assess whether there are any project interactions in regards to erosion.		
433	2015, November 19				EA Project Team to redevelop performance measure for erosion risk to unknown sites and report back to TTG at next meeting. There was significant discussion on the proposed method for assessing effects to unknown archaeology sites. In general, the TTG discussed a process for determining erosion risk throughout the MCR (based on NHC's work), and then developing a predictive model for understanding where landforms have high potential for the presence of archaeology sites. The idea was to overlay the erosion risk areas with areas of high archaeological site potential to determine the areas of highest priority for ground-truthing and inventory. The TTG agreed that this method needed further work and the EA project team would report back on their progress in the next meeting.	Performance measures for erosion risk were revised by SNC and will be included in Draft 2 of the Application and presented at the next TTG. An archaeological potential model and a general erosion hazard model are being developed and progress will be presented at the next TTG meetings. Four teleconference meetings with interested First Nations have taken place in regards to the development of an archaeological potential model (April 28, May 10, 12, & 20 2016). This work is ongoing.		
434	2015, November 19				Eva to investigate parameters used in Williston and Site C archaeological potential models	A Millennia Research Ltd report on the Archaeological Predictive Modelling for Site C was uploaded to SharePoint on March 7th, 2016. No data was available for the Williston archaeological potential model. A preliminary REV6 archaeological potential modelling approach was prepared by Millennia and provided to First Nations on May 2, 2016. Millennia also prepared and sent out additional information on model variables on May 12, 2016.		

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435	2015, July 08	Revelstoke Citizen		cummulative effects	While I am lacking in technical expertise, my main concern with the document and, therefore, the approach to the proposed Environmental Assessment, is the way that the Cumulative Effects Assessment is presented/defined in the document as being limited to looking at operational effects and residual effects after mitigation. To take a precautionary approach, it should not be assumed that mitigation measures will succeed in mitigating effects, therefore a cumulative effects assessment based on residual effects that are expected after mitigation will not provide a complete picture of the actual possible cumulative effects on the environment.	Residual effects are the predicted effects of the Project after the application of mitigation measures (if required). Where there are uncertainties related to mitigation, these will be described in the Application.		
436	2015, July 08	CSRD		cummulative effects	Section 3.10 of the AIR provides a list of "past, present and reasonably foreseeable future projects and activities that will, at a minimum, be considered in the cumulative effects assessment. " I would suggest adding the Shelter Bay Development lands to this list as they contain a substatial number of lakefront lots.	Noted and will be added.		completed
437	2015, July 08	CSRD		cummulative effects	Throughout the BC Hydro processes to date we have only been allowed to limit our comments and concerns to the incremental impacts of each project upgrade (ie. Additional turbines at Mica and Revelstoke dams. Our concerns regarding the cumulateve impacts of all large scale hydro projects, not the "footprint" issues are not taken into consideration and have not been dealt with adequately	Concern noted, however, the scope of the EA is to assess the incremental effects of the addition of a sixth generating unit to Revelstoke Dam.		
438	2015, July 08	Francis Maltby			Riparian vegetation loss as a result of erosion and or flooding. Both mechanisms should be recognized.	Hydrological modelling has been undertaken to examine the extent of incremental changes in flooding associated with a range of potential operating scenarios. Geomorphological assessments to understand incremental changes in erosion have been completed. This information has been used to assess potential effects of vegetation loss due to erosion and inundation (Section 4.3).		Hydrological modelling has been undertaken to examine the extent of incremental changes in flooding associated with a range of potential operating scenarios, as outlined in Section 4.1 of the dAIR. Geomorphological assessments to understand incremental changes in erosion have been completed. This information has been used to assess potential effects of vegetation loss due to erosion and inundation (Section 4.3 of the dAIR).
439	2015, July 08	Francis Maltby			The Big Eddy side channel is the only remaining large river feature of its type on the main stem between Donald BC and the Hugh Keenleyside dam at Castlegar. Its natural attributes and values should be recognized.	The Big Eddy side channel is included in Section 4.3 of the EA as a sensitive ecosystem. Section 4.3 provides information on the size, location, and descriptions of the larger wetland complexes explicitly identified by members of the Core Committee including the Big Eddy side channel. Modelling was undertaken to understand the vegetation communities as part of the sensitive ecosystem assessment in Section 4.3. The modelling information was linked with the ecosystem information to inform the assessment of potential Project effects.		Big Eddy has been added to Table 2 Section 3.1 of the dAIR. The Big Eddy side channel is included in Section 4.3 of the EA as a sensitive ecosystem. Section 4.3 provides information on the size, location, and descriptions of the larger wetland complexes explicitly identified by members of the Core Committee including the Big Eddy side channel. Modelling was undertaken to understand the vegetation communities as part of the sensitive ecosystem assessment in Section 4.3. The modelling information was linked with the ecosystem information to inform the assessment of potential Project effects.
440	2015, July 08	Francis Maltby			The Columbia River nesting islands are eroding at an accelerated rate since the commissioning of REV 5. How will this rate accelerate with REV 6	Section 4.1.1 of the EA assesses the effects of the Project on erosion at sensitive ecosystems including the MCR Nesting Islands. The Islands were incorporated into the bathymetric and sediment surveys to assess erosion potential and bar migration.		Section 4.1 of the dAIR establishes the requirements for the Hydrology and Fluvial Geomorphology studies. Section 4.1 of the EA assesses the effects of the Project on erosion at sensitive ecosystems including the MCR Nesting Islands. The Islands were incorporated into the bathymetric and sediment surveys to assess erosion potential and bar migration.
441	2015, July 08	Francis Maltby			Northwest Airport Marshes may be at risk if incision is occurring in the Columbia River Channel	As discussed in Section 4.1.1.15 of the EA, the average shear stress in the channel is generally expected to remain below the threshold to mobilize coarse surface bed material in the bars and main channel of the River under the Project case; therefore, Project-related effects on bed mobility and scour are expected to be few and to be very localized in spatial extent.		
442	2015, July 08	Francis Maltby			Key areas of concern and interest are Locke Creek, Downie Marsh, and Cartier Marsh	Locke Creek, Cartier Marsh and Downie Marsh were explicitly identified by the Core Committee, and are included in Ecological Communities VC (Sections 4.3), Herptiles VC (Section 4.5), and Birds VC (Section 4.6).		These areas are noted in Table 2, Section 3.1 of the dAIR Locks Creek, Cartier Marsh and Downie Marsh were explicitly identified by the Core Committee, and are included in Ecological Communities VC (Section 4.3), Herptiles VC (Section 4.5), and Birds VC (Section 4.6).
443		Francis Maltby			Airport marsh east of the runway is not affected by Revelstoke Dam and should not be included in the assessment	Airport Marsh is considered due to its presence within the Draw Down Zone (DDZ) in the Local Study Area (LSA) (Local Study Area (LSA)). Similar to Locke Creek, Downie Marsh, Cartier Marsh, and Big Eddy side channel, the EA assesses potential effects to this particular marsh as a result of a sixth unit.		Airport Marsh is considered due to its presence within the Draw Down Zone (DDZ) in the Local Study Area (LSA). Similar to Locks Creek, Downie Marsh, Cartier Marsh, and Big Eddy side channel, the EA assesses potential effects to this particular marsh as a result of a sixth unit.

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444		Francis Maltby			14 days for the rock slime metric is not appropriate	Rock slime productivity is considered in the Effective Littoral Zone (ELZ) metric. The ELZ metric is a performance measure to calculate the area of the littoral zone that remained productive throughout the growing season as a function of water surface elevation. The ELZ metric was calculated using a 10 day colonization period. Additionally, a second ELZ metric was calculated based on a more conservative estimate of a 30 day colonization period. These metrics were developed based on information in the literature.		
445		Francis Maltby			"River behaviour" should be replaced with more precise terms that correctly reflect physical processes such as hydropeaking or channel incision and streambank erosion	River behaviour is a common geomorphic term used in the literature to describe the processes occurring within a river system. The fluvial geomorphology assessment involved analysis of bank erosion susceptibility, changes in channel shape and dimensions, effects of excess shear stress, water level changes, and ramping rates. These analyses were guided by output parameters of the hydraulic models (water surface elevation, flow velocity and shear stress), topographic data provided by bathymetric and LiDAR surveys, and sediment survey data from various sources spanning 2009 to 2016 (Kerr Wood Leidal 2009; Kerr Wood Leidal 2012; Clague & Roberts 2015; NHC 2016).		
446		Francis Maltby			Mean river velocity does not accurately represent river behaviour such as peaking, channel incision or stream bank erosion.	Peaking, channel incision, and stream bank erosion are discussed in Section 4.1.1. of the EA. Mean river velocity is commonly used to assess channel incision or stream bank erosion. The difference between the daily max and the daily min are used to describe peaking.		
447		Francis Maltby			The assessment needs to consider recent and historic research as well as contemporary thinking on the effects and impact of river regulation on a broad range of ecosystem values	Discussion of potential effects on downstream channels following flow regulation in Section 4.1.1.14.3 of the EA incorporates findings and perspectives from historical and recent literature, including assessments from 2014 to the present. In British Columbia, long-term studies of the Peace River below the WAC Bennett Dam provide the most comprehensive assessment of morphological changes from flow regulation on a large gravel-bed river, and recent assessments of these effects have been incorporated into the EA.		Information resources are included in Section 3.3 of the dAIR. A discussion of potential effects on downstream channels following flow regulation in Section 4.1.1.14.3 of the EA incorporates findings and perspectives from historical and recent literature, including assessments from 2014 to the present. In British Columbia, long-term studies of the Peace River below the WAC Bennett Dam provide the most comprehensive assessment of morphological changes from flow regulation on a large gravel-bed river, and recent assessments of these effects have been incorporated into the EA.
CC-AM-1	2015, January	Alan Mason		Other	For Rev 5 and for Mica 5 and 6, one of the opportunities to assist local communities was the provision by BC Hydro of funds to assist with the training of local workers so that they could gain employment at the projects. For this to be successful, the funds need to be committed a reasonable time in advance of the projects so that local workers complete the training programs in time to be ready to be hired when the projects commence. If project construction is projected to begin in 2017, it would be helpful if a funding commitment could be made soon in order to organize and deliver the training programs required for local workers.	BC Hydro plans to provide the trades training funding in advance of the start of the Project Construction Phase in order to provide the opportunity for workers to obtain training in time to apply for work on the Project.		
CC-AM-2	2015, January	Alan Mason		Other	For Rev 5, one of the most significant negative impacts of the project was the additional pressure put on rental housing by the influx of well-paid workers moving to Revelstoke to work on the project. The additional workers coming to Revelstoke were able to pay much higher rents than local residents, many of whom were displaced from their rental properties and were unable to find affordable rental properties in the community. To help mitigate this, BC Hydro provided a one-time contribution of $250,000 to help the community develop additional affordable rental housing stock. It is anticipated that the same impact will result due to the installation of Rev 6. Similar to the argument made in #1 above, it would be helpful if BC Hydro could make a similar commitment soon so that the community can start to construct additional affordable housing units that will be available once the new workers start to arrive to work on the project. The Revelstoke Community Housing Society is close to completing the planning of a 12 unit affordable housing development in Revelstoke. A contribution to this project from BC Hydro in the next couple of months would be extremely beneficial to the development of this initiative	The project team will work with the City of Revelstoke to find a mutually acceptable way of addressing the concerns that have been raised.		The project team will work with the City of Revelstoke to find a mutually acceptable way of addressing the concerns that have been raised. See Section 6.2 of the dAIR
CC-CL-1	2015, January	Cory Legebokow	FLNR	Formatting	should be "Ministry of Forests, Lands, and Natural Resource Operations" (acronym - FLNR)	Accepted.		

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CC-CL-2	2015, January	Cory Legebokow	FLNR	Formatting	change acronym from MFLNRO to FLNR throughout the document	Accepted.		
CC-CL-3	2015, January	Cory Legebokow	FLNR	Fish	there may be the potential for the project to alter conditions that may be beneficial to introduced/non-native species, especially within the MCR. Although this is not a "VC", how and where should it be addressed? Perhaps it gets captured as a pressure on the fish resource VCs already identified	Invasive macrophyte species were considered in the EA. Introduction of invasive species through construction activities will be addressed in the Environmental Management Plan. Effects to Fish and Fish Habitat Section 4.2.3 The lack of measurable or distinguishable effects to the Fish and Fish Habitat VC as a result of incremental changes of the Project is a reflection of the variability and complexity of ecological interactions in the Study Area and the relative magnitude of Project influences compared to all others.		Invasive species is included in the VC document, Appendix A of the dAIR. Invasive macrophyte species were considered in the EA. Introduction of invasive species through construction activities will be addressed in the Environmental Management Plan. The lack of measurable or distinguishable effects to the Fish and Fish Habitat VC as a result of incremental changes of the Project is a reflection of the variability and complexity of ecological interactions in the Study Area and the relative magnitude of Project influences compared to all others.
CC-CL-4	2015, January	Cory Legebokow	FLNR	Ecological Communities	The correct BC Gazetted name is "Locks Creek". The document states "Locke Creek". All other references should be changed accordingly	Accepted.		
CC-CL-5	2015, January	Cory Legebokow		Fish	same comment as above regarding the potential to alter fish habitat conditions during project Operations in a manner that could benefit non-native/introduced fish species. Consideration should be given to adding this as an Issue in Table 1 or an Intermediate Component.	Invasive macrophyte species were considered in the EA. Introduction of invasive species through construction activities will be addressed in the Environmental Management Plan. Effects to Fish and Fish Habitat Section 4.2.3 The lack of measurable or distinguishable effects to the Fish and Fish Habitat VC as a result of incremental changes of the Project is a reflection of the variability and complexity of ecological interactions in the Study Area and the relative magnitude of Project influences compared to all others.		The potential to introduce invasive species is considered in Section 6.3 of the dAIR. Fish habitat conditions are discussed in Section 4.2 of the dAIR.
CC-CL-6	2015, January	Cory Legebokow		Mammals	* Table 1 - Issues Scoping, Item 30 - measures should not be taken to improve habitat for moose nor should there be an effort to mitigate impacts in relation to moose productivity. Changes in seral distribution within the RR have significantly contributed to the decline of mountain caribou. Conversion to early seral as a result of anthropogenic developments (e.g forest harvesting, transmission lines) have favoured moose production which in turn has increased predation by wolves on mountain caribou. FLNR is actively managing moose to reduce numbers to pre-development levels. This potential affect may already be covered in the proposed Mammal VC;	Acknowledged. Table 1 will be updated to reflect gov't input		completed
CC-CL-7	2015, January	Cory Legebokow		Fish	Proposed Indicators - species assemblage should be added	Acknowledged. Table 4 will be updated to reflect gov't input		completed
CC-CL-8	2015, January	Cory Legebokow		Mammals	Mountain caribou should be the primary species of concern when discussing effects on ungulates. I did not see any mention of this Red Listed species in the documents	Critical habitat for caribou is discussed within the Mammals VC Section. There are three subcomponents under the Mammals VC: Species at Risk, Ungulates, and Traditional Use and Knowledge. In the EA caribou are included in both the Species at Risk and Ungulates discussions; however, they are discussed in more detail in the Species at Risk subsection (Southern Mountain Caribou) as it precedes the Ungulates discussion.		See Section 4.7 (Mammals) of the dAIR. Critical habitat for caribou is discussed within the Mammals VC Section. There are three subcomponents under the Mammals VC: Species at Risk, Ungulates, and Traditional Use and Knowledge. In the EA caribou are included in both the Species at Risk and Ungulates discussions; however, they are discussed in more detail in the Species at Risk subsection (Southern Mountain Caribou) as it precedes the Ungulates discussion.
CC-CL-9	2015, January	Cory Legebokow		Mammals	Ungulate winter ranges - I don't believe there are any designated UWR (via GAR) within the operating ranges of MCR. As a there should be no impacts during Operations	Acknowledged.		
CC-FM-1	2015, January	Francis Maltby		AIR/VC Documents	"I find this E.A with the VCR and the AIR to be a complicated, cumbersome and not at all user friendly. ...I hope that those promoting this approach to public involvement do all the necessary work to make it understandable, accessible and meaningful to participants, to the non-specialists."	BC Hydro will work to use language that is as accessible and clear as possible in the context that these are regulatory and technical documents.		

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NO	DATE	COMMENTS ORIGINATED		Topic Subject	Comments	RESPONSE	If unsatisfactory - Comments	Responses
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CC-FM-10	2015, January	Francis Maltby		Fish	The littoral zone in Lake Revelstoke. It seems the value of and the measures chosen to protect the littoral zone were decided very early in this process. I should point out this occurred with little consultation. BC Hydro specialist presented information about the zone and then quickly presented the metric that would protect it. I will affectionately call it the "14 day rock slime" metric. To the best of my knowledge the 14 day metric was derived from fisheries research in the river below the dam. Rock slime, algae, moulds and other micro-organisms, form the base of the fish food web. Algae and others feed bugs, bugs are a valuable fish food - some fish eat the slime as well I am sure. The problem, that should be obvious, is that some of the many valuable elements of the littoral zone, large plants, associated bugs, which feed not just fish but mammals and waterbirds, take much longer than 14 days to recover from de-watering in hot dry and freezing weather. In practical terms some of the littoral vegetation has been in development for a decade or more and may take years not 14 days to recover from deep drawdown events due to reservoir operations, So why choose 14 day rock slime? I would like to revisit this so that we	The effects assessment will include operational changes from REV6 on Revelstoke Reservoir littoral habitat, including frequency, duration, and magnitude of reservoir elevation changes and will address incremental impacts if noted. Preliminary assessment information was provided to the Core Committee in the January 2014 Environment Subcommittee meeting (presentation by A.Leake); there are references to WLR studies CLBMON3 and CLBMON15b which form part of the baseline/existing conditions information.		The effects assessment will include operational changes from REV6 on Revelstoke Reservoir littoral habitat, including frequency, duration, and magnitude of reservoir elevation changes and will address incremental impacts if noted. Preliminary assessment information was provided to the Core Committee in the January 2014 Environment Subcommittee meeting (presentation by A.Leake); there are references to WLR studies CLBMON3 and CLBMON15b which form part of the baseline/existing conditions information. See Sectioin 4.4 of the dAIR There is no 14 day metric with regard to the littoral zone of Lake Revelstoke. The ELZ (Effective Littoral Zone) measure that was used to assess the incremental effect of the Project incorporated both a 10 day and a 30 day time period for
CC-FM-10A	2015, January	Francis Maltby		Fish	Was the 21-day river productivity metric (what he refers to as 14-day rock slime in his comments) in any way used for measuring impacts in the littoral zone of the reservoir?	Productivity metrics used for rivers and lake/reservoir littoral zones are different. The littoral zone assessment was calculated using recolonization rates for periphyton of 10 days and 30 days following a minimum 24 hour exposure period.		Productivity metrics used for rivers and lake/reservoir littoral zones are different. The littoral zone assessment was calculated using recolonization rates for periphyton of 10 days and 30 days following a minimum 24 hour exposure period. See Section 4.4 of the dAIR
CC-FM-10B	2015, January	Francis Maltby		Fish	Is the littoral zone of the reservoir included as a VC?	As a component of the Revelstoke Reservoir ecosystem, the littoral zone is included in the Fish and Fish Habitat VC and addressed via the indicators of habitat, aquatic productivity, and water quality on that Project Area.		As a component of the Revelstoke Reservoir ecosystem, the littoral zone is included in the Fish and Fish Habitat VC and addressed via the indicators of habitat, aquatic productivity, and water quality on that Project Area. See Section 4.4 of the dAIR
CC-FM-10C	2015, January	Francis Maltby		Fish	Has BCH done a complete inventory on the macrophyte vegetation in the reservoir via remote sensing? (e.g., at a coarse level, does BCH know where all of the macrophyte vegetation is?)	CLBMON-55 (Revelstoke Reservoir Macrophyte Assessment) was a commitment under the REV5 EA to assess macrophytes in Revelstoke Reservoir pre- and post- Unit 5 in service date. The study included the use of high resolution SPOT satellite imagery and ground-truthing methods to map macrophyte distribution in the reservoir. The study was completed in 2014 and the final report is available on the BC Hydro website.		
CC-FM-10D	2015, January	Francis Maltby		Fish	Has BCH established a performance measure or metric for capturing effects on macrophytes?	The effects of REV6 on macrophytes will be discussed in the EA.		The effects of REV6 on macrophytes will be discussed in the EA. See Section 4.4 of the dAIR
CC-FM-11	2015, January	Francis Maltby			I would like the vague term "river behaviour" to be replaced with a more precise and useful set of terms that correctly reflect physical processes and risks. Consider this a work in progress but let's start with these: "hydropeaking" a widely used term that describes the hydrological changes between a natural river's behaviour and one that is controlled for flood control and or electrical generation. "Channel incision" this term accurately describes the deepening of a river's channel as result of ongoing erosion, hydropeaking effects, and the elimination of restorative sediment inputs from upstream. It is useful to help understand the effects on water tables adjacent the river and how these put various resource values at risk. "Stream-bank erosion", a distinct and different process than incision (they have an interesting relationship) which is best used to link erosion losses of riparian vegetation and the permanent loos of fine grained sediments to a physical process which is relatively easy to understand.	The term river behaviour will be replaced with "fluvial geomorphology"; other terms used in the assessments (such as those noted in the comment) will be described in the REV 6 Hydrotechnical and Geophysical EA reporting.		The term river behaviour will be replaced with "fluvial geomorphology"; other terms used in the assessments (such as those noted in the comment) will be described in the REV 6 Hydrotechnical and Geophysical EA reporting. See Section 4.1 of the dAIR

REV6 Comments Tracking Table
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NO	DATE	COMMENTS ORIGINATED		Topic Subject	Comments	RESPONSE	If unsatisfactory - Comments	Responses
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CC-FM-12	2015, January	Francis Maltby			Choose a better metric than "mean river velocity". I wish to suggest that the selection of the metric chosen to measure a range of impacts due to river behaviour suffers the same short comings as the 14 day metric does. The metric chosen is "mean river velocity". This is perhaps the least useful metric to accurately determine the effects of hydropeaking operations on channel incision and or stream-bank erosion. What initiates erosion is the velocity of water relative to the particle size subject to being moved that suggests that the maximum velocity would have the greatest ability to erode? Over what period will mean river velocity be measured? Hourly, over an entire day, a week or a month. The longer the period measured the greater the difference between mean and maximum velocity will be, the less useful the metric becomes. Interesting to note that maximum velocity typically occurs during the time that water level is rising not when the water level is at its highest level. Mean river velocity completely ignores the fact that there are multiple daily cycles when the water goes up and down in the river channel, each of these cycles initiating another series of erosion events. The number of	BC Hydro will examine maximum velocity at high flows, maximum velocities associated with peaking flows, changes in velocity over peaking cycle.		BC Hydro will examine maximum velocity at high flows, maximum velocities associated with peaking flows, changes in velocity over peaking cycle. See Section 4.1 of the dAIR
CC-FM-2	2015, January	Francis Maltby		EA Process	"How do we avoid the built in bias of this process and the Regulatory environment which will lead to more "acceptable" environmental losses and damage? The process guides us into acceptance of the only the "current" state of our knowledge, it guides us to accept that what "society deems important", as defined by professionals, only species currently "listed as threatened or endangered". Do we accept this, can we?"	BC Hydro is undertaking an assessment process that takes into account all perspectives, rather than those of just professionals. BC Hydro is seeking input on VCs, methodologies, effects, and mitigation. The process is intended to be as open as possible, with transparency around technical issues and information. Improvements are continuously being made in the practice of environmental assessment with a recognition that it is intended to balance of wide range of issues and interests. The final decisions resides with EAO.		
CC-FM-3	2015, January	Francis Maltby		Ecological Communities	"Riparian vegetation loss "as a result of erosion and or flooding". Riparian has been identified but I would like to have both mechanisms, they are different, formally recognized."	The potential effects to vegetation communities (including riparian loss) will include factors such as erosion and flooding. These mechanisms have been considered in previous work (e.g., CLBMON 12, 33 and CLBWORKS 35, 36) and these will be further considered in the assessment of effects.		The potential effects to vegetation communities (including riparian loss) will include factors such as erosion and flooding. These mechanisms have been considered in previous work (e.g., CLBMON 12, 33 and CLBWORKS 35, 36) and these will be further considered in the assessment of effects. See Section 4.5 of the dAIR.
CC-FM-4	2015, January	Francis Maltby		Geophysical	"The Big Eddy side channel. This is the only remaining large river feature of its type on the main stem Columbia between Donald BC and the Hugh Keenlyside dam at Castlegar (about 400 kms?), which has most of the natural attributes: shrubs, trees, herbs, off-channel hydrology. Certainly that is a Value?"	BC Hydro is assessing the effects of the Project on sensitive ecosystems and we will evaluate the potential interactions of the Project on Big Eddy Side Channel. The feature is part of the 2D modelling, so some metrics such as frequency of wetting, flow rates and velocities will be available for assessment.		Section 4.3 Ecological Communities
CC-FM-5	2015, January	Francis Maltby		Geophysical	"The Columbia River nesting islands. Full disclosure these are near my home and there are no listed species I know of in the equation. However, each morning I go to work in right now I can hear the goings on, I, other neighbourhood residents, and visitors to this community can walk to the edge of the river bank and observe a small part of the natural history of this place. That is a Valued Component?"	BC Hydro is assessing the effects of the Project on sensitive ecosystems and we will evaluate the potential interactions of the Project on the MCR Nesting Islands and determine if it meets the criteria for the candidate VC or sub-component. The islands will be incorporated into the bathymetric and sediment surveys so assessment of erosion potential, bar migration can be made.		Section 4.3 Ecological Communities and 4.6 Birds
CC-FM-6	2015, January	Francis Maltby		Erosion Add: Changes to rates of erosion as the indicator for above effects on geophysical features Big Eddie and MCR Nesting Islands	"I believe there is nothing that can be done to prevent the loss of these islands. I have watched them for over thirty years and slowly, slowly they are being lost to the river. What has changed and it has been dramatic is the rate of loss. I have observed a dramatic acceleration of the erosion rate with the commissioning of Revelstoke Unit 5. I believe that the rate of loss will further accelerate once Unit 6 comes into operation. The worst of it is that this and other changes are occurring without "scientific" detection. Does a lack of detection become part of the lie that there is no harm being done?"	BC Hydro will be assessing the effects of erosion and flooding on sensitive ecosystems.		BC Hydro will be assessing the effects of erosion on sensitive ecosystems as per Section 4.3 Ecological Communities of the dAIR.
CC-FM-7	2015, January	Francis Maltby		Ecological Communities	Northwest Airport Marshes, the close proximity of these marshes to the Columbia River may put them at risk to seasonal drainage and other hydrological impacts if incision is occurring in the Columbia River channel. This is due to normal linkages that would exist between the river water levels and ground water for these floodplain areas.	Acknowledged. Mechanisms that could lead to changes in ecological communities will be part of the assessment.		Acknowledged. Mechanisms that could lead to changes in ecological communities will be part of the assessment. See Sections 4.1.2 (Hydrology) and 4.1.3 (Fluvial Geomorphology) of the dAIR.

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CC-FM-8	2015, January	Francis Maltby		Ecological Communities, Sensitive Ecosystems	Key areas of concern and interest to me: Locke Creek, Downie Marsh, Cartier Marsh have been identified what remains to be seen is how the risk to these areas will be dealt with.	Acknowledged. Technical sub-groups will explore approaches for assessing the potential effects.		
CC-FM-9	2015, January	Francis Maltby		Ecological Communities, Sensitive Ecosystems	"I again wish to object to the inclusion of the main Airport Marsh, east of the runway, in this process. This marsh has high value because it is in the upper elevation of the Arrow Reservoir, the reservoir normally flood to about 440m asl, APM is at about 438.5 m. asl. It is in a very broad portion of the flood plain and the effects of hydropeaking on it will be almost negligible, it is not at risk. My fear is that it will be used as a mechanism to low-ball both the value of other wetland habitats and the impacts on them. It is not affected by the Revelstoke Dam, unit 6 or otherwise so why is it still in this process?"	The assessment will include the potential for effects of the Project on all vegetation communities within the defined study area. This study area – specific to the MCR - is selected to include areas that are affected by current operations and are therefore subject to additional change with the 6th generation unit. The hydrology model will help inform potential effects within the study area. Potential effects will be considered additively rather than averaged, so that any areas predicted to experience lesser effects will not negate consideration of other effects on other areas.		
CC-JL-1	2015, January	Jody Lownds		Other	The North Columbia Environmental Society would like to see the Table of Commitments made as a result of the Rev 5 process to be worked into forming an "Associated Sub-Component" or an "Indicator" where they relate to a Proposed VC. For example, if there were commitments/mitigation work to be done that came out of the Rev 5 process that relate to Fish Resources, then the below additions could be made to the table at pg. 33: o Associated Sub-Component (SC): Track record of upholding prior commitments relating to this VC o Indicators: - Status/progress/completion of Study XYZ - Status/progress/completion of Mitigation Works XYZ	For each Rev 6 VC or sub-component, results of BC Hydro's compliance with previous project EAC commitments, if applicable, will be reviewed. The information available from any related monitoring and mitigation efforts will be described as part of the existing conditions, and where relevant, inform methodology and proposed mitigation. Note: The detailed Rev 5, Mica 5, and Mica 6 EAC commitment compliance reports filed by BC Hydro are available at the Environmental Assessment Office website.		
CC-JL-2	2015, January	Jody Lownds		Other	The above should be done for every Rev 5 commitment that can reasonably be linked to one of the proposed VCs in the draft document, namely: o Fish Resources o Ecological Communities o Plants o Herptiles o Birds o Mammals o Economy o Socio-Community o Land and Resource Use o Heritage and Archaeology o Human Health	Agreed, as above.		
CC-JL-3	2015, January	Jody Lownds		Other	Alternatively, "Proponent track record with successful mitigation and meeting commitments from past similar projects" should form some kind of Valued Component (though I suspect the above approach will be more workable).	Agreed as above.		
CC-JL-4	2015, January	Jody Lownds		Assessment Methodology	AIR: The NCES takes issue with the way Cumulative Effects are presented/defined in section 4.10 of the document (at pg. 25) as follows: o Cumulative effects assessment should not only be done if "residual" effects are expected o Operational effects of Mica units 1-6; Revelstoke units 1-5 and Hugh Keenleyside shouldn't be incorporated into the "baseline". Baseline should mean baseline.	BC Hydro will conduct a cumulative effects assessment in accordance with the Environmental Assessment Office's User Guide.		BC Hydro will conduct a cumulative effects assessment in accordance with the Environmental Assessment Office's User Guide. See Section 3.10 of the dAIR.
CC-RP-1	2015, January	Randy Priest		Wildlife/Plants	Listed Species: A number of VC's mention the need to address listed species. How can this be in that any responsibility of the licensee is only in the flooded areas? Any wildlife or plant life within the drawdown zone has come about despite the reservoir and usage. Hence how can there be any assurance that future flooding might not place the species at harm?	Listed species are considered for a number of VCs as those populations are most sensitive to change as they are limited by geography and/ or abundance. However, species and ecosystems not listed are also considered - especially those that are sensitive to additional disturbance related to the Project.		Listed species and non-listed species within the LSA/RSA are considered for a number of VCs as those populations are most sensitive to change as they are limited by geography and/ or abundance.
CC-RP-2	2015, January	Randy Priest		Wildlife/Plants	Reference to traditional knowledge considering the above comments should then only be above the licensed operating levels, (excluding identified arch sites).	Environmental effects, including those related to Traditional Knowledge, will be assessed where there is a project impact.		
CC-RP-3	2015, January	Randy Priest		Plants	Reed Canary Grass has become a major plant species within the drawdown zone, what is the impact of this invasive species on any wildlife or plant life within the reservoir. There should be consideration given to developing a study of the overall influence and impact of this grass throughout the entire reservoir. Should be adequate strength with this issue to have it identified as a cumulative effect? Outcomes from this study will directly impact any other plant or wildlife based concerns or studies because of the Reed Canary Grass negative effect to other species.	The extent of anthropogenic influence (reservoirs, revegetation programs) will be discussed as it has shaped the existing conditions within the study area. This will be part of the discussion of effects in both the Local Study Area (LSA) and RSA.		The extent of anthropogenic influence (reservoirs, revegetation programs) will be discussed as it has shaped the existing conditions within the study area. This will be part of the discussion of effects in both the Local Study Area (LSA) and RSA. Section 4.4 of the dAIR outlines the requirements for existing conditions.

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CC-RP-4	2015, January	Randy Priest		Plants	What is the survival rate of sedges planted as an outcome of the COL WUP because of high reservoir levels and invasive species competition?	The exisiting conditions of Ecological Communities is discussed in the assessment and includes the present state of habitat types within the study area.		The exisiting conditions of Ecological Communities is discussed in the assessment and includes the present state of habitat types within the study area. See Section 4.3 of the dAIR.
CC-RP-5	2015, January	Randy Priest		Fish	A number of fish related studies have been conducted in the Mid Columbia from various WUP's. What has been the impact of changing populations of other fish species/invasive species on the success of these efforts or general health of native fish species?	BC Hydro's Water Use Plan (WUP) studies on fish in the Mid Columbia Reach (MCR) have been reviewed for information relevant to each Rev 6 VC or sub-component, and the information incorporated into the EA. The information available from any related monitoring and mitigation efforts will be described as part of the existing conditions, and where relevant, inform methodology and proposed mitigation. All WUP study reports are posted once available on the BC Hydro Southern Interior Water Use Planning website.		BC Hydro's Water Use Plan (WUP) studies on fish in the Mid Columbia Reach (MCR) have been reviewed for information relevant to each Rev 6 VC or sub-component, and the information incorporated into the EA. The information available from any related monitoring and mitigation efforts will be described as part of the existing conditions, and where relevant, inform methodology and proposed mitigation. All WUP study reports are posted once available on the BC Hydro Southern Interior Water Use Planning website. WUP Study references are provided in Section 16 of the dAIR.
CC-RP-6	2015, January	Randy Priest		Hydrogeological and Geophysical	The annual reservoir curves for the Arrow result in longer periods of time that the reservoir levels during refill, summer operation and winter draw down are in and around 1420 ft. At these levels what erosion events in Revelstoke Reach will be repetitively occurring as the station cycles from 20 to 90,000CFM up to twice per day?	The effects of reservoir operations on erosion in Revelstoke Reach are discussed as part of the Hydrology and Fluvial Geomorphology Intermediate Component in the EACA		The effects of reservoir operations on erosion in Revelstoke Reach are discussed as part of the Hydrology and Fluvial Geomorphology Intermediate Component in Sections 4.1.2 and 4.1.3 of the Application, and in Section 4.1 of the dAIR.
CC-RP-7	2015, January	Randy Priest		Hydrogeological and Geophysical	The Rev 5 assessment indicates very little erosion occurring directly below the dam and upstream of the bridge. Two events might be looked at; erosion on east bank downstream of the golf course during normal operations, erosion again when the reservoir is at full pool and full station operation, (it is unrealistic to evaluate the river at this point as being the same elevation across the entire width, natural flow and swirling will pile water higher against the east bank).	Simulated Revelstoke Dam discharges and spills, potential operational effects on hydrology, and incremental changes in bank erosion associated with the Project will be assessed in Section 4.1.1 of the EA.		Simulated Revelstoke Dam discharges and spills, potential operational effects on hydrology, and incremental changes in bank erosion associated with the Project will be assessed. Refer to Section 4.1 of the dAIR.
CC-RP-8	2015, January	Randy Priest		Hydrogeological and Geophysical	Hydro operation forecasts seem to much too conservative in respect to projected operations, a set of river flows from low reservoir levels to max pool levels should be completed for river bed stress, erosion projections and calculated with the station operating at maximum output for a period of several days. (One must consider abnormal operations occurring over the operating life of the facility).	modelling to be completed over the full range of operating conditions expected with REV6 (Dave/Barry)		modelling to be completed over the full range of operating conditions expected with REV6. Refer to Section 4.1 of the dAIR.
CC-RP-9	2015, January	Randy Priest		Hydrogeological and Geophysical	What were pre dam river levels in this area at 90,000cfm and then river levels at flood event flows. (Much of the above information is available from the Rev 5 Assessment Report but might want to be restated considering changes made to the Big Eddy for flood control and the addition of the three bridges).	The extent of anthropogenic influence (reservoirs, revegetation programs) will be discussed on both the Local Study Area (LSA) (Local Study Area (LSA)) and Regional Study Area (RSA) levels. Hydrology and Fluvial Geomorphology related to the Project will be assessed in Section 4.1.1 of the EA.		The extent of anthropogenic influence (reservoirs, revegetation programs) will be discussed on both the Local Study Area (LSA) and Regional Study Area (RSA) levels. Hydrology and Fluvial Geomorphology requirements are outlined in Section 4.1 of the dAIR. .
CC-WW-1	2015, January	Warren Ward		Fish	Fish Resources: Review REV #5 and WUP studies	Yes, we have reviewed pertintent REV5 and WLR studies for baseline information.		Yes, we have reviewed pertintent REV5 and WLR studies for baseline information. See Section 16 of the dAIR
CC-WW-10	2015, January	Warren Ward		Heritage & Archaeology	Heritage & Archaeology - Rev #5 & WUP Studies	Applicable information included in the Rev.5 study (i.e., Choquette's 1994 Heritage Resources Impact Study of the BC Hydro Revelstoke Unit 5 Project), WUP Studies, and WUP Addendum studies (including any relevant ones related to soft constraints) have been reviewed for baseline information.		Applicable information included in the Rev.5 study (i.e., Choquette's 1994 Heritage Resources Impact Study of the BC Hydro Revelstoke Unit 5 Project), WUP Studies, and WUP Addendum studies (including any relevant ones related to soft constraints) have been reviewed for baseline information. See Section 16 of the dAIR
CC-WW-11	2015, January	Warren Ward		Human Health	Human Health - Rev #5 & WUP Studies	There are no applicable Rev 5 studies. A WUP study on dust control in the Arrow is available.		There are no applicable Rev 5 studies. A WUP study on dust control in the Arrow is available.
CC-WW-12	2015, January	Warren Ward		Other	Soils - Rev #5 & WUP Studies	Applicable references related to the Intermediate Components (soils, noise, hydrology and river behavior, and traffic) from the Revelstoke Unit 5 Environmental Assessment and Water Use Planning studies have been reviewed to inform the REV6 EA. There is at least one study related to Veg and Soils analysis referenced in the REV5 Application.		
CC-WW-13	2015, January	Warren Ward		Other	Noise - Rev #5 & WUP Studies	Applicable references related to the Intermediate Components (soils, noise, hydrology and river behavior, and traffic) from the Revelstoke Unit 5 Environmental Assessment and Water Use Planning studies have been reviewed to inform the REV6 EA.		Applicable references related to the Intermediate Components (soils, noise, hydrology and river behavior, and traffic) from the Revelstoke Unit 5 Environmental Assessment and Water Use Planning studies have been reviewed to inform the REV6 EA.
CC-WW-14	2015, January	Warren Ward		Other	Hydrology and River Behaviour	Applicable references related to the Intermediate Components (soils, noise, hydrology and river behavior, and traffic) from the Revelstoke Unit 5 Environmental Assessment and Water Use Planning studies have been reviewed to inform the REV6 EA.		

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CC-WW-15	2015, January	Warren Ward		Hydrogeological and Geophysical	Monitor discharge flows and velocities and duration of event, from the Dam to where the water enters the Arrow Reservoir at the different elevations and time of year. -Monitoring the scouring of the river bed and the erosion of the river bank. -I do not think that the planting of sedges has prevented the eroding of the banks. -We should be prepared to RIP-WRAP sections of the river with large heavy rock and certain sections of the river bed. -We should have a warning system in place when the Dam discharges water flow.	• BC Hydro continuously monitors turbine discharge and spill discharge at the plant. Water levels downstream of REV dam are monitored at 6 (six) locations as part of the WUP CLBMON15a studies and for operational purposes in Arrow Reservoir at 2 locations (Nakusp, Fauquier). Additionally, ten (10) monitoring stations have recently been added along the MCR to monitor water level fluctuations in wetland and backchannel areas. A 2D hydraulic model has been developed to calculate channel velocities and water levels along the MCR for varying operations/seasonal scenarios. • Bed substrate and bank material surveys have been conducted to evaluate erosion potential with REV6 operations, in conjunction with the 2D model output. River bank erosion is currently being monitored at 15 locations along the MCR from near the Jordan River downstream to Shelter Bay as part of the WUP CLBWORKS #35/#36 studies. • willows and other plants were used in bioengineering trials, and was assessed &		• BC Hydro continuously monitors turbine discharge and spill discharge at the plant. Water levels downstream of REV dam are monitored at 6 (six) locations as part of the WUP CLBMON15a studies and for operational purposes in Arrow Reservoir at 2 locations (Nakusp, Fauquier). Additionally, ten (10) monitoring stations have recently been added along the MCR to monitor water level fluctuations in wetland and backchannel areas. A 2D hydraulic model has been developed to calculate channel velocities and water levels along the MCR for varying operations/seasonal scenarios. • Bed substrate and bank material surveys have been conducted to evaluate erosion potential with REV6 operations, in conjunction with the 2D model output. River bank erosion is currently being monitored at 15 locations along the MCR from near the Jordan River downstream to
CC-WW-16	2015, January	Warren Ward		Hydrogeological and Geophysical	Questions: What was the original Columbia Flow at Revelstoke, before the Dam was built? Cubic feet per second and elevation? How do we get the information that is given to the B.C. Environmental Board from the Fish & Wildlife Consultive Committees, Public and Aboriginal groups?	Where it is relevant to the assessment of a VC, in the existing conditions description BC Hydro includes a qualitative description of known conditions prior to the dam. However, incremental effects of Rev 6 will be measured from the Rev 5 baseline. The Intermediate Component "Hydrology and River Behaviour" will be assessed for incremental effects with indicators such as water levels, velocity, and erosion. (see Table 4 – Proposed Methods for Data Collection, line "Hydrology and River Behaviour" at page 42 of the dVC Document). The information referred to in the question will be available through the BC Hydro Fish and Wildlife Compensation Programs (FWCP) websites. General FWCP website, https://www.BC Hydroydro.com/about/sustainability/environmental_responsibility/compensation_programs.html?WT.mc_id=rd_bcrp		
CC-WW-2	2015, January	Warren Ward		Ecological	Ecological Communities: Review REV #5 and WUP studies. Airport Marsh, Lock Creek, Downie Marsh and Carter Marsh. They were formed from the flooding of the Arrow Reservoir and will always be subject to the changing Water Reservoir	Yes, we have reviewed pertintent REV5 and WLR studies for baseline information.		Yes, we have reviewed pertintent REV5 and WLR studies for baseline information. See Section 16 of the dAIR
CC-WW-3	2015, January	Warren Ward		Plants	Plants: Review REV #5 and WUP studies. Reed Canary Grass has become a major plant species in the draw down zone. The survival rate of the planted sedges, is low. We need to let the Reed Canary Grass take over.	Yes, we have reviewed pertintent REV5 and WLR studies for baseline information. Existing vegetation communities (including those that contain reed canary grass) will be described in the assessment. The response of these communities to potential hydrological changes will be part of the assessment		Yes, we have reviewed pertintent REV5 and WLR studies for baseline information. Existing vegetation communities (including those that contain reed canary grass) will be described in the assessment. The response of these communities to potential hydrological changes will be part of the assessment. See Section 16 of the dAIR
CC-WW-4	2015, January	Warren Ward		Herptiles	Herptiles: review REV #5 and WUP studies. They are all subject to changing water levels in the Arrow Lake water levels. Review the soft constraints for the Arrow Reservoir, as they were developed to compensate for each of the different value components.	Yes, we have reviewed pertintent REV5 and WLR studies for baseline information. There are no applicable Rev 5 studies, but applicable WUP and WUP Addendum Studies (including those related to soft constraints) will be reviewed for baseline information. See CLBMON 37, 38, 11B3		Yes, we have reviewed pertintent REV5 and WLR studies for baseline information. There are no applicable Rev 5 studies, but applicable WUP and WUP Addendum Studies (including those related to soft constraints) will be reviewed for baseline information. See CLBMON 37, 38, 11B3. See Section 16 of the dAIR
CC-WW-5	2015, January	Warren Ward		Birds	Birds: review REV #5 and WUP studies. They are all subject to changing water levels in the Arrow Lake water levels. Review the soft constraints for the Arrow Reservoir, as they were developed to compensate for each of the different value components.	Acknowledged. Applicable studies (including those related to soft constraints) have been reviewed for baseline information (e.g., CLBMON36 and 39)		Acknowledged. Applicable studies (including those related to soft constraints) have been reviewed for baseline information (e.g., CLBMON36 and 39). See Section 16 of the dAIR
CC-WW-6	2015, January	Warren Ward		Mammals	Mammals: review REV #5 and WUP studies. They are all subject to changing water levels in the Arrow Lake water levels. Review the soft constraints for the Arrow Reservoir, as they were developed to compensate for each of the different value components.	Acknowledged. Applicable studies (including those related to soft constraints) have been reviewed for baseline information (e.g., CLBMON 11B1).		Acknowledged. Applicable studies (including those related to soft constraints) have been reviewed for baseline information (e.g., CLBMON 11B1). See Section 16 of the dAIR
CC-WW-7	2015, January	Warren Ward		Economic	Economy - Rev #5 & WUP Studies	Yes, we have reviewed pertintent REV5, Mica 5/6 and WLR studies for baseline information.		Yes, we have reviewed pertintent REV5, Mica 5/6 and WLR studies for baseline information. See Section 16 of the dAIR
CC-WW-8	2015, January	Warren Ward		Social	Socio/Community - Rev #5 & WUP Studies	Yes, we have reviewed pertintent REV5 and WLR studies for baseline information.		Yes, we have reviewed pertintent REV5 and WLR studies for baseline information. See Section 16 of the dAIR
CC-WW-9	2015, January	Warren Ward		Land & Resource	Land & Resource Use - Rev #5 & WUP Studies	Yes, we have reviewed pertintent REV5 and WLR studies for baseline information.		Yes, we have reviewed pertintent REV5 and WLR studies for baseline information. See Section 16 of the dAIR

REV6 Comments Tracking Table
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NO	DATE	COMMENTS ORIGINATED		Topic Subject	Comments	RESPONSE	If unsatisfactory - Comments	Responses
		Name	Affiliation			What		
FN-KNC-1	2015, January		Ktunaxa Nation Council	Other	At this time, the Ktunaxa Nation Council (KNC) are happy to see the inclusion of a Valued Component (VC) for impacts to indigenous governance and planning, and we are encouraged by inclusion of an indicator related to First Nation information for each of the biophysical VCs, but overall, the approach and requirements for including and assessing impacts to Ktunaxa rights and interests are unclear. We suggest that further discussion on three issues in particular may be useful: • We are unsure how the indicator of "information provided by First Nations communities or First Nations coordinators" will be implemented; • We want to highlight the opportunity provided by understanding the predicted vs. real effects related to installation of the recent near correlate of the Revelstoke 5 generator; and • We also want to highlight the importance of providing, as near as reasonable, a sense of the pre-disturbance (pre-Revelstoke Dam) environments in order to understand trends that have already occurred or are occurring, and to support reclamation and management of riparian and aquatic environments to re-establish similar ecosystems through operations	See below FN-KNC-1a, FN-KNC-1b & FN-KNC-1c		
FN-KNC-10	2015, January		Ktunaxa Nation Council	Selection of Valued Components	• A subcomponent should be added for 'anadromous salmon restoration potential'. Indicators should include: water temperatures, spawning and incubation habitat availability (for chinook and sockeye), and passage restoration feasibility. • In addition to relative abundance and biomass, condition, size and age distribution are important indicators. Condition is one indicator of fish health; size distribution is an indicator of growth rate and prey availability; age distribution is an indicator of the resilience of the population. • Additional habitat indicators are water depth and velocity (important for sturgeon spawning and incubation and for bull trout habitat selection) • For bull trout, entrainment should also be an indicator • Similar comments for 'Commercial, aboriginal and recreational fisheries' subcomponent with respect to population and habitat indicators • Fish harvest should also be included as an indicator for both listed and other (CAR) fish species, separated into aboriginal (FN) harvest and recreational harvest.	This interest is acknowledged; however, anadromous salmon are not included in the scope of the EA. Revelstoke Unit 6 project activities and operations will not preclude the ongoing potential for future fish passage or fish resource use of concern to First Nations. The Canadian Columbia River Intertribal Fisheries Commission (CCRIFC) has proposed the formation of a multiagency committee to start investigating the feasibility of salmon restoration in the Columbia. BC Hydro has agreed to participate in such a committee should it proceed Agreed that metrics of condition, size and age can be evaluated where data exist. Water depth and velocity will be part of the assessment using both the 2d model and the 3d modelling results from the sturgeon study. Entrainment risk screening for Revelstoke GS focussed on kokanee as the species most at risk and Entrainment Strategy focussed effort on kokanee. Information pertaining to sports Fishery is provided in the Assessment. Fish harvest		A venue for discussion of salmon and other broader issues will be through BCH/First Nations Relationship Agreements. This interest is acknowledged; however, anadromous salmon are not included in the scope of the EA. Revelstoke Unit 6 project activities and operations will not preclude the ongoing potential for future fish passage or fish resource use of concern to First Nations. The Canadian Columbia River Intertribal Fisheries Commission (CCRIFC) has proposed the formation of a multiagency committee to start investigating the feasibility of salmon restoration in the Columbia. BC Hydro has agreed to participate in such a committee should it proceed Agreed that metrics of condition, size and age can be evaluated where data exist. Water depth and velocity will be part of the assessment using both the 2d model and the 3d
FN-KNC-11	2015, January		Ktunaxa Nation Council	Selection of Valued Components	• Re provincially listed ecosystems: should also include species composition and vegetation structure within listed ecosystems/communities as an indicator • Re provincially listed ecosystems, should also include inundation frequency, depth, duration, and seasonality as habitat indicators • Same two comments for sensitive ecosystems • Re ecosystem health and function for biodiversity: Should read as an indicator description as follows: "Spatial extent, composition and structure of all ecosystems and habitats, including associated vegetation assemblages and wildlife."	Since the Draw Down Zone (DDZ) portion of the Local Study Area (LSA) (Local Study Area (LSA)) is heavily influenced by the operations of the Arrow Lakes Reservoir and revegetation programs, the vegetation communities present in the Draw Down Zone (DDZ) are not representative of any of the provincially-listed ecological communities at risk. As such, inundation frequency, depth, and duration are not relevant. Within Section 4.3 sensitive ecosystems have been defined for the assessment as wetlands, old-growth forest, and riparian areas. Section 4.3 provides information on sensitive ecosystems including: the size, location, and descriptions of the larger wetland complexes explicitly identified by members of the Core Committee; descriptions of the vegetation communities (riparian) found within the Draw Down Zone (DDZ) – including amount and distribution within elevation bands; and extent of old-growth forest within the Local Study Area (LSA) (with		Since the Draw Down Zone (DDZ) portion of the Local Study Area (LSA) is heavily influenced by the operations of the Arrow Lakes Reservoir and revegetation programs, the vegetation communities present in the Draw Down Zone (DDZ) are not representative of any of the provincially-listed ecological communities at risk. As such, inundation frequency, depth, and duration are not relevant. The indicators are listed in Table 2 Section 3.1 of the dAIR. Within Section 4.3 of the EA, sensitive ecosystems have been defined for the assessment as wetlands, old-growth forest, and riparian areas. Section 4.3 of the EA provides information on sensitive ecosystems including: the size, location, and descriptions of the larger wetland complexes explicitly identified by members of the Core Committee;
FN-KNC-12	2015, January		Ktunaxa Nation Council	Selection of Valued Components	Re federal or provincial listed species: first indicator should read "abundance and distribution of known occurrences of listed species". Note that "presence of suitable habitat" for listed plants is not a valid indicator based on site series modeling because rare plant occurrence is poorly correlated with site series and rare plants are often associated with microhabitat conditions that are hard to predict. These characteristics cannot be modeled according to provincial experts (J. Penny, Botanist, CDC and D. MacKillop, Regional Ecologist, FLNRO); therefore a field verification step would need to be performed to determine the proportion of polygons that actually support rare plants. Second indicator should read "abundance, distribution and quality of suitable habitat for listed species (based on verification)".	Acknowledged. We will review existing information from available studies (e.g., CLBMON 12, 33) to address abundance and distribution of known occurrences of listed plant species. Suitable habitat for listed species will consider the present quality of habitat within the study areas. A rare plant assessment was specifically completed at the capacitor station as part of the field studies in 2014 and rare plant occurrences have been doscumented as a result of ongoing vegetation work related to WUP studies.		Acknowledged. We will review existing information from available studies (e.g., CLBMON 12, 33) to address abundance and distribution of known occurrences of listed plant species. Suitable habitat for listed species will consider the present quality of habitat within the study areas. A rare plant assessment was specifically completed at the capacitor station as part of the field studies in 2014 and rare plant occurrences have been doscumented as a result of ongoing vegetation work related to WUP studies. A list of indicators is provided in Table 2, Section 3.1 of the dAIR.

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FN-KNC-13	2015, January		Ktunaxa Nation Council	Selection of Valued Components	• Re federal or provincial listed species: first indicator should read "abundance and distribution of known occurrences of listed species". Second indicator should read ""abundance, distribution and quality of suitable habitat for listed species". • Re migratory birds: first indicator should read "abundance, distribution and diversity of migratory bird species". • Re raptors: first indicator should read "abundance, distribution and diversity of raptor species" • Include as a guild cavity nesting birds: first indicator should read "abundance, distribution and diversity of cavity-nesting bird species"; second indicator would be "abundance, distribution and quality of suitable habitat (i.e., wildlife trees) for cavity-nesting bird species".	Acknowledged. We will review existing information from the WUP studies (e.g., CLBMON 36, 39, 40) to address abundance and distribution of known occurrences of listed and migratory bird and raptor species, as well as the abundance, distribution and quality of known suitable habitat for listed and migratory bird and raptor species. Migratory birds and raptors will include cavity nesting species.		Acknowledged. We will review existing information from available studies (e.g., CLBMON 12, 33) to address abundance and distribution of known occurrences of listed plant species. Suitable habitat for listed species will consider the present quality of habitat within the study areas. A rare plant assessment was specifically completed at the capacitor station as part of the field studies in 2014 and rare plant occurrences have been doscumented as a result of ongoing vegetation work related to WUP studies. A list of indicators is provided in Table 2, Section 3.1 of the dAIR. VC document was not modified, however, the assessment of the Bird VC considered the known or expected occurrence of listed species and raptors; the presence, quality and quantity of suitable habitat for listed species, and; the abundance, distribution, and diversity of migratory birds. Section 4.6 Birds
FN-KNC-14	2015, January		Ktunaxa Nation Council	Selection of Valued Components	• Re federal or provincial listed species: first indicator should read "abundance and distribution of known occurrences of listed species". Second indicator should read "abundance, distribution and quality of suitable habitat for listed species".	We will review existing information from the WUP studies (e.g., CLBMON 11B3, 37) to address abundance and distribution of known occurrences of listed herptile species, as well as the abundance, distribution and quality of known suitable habitat for listed herptile species.		VC document was not modified; however, the assessment of the Herptile VC considered the occurrence, abundance and distribution of herptile species per Section 4.5 Herptiles of the dAIR. We will review existing information from the WUP studies (e.g., CLBMON 11B3, 37) to address abundance and distribution of known occurrences of listed herptile species, as well as the abundance, distribution and quality of known suitable habitat for listed herptile species. Indicators are listed in Table 2, Section 3.1 in the dAIR.
FN-KNC-15	2015, January		Ktunaxa Nation Council	Selection of Valued Components	• Re federal or provincial listed species: first indicator should read "abundance and distribution of known occurrences of listed species". Second indicator should read ""abundance, distribution and quality of suitable habitat for listed species". • Re ungulates: first indicator should read "abundance, distribution and diversity of ungulate species and their movement corridors". Second should read "abundance, distribution and quality of winter range habitat" Re mammals: • Furbearers should be included as a sub-component, with an associated first indicator of abundance, distribution and diversity of furbearer species'. Second indicator should read "abundance, distribution and quality of habitat".	We will review existing information from the WUP studies (e.g., CLBMON 11B1) and publicly available government data to address abundance and distribution of known occurrences of listed mammal/ungulate species, as well as the abundance, distribution and quality of known suitable habitat for listed mammal/ungulate species. Furbearer are included in the Mammals VC and have been included in Section 4.7 of the assessment. The following wording has been included in the assessment under the sub-component Traditional Use and Knowledge: "Furbearers have been identified as species of cultural or economic importance to First Nations"		VC document was not modified, however, we will review existing information from the WUP studies (e.g., CLBMON 11B1) and publicly available government data to address abundance and distribution of known occurrences of listed mammal/ungulate species, as well as the abundance, distribution and quality of known suitable habitat for listed mammal/ungulate species. Furbearer are included in the Mammals VC and have been included in Section 4.7 of the assessment. The following wording has been included in the assessment under the sub-component Traditional Use and Knowledge: "Furbearers have been identified as species of cultural or economic importance to First Nations" Indicators are listed in Table 2, Section 3.1 of the dAIR. Within the Mammals Section (Section 4.7) the sub-components
FN-KNC-16	2015, January		Ktunaxa Nation Council	Selection of Valued Components	Should add a sub-component re: "First Nations harvesting and other uses" including consideration of where First Nations activities 'took place, take place, or are likely to take place in the foreseeable future', alternately, please specify which VC or VCs will clearly address past, present, and planned First Nation use of lands	This information will be included in Part C.		
FN-KNC-17	2015, January		Ktunaxa Nation Council	Selection of Valued Components	Should add a sub-component re: "Availability of country foods for healthy diets and food security". The Ktunaxa would prefer to see a VC for healthy diet and food security in Section 15.	This information will be included in Part C.		

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FN-KNC-18	2015, January		Ktunaxa Nation Council	Selection of Valued Components	• Under many of the SCs associated with Ktunaxa rights and interests, the proponent has stated, "Information provided by First Nations communities or First Nations coordinators". This statement should be clarified. Does this mean that the proponent will use indicators specified by First Nations for the assessment, or rely on an assessment conducted by First Nations communities or coordinators? • Please add confirmation that, in addition to VCs listed in table 4.1, other VCs identified by the Ktunaxa Nation or other First Nations or Aboriginal communities, and included in section 15 (Aboriginal rights) and section 16 (Aboriginal interests) will be considered fully as valued components, and will be assessed based on appropriate standards comparable to those required for VCs in table 4.1. • Under associated subcomponents, the proponent should list all subcomponents that will be considered; without a full list, it is difficult to know if there are gaps. • Consider adding soil/slope stability as a VC particularly with regards to erosion upstream or downstream of facilities due to increased variability in flow management	Information and value components provided by First Nations have been considered in Part B. The Heritage and Archaeology candidate VC has been split into 'First Nations Cultural Heritage' and 'Historical and Archaeological Heritage'. 'First Nations Cultural Heritage' section will be assessed by First Nations in Part C of the Application. Further information specific to Aboriginal Rights and Interests will be included in Part C. While Table 4.1 of the dAIR provides a summary of sub-components, please refer to the Assessment for a full list of sub-components. Potential for Project related shoreline erosion is included as an Indicator in assessment of the Hydrology and Fluvial Geomorphology VC.		First Nations participated in the process to select VCs and indicators. Information provided by FNs will be used to assess indicators. Information and value components provided by First Nations have been considered in Part B. The Heritage and Archaeology candidate VC has been split into 'First Nations Cultural Heritage' and 'Historical and Archaeological Heritage'. 'First Nations Cultural Heritage' section will be assessed by First Nations in Part C of the Application. Further information specific to Aboriginal Rights and Interests will be included in Part C. While Table 2 in Section 3.1 of the dAIR provides a summary of sub-components, please refer to the Assessment for a full list of sub-components.
FN-KNC-19	2015, January		Ktunaxa Nation Council	Selection of Valued Components	• There should be a new second bullet summarizing the availability and quality of information required to support an effective assessment; • The description of existing conditions should be quantitative and qualitative; • There should be a bullet added regarding the need to describe the uncertainties in the assessment with respect to current conditions, potential project affects, the effectiveness of proposed mitigations, and characterization of residual effects;	The availability and quality of data used to support the EA has been described in the respective VC sections in Part B of the Application. Extensive studies and field programs have been conducted and describe existing conditions in the Local Study Area (LSA) (Local Study Area (LSA)) and the Regional Study Area (RSA). Additional studies were added to understand the habitats and potential species occurrence where data was limited. Data used to describe baseline conditions are considered sufficient to inform the EA. Uncertainties related to the assessment are also described in the Application, e.g. related to modelling and residual effects.		The availability and quality of data used to support the EA has been described in the respective VC sections in Part B of the Application. Extensive studies and field programs have been conducted and describe existing conditions in the Local Study Area (LSA) (Local Study Area (LSA)) and the Regional Study Area (RSA). Additional studies were added to understand the habitats and potential species occurrence where data was limited. Data used to describe baseline conditions are considered sufficient to inform the EA. Uncertainties related to the assessment are also described in the Application, e.g. related to modelling and residual effects. See Section 3.3 of the dAIR.
FN-KNC-1a	2015, January		Ktunaxa Nation Council	Other	• We are unsure how the indicator of "information provided by First Nations communities or First Nations coordinators" will be implemented;	Information provided by First Nations was included in the baseline. Part C of the Application will include First Nations Cultural Heritage.		
FN-KNC-1b	2015, January		Ktunaxa Nation Council	Other	• We want to highlight the opportunity provided by understanding the predicted vs. real effects related to installation of the recent near correlate of the Revelstoke 5 generator; and	BC Hydro has compared predicted with real effects of the addition of REV5 and this information has been incorporated in the baseline. A summary table will be provided.		BC Hydro has compared predicted with real effects of the addition of REV5 and this information has been incorporated in the existing conditions. A summary table was provided to First Nations in July 2016. Results from REV5 were considered and are discussed in the existing conditions sections as noted in Sections 4.2.2 (Fish and Fish Habitat), 4.3.2 (Ecological Communities), 4.4.2 (Plants), 4.5.2 (Herptiles), 4.6.2 (Birds), 4.7.2 (Mammals), 5.2.2 (Economic), 6.2.2 (Socio-Community), and 7.2.2 (Historical and Archaeological Heritage) of the dAIR. There were no predicted effects monitored for REV5 for the Land and Resource Use or Human Health VCs, therefore, the results of REV5 are not specifically noted for these in the dAIR.
FN-KNC-1c	2015, January		Ktunaxa Nation Council	Other	• We also want to highlight the importance of providing, as near as reasonable, a sense of the pre-disturbance (pre-Revelstoke Dam) environments in order to understand trends that have already occurred or are occurring, and to support reclamation and management of riparian and aquatic environments to re-establish similar ecosystems through operations.	BC Hydro has included a discussion of pre Dam conditions in the baseline. This information has been considered in the effects assessment.		BC Hydro has included a discussion of pre-Dam conditions in the existing conditions subsectoin for all VCs. This information has been considered in the effects assessment. See Section 3.3 of the dAIR.

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FN-KNC-2	2015, January		Ktunaxa Nation Council	Other	In addition to VCs listed in table 4.1, other VCs identified in Section 15 (Aboriginal rights) and Section 16 (Aboriginal interests) by the Ktunaxa Nation or other First Nations or Aboriginal communities should be considered fully as valued components, and should be assessed based on appropriate standards comparable to those required for VCs in table 4.1. The KNC will approach this by including a Ktunaxa assessment on our rights and interests in Sections 15 and 16 based on analysis of VCs from other components, as well as Ktunaxa identified VCs if needed. As per our consultation agreement, the Ktunaxa and BC Hydro will work jointly to prepare a Section 15 and 16 assessment of the proposed Project, as it pertains to Ktunaxa rights and interests, that is agreeable to both parties. It is critical that a full and meaningful assessment is conducted for all valued components associated with Ktunaxa rights and interests. The KNC has included a draft Table of Contents for these sections.	BC Hydro has agreed and accepted the draft Table of Contents for Part C.		
FN-KNC-20	2015, January		Ktunaxa Nation Council	Project Interactions	• The Proponent should be required to provide a list of all potential interactions with VCs	Project - VC interactions will be described in the relevant VC sections and a summary matrix will be provided		Project - VC interactions will be described in the relevant VC sections and a summary matrix will be provided. The VC interactions are in Appendix A of the dAIR
FN-KNC-21	2015, January		Ktunaxa Nation Council	Evaluation of Residual Project Effects	• The AIR should describe how residual effects will be assessed for significance, including providing quantitative thresholds and measures of significance. The assessment of residual effects should include an evaluation of how well effects of Rev 5 were accounted for, and whether there are areas in which higher than expected (or lower than expected) effects were seen. This summary should be used to inform the development of mitigations for Rev 6.	A description of how residual effects will be assessed is provided in the dAIR. A summary of the predicted effects of REV5 was made available in a seperate document in September, 2016.		A description of how residual effects will be assessed is provided in Section 3.4 through 3.10 in the dAIR. A summary of the predicted effects of REV5 was provided to First Nations in July 2016.
FN-KNC-22	2015, January		Ktunaxa Nation Council	Cumulative Effects	• A broad range of potential effects exist on many of the VCs, from projects other than the hydro-electric projects listed. The AIR should include at a minimum the list of project types that will be included within reasonably foreseeable projects for assessing cumulative effects. The AIR should clearly state that existing cumulative effects on Ktunaxa rights and interests within the Columbia River are already significantly impacted, and any incremental impact occurs within this context • It is difficult to understand how the effects of Mica Units 5 and 6 can be incorporated into the baseline with sufficient relevant information as commencement of operation of the 6th unit is not expected until late 2015. Impacts of Mica 5 and 6 operations should be considered in the context of reasonably foreseeable projects, because the cumulative effects assessment will be relying on predicted rather than observed effects. • Reasonably foreseeable projects and activities should include the possible Columbia River Treaty 'ecosystem function' and 'stable Arrow' operational scenarios. Re climate change: • The assessment approach should include the development of a small number (2 – 3) of 2050	• The cumulative effects assessment will consider projects with the potential to interact with any residual incremental effects of Rev 6, including those other than hydroelectric projects. Cumulative effects on First Nations rights and interests will be addressed in part c of the Environmental Assessment Certificate Application. • The results of the Mica units 5 and 6 monitoring will be included in the assessment. • A discussion of future operation scenerios including climate change will be included in the assessment.		• The cumulative effects assessment will consider projects with the potential to interact with any residual incremental effects of Rev 6, including those other than hydroelectric projects. Cumulative effects on First Nations rights and interests will be addressed in part c of the Environmental Assessment Certificate Application. See Section 3.10 of the dAIR. • The results of the Mica units 5 and 6 monitoring will be included in the assessment. • A discussion of future operation scenerios including climate change will be included in the assessment. See Section 4.1 of the dAIR.
FN-KNC-22	2015, January		Ktunaxa Nation Council	Cumulative Effects	Responses to FN-KNC-22 continued	• CRT: As part of the Columbia River Treaty Review, 'ecosystem function' and 'stable Arrow' operational scenarios were mitigation measures considered by the Province of BC as alternatives to the Province continuing with the Columbia River Treaty. As the Province has decided to continue with the Columbia River Treaty, these alternatives will not proceed (see 'Columbia River Treaty Review, B.C. Decision' at http://blog.gov.bc.ca/columbiarivertreaty/files/2012/03/BC_Decision_on_Columbia_River_Treaty.pdf). The extent, if any, to which the Province may pursue any part of these measures in the future as a way of enhancing the Treaty is speculative and subject to US approval. As such, they are not reasonably foreseeable and lack sufficient detail to be assessed. • Climate Change: BC Hydro has climate and hydrological projections for the Revelstoke watershed for the 2050s and 2080s produced by Pacific Climate Impacts Consortium. The projections		0
FN-KNC-23	2015, January		Ktunaxa Nation Council	Fish	Amend sub-components and indicators in accordance with changes recommended above (section 4)	Fish and Fish Habitat Indicators pertaining to fish include relative abundance, condition and species evenness.		Fish and Fish Habitat Indicators pertaining to fish include relative abundance, condition and species evenness. Indicators are listed in Table 2 of Section 3.1 of the dAIR.
FN-KNC-24	2015, January		Ktunaxa Nation Council	Fish	The methods with respect to habitat use and quality should include modelling of habitat conditions at a full range of reservoir elevations and Revelstoke plant discharges with respect to depth, velocity, substrate composition and habitat area.	Hydrological modelling will be done for a range of reservoir elevations and plant discharges to predict depth and velocity and habitat area. Substrate composition will be assessed.		Hydrological modelling will be done for a range of reservoir elevations and plant discharges to predict depth and velocity and habitat area. Substrate composition will be assessed. The outline of the Hydrology Section is provided in Section 4.1 of the dAIR.

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FN-KNC-25	2015, January		Ktunaxa Nation Council	Fish	"Reviewing access to tributaries and habitat information" should include WUP and other sources.	Agreed		Agreed, WUP and other information sources was considered. See Section 16 of the dAIR.
FN-KNC-26	2015, January		Ktunaxa Nation Council	Fish	Methods with respect to the anadromous salmon restoration potential indicators should include review of available information on spawning and incubation habitat requirements (substrate, velocity, depth, temperature) for both Fraser and Columbia populations and review of available information with respect to fish passage (upstream and downstream) technologies.	This interest is acknowledged; however, anadromous salmon are not included in the scope of the EA. BC Hydro engaged R2 to assess any opportunities for the Project to aid in any potential future fish passage at Revelstoke Dam. The report is complete and available. Revelstoke Unit 6 project activities and operations will not preclude the ongoing potential for future fish passage or fish resource use of concern to First Nations. The Canadian Columbia River Intertribal Fisheries Commission (CCRIFC) has proposed the formation of a multiagency committee to start investigating the feasibility of salmon restoration in the Columbia. BC Hydro has agreed to participate in such a committee should it proceed		A venue for discussion of salmon and other broader issues will be through BCH/First Nations Relationship Agreements.
FN-KNC-27	2015, January		Ktunaxa Nation Council	Mitigation	Effects Assessment: Bullet 2 should be amended to include consideration of a full range of mitigation options, and not simply economically and technically feasible mitigations. Then, the selection of mitigation techniques can incorporate consideration of economic and technical feasibility.	The Core Committee, First Nations, regulators or the public may propose a full range of mitigation measures for consideration, however BC Hydro is accountable to its ratepayers to ensure mitigation measures are technically feasible and can be implemented in a financially responsible manner.		
FN-KNC-28	2015, January		Ktunaxa Nation Council	Fish	Proposed Follow-up & Monitoring: It is very clear that there will be a need for follow-up and monitoring programs with respect to potential project effects on fish resources, given the uncertainties associated with likely predicted effects arising from increased flow variability downstream of the Revelstoke Generating Station.	Proposed follow-up & monitoring will be considered as part of the assessment.		
FN-KNC-29	2015, January		Ktunaxa Nation Council	Plants	**Introduction:** • Why is the assessment confined to existing and available information? It would be appropriate to conduct field surveys for rare plants, rather than just reviewing past information and doing a desk top exercise. • Re federal or provincial listed species: first indicator should read "abundance and distribution of known occurrences of listed species". Note that "presence of suitable habitat" for listed plants is not a valid indicator based on site series modeling because rare plant occurrence is poorly correlated with site series and rare plants are often associated with microhabitat conditions that are hard to predict. These characteristics cannot be modeled according to provincial experts (J. Penny, Botanist, CDC and D. MacKillop, Regional Ecologist, FLNRO); therefore a field verification step would need to be performed to determine the proportion of polygons that actually support rare plants and this percentage would need to be applied to the modeled dataset. Second indicator should read "abundance, distribution and quality of suitable habitat for listed species" (based on verification). • The subcomponents should be specified for	1)The studies completed for the WUP and other programs included considerable effort within the Local Study Area (LSA) and data collected are sufficient to inform the EA. 2) We will review existing information from available studies (e.g., CLBMON 12, 33) to address abundance and distribution of known occurrences of listed plant species. Suitable habitat for listed species will consider the present quality of habitat within the study areas. A rare plant assessment was specifically completed at the capacitor station as part of the field studies in 2014. Rare plant occurrences have been documented in the MCR as a result of ongoing vegetation work related to WUP studies. 3) Information provided by First Nations will be included in Part B of the EA. Part C will be authored by First Nations.		0
FN-KNC-3	2015, January		Ktunaxa Nation Council	Other	In order for the KNC to undertake an appropriate assessment in Sections 15 and 16, BC Hydro and its consultants will be required to share baseline data and assessment information for many VCs beyond Section 15 and 16. Please identify the timeline for sharing baseline data and draft assessments for valued components.	The baseline was provided in January 2016 and an update, along with the assessment, was provided in July 2016.		
FN-KNC-30	2015, January		Ktunaxa Nation Council	Plants	Existing conditions: • We recommend including a measure of quality for all culturally important plants encountered during surveys, as this is an important consideration for the assessment of effects to rights and interests. At a minimum including field work to assess baseline quality conditions in important cultural use areas that may be impacted by the Project, as identified by Ktunaxa knowledge holders. The Ktunaxa preference would be that this be included as an indicator for the VC suggested above.	Information pertaining to culturally important plants will be provided as part of the "Traditional Use and Knowledge" component in Part C.		
FN-KNC-31	2015, January		Ktunaxa Nation Council	Plants	Existing conditions: It is not adequate to identify habitat for rare plants; a field verification step (as indicated above) is necessary to determine the proportion of suitable habitat which actually supports rare plants.	We will review existing information from available studies (e.g., CLBMON 12, 33) to address abundance and distribution of known occurrences of listed plant species. Suitable habitat for listed species will consider the present quality of habitat within the study areas. A rare plant assessment was specifically completed at the capacitor station as part of the field studies in 2014. Rare plant occurrences have been documented in the MCR as a result of ongoing vegetation work related to WUP studies.		

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NO	DATE	COMMENTS ORIGINATED		Topic Subject	Comments	RESPONSE	If unsatisfactory - Comments	Responses
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FN-KNC-32	2015, January		Ktunaxa Nation Council	Plants	Effects Assessment: Bullet 2 should be amended to include consideration of a full range of mitigation options, and not simply economically and technically feasible mitigations. Then, the selection of mitigation techniques can incorporate consideration of economic and technical feasibility.	The Core Committee, First Nations, regulators or the public may propose a full range of mitigation measures for consideration, however BC Hydro is accountable to its ratepayers to ensure mitigation measures are technically feasible and can be implemented in a financially responsible manner.		
FN-KNC-33	2015, January		Ktunaxa Nation Council	Ecological Communities	**Introduction:** • Re provincially listed ecosystems: should also include species composition and vegetation structure within listed ecosystems/communities as an indicator. • Re provincially listed ecosystems, should also include inundation frequency, depth, duration, and seasonality as habitat indicators. • Same two comments for sensitive ecosystems. • Re ecosystem health and function for biodiversity: Should read as an indicator description as follows: "Spatial extent, composition and structure of all ecosystems and habitats, including associated vegetation assemblages and wildlife." • For RR and MCR – ecosystems considered should include culturally important ecosystems for the Ktunaxa, as identified by Ktunaxa knowledge holders. This would include riparian areas, aquatic ecosystems, wetlands among others any of which sustained particular plants and animals of cultural importance. The assessment should be conducted based on the approach developed by KNC, looking at impacts to culturally important ecosystems based on actual occurrences and condition of culturally important	First part of comment see response to FN-KNC-11. Since the Draw Down Zone (DDZ) portion of the Local Study Area (LSA) (Local Study Area (LSA)) is heavily influenced by the operations of the Arrow Lakes Reservoir and revegetation programs, the vegetation communities present in the Draw Down Zone (DDZ) are not representative of any of the provincially-listed ecological communities at risk. As such, inundation frequency, depth, and duration are not relevant. Within Section 4.3 sensitive ecosystems have been defined for the assessment as wetlands, old-growth forest, and riparian areas. Section 4.3 provides information on sensitive ecosystems including: the size, location, and descriptions of the larger wetland complexes explicitly identified by members of the Core Committee; descriptions of the vegetation communities (riparian) found within the Draw Down Zone (DDZ) – including		First part of comment see response to FN-KNC-11. Since the Draw Down Zone (DDZ) portion of the Local Study Area (LSA) (Local Study Area (LSA)) is heavily influenced by the operations of the Arrow Lakes Reservoir and revegetation programs, the vegetation communities present in the Draw Down Zone (DDZ) are not representative of any of the provincially-listed ecological communities at risk. As such, inundation frequency, depth, and duration are not relevant. Within Section 4.3 sensitive ecosystems have been defined for the assessment as wetlands, old-growth forest, and riparian areas. Section 4.3 provides information on sensitive ecosystems including: the size, location, and descriptions of the larger wetland complexes explicitly identified by members of the Core
FN-KNC-34	2015, January		Ktunaxa Nation Council	Ecological Communities	Existing conditions - Transmission facilities • Why are sensitive habitats not considered as an indicator for the transmission component?	Sensitive habitats will be part of the assessment for the Transmission Capacitor Station and the documents will be updated to reflect this.		Sensitive habitats will be part of the assessment for the Transmission Capacitor Station as indicated in Section 4.3.2 of the dAIR.
FN-KNC-35	2015, January		Ktunaxa Nation Council	Ecological Communities	Effects Assessment: Bullet 2 should be amended to include consideration of a full range of mitigation options, and not simply economically and technically feasible mitigations. Then, the selection of mitigation techniques can incorporate consideration of economic and technical feasibility.	The Core Committee, First Nations, regulators or the public may propose a full range of mitigation measures for consideration, however BC Hydro is accountable to its ratepayers to ensure mitigation measures are technically feasible and can be implemented in a financially responsible manner.		
FN-KNC-36	2015, January		Ktunaxa Nation Council	Birds	Introduction: • Re federal or provincial listed species: first indicator should read "abundance and distribution of known occurrences of listed species". Second indicator should read ""abundance, distribution and quality of suitable habitat for listed species". • Re migratory birds: first indicator should read "abundance, distribution and diversity of migratory bird species". • Re raptors: first indicator should read "abundance, distribution and diversity of raptor species". • Include as a guild cavity nesting birds: first indicator should read "abundance, distribution and diversity of cavity-nesting bird species"; second indicator would be "abundance, distribution	Acknowledged. We will review existing information from the WUP studies (e.g., CLBMON 36, 39, 40) to address abundance and distribution of known occurrences of listed and migratory bird and raptor species, as well as the abundance, distribution and quality of known suitable habitat for listed and migratory bird and raptor species. Migratory birds and raptors will include cavity nesting species.		Acknowledged. We will review existing information from the WUP studies (e.g., CLBMON 36, 39, 40) to address abundance and distribution of known occurrences of listed and migratory bird and raptor species, as well as the abundance, distribution and quality of known suitable habitat for listed and migratory bird and raptor species. Migratory birds and raptors will include cavity nesting species. The indicators are listed in Table 2 Section 3.1 of the dAIR.
FN-KNC-37	2015, January		Ktunaxa Nation Council	Mitigation	Effects Assessment: Bullet 2 should be amended to include consideration of a full range of mitigation options, and not simply economically and technically feasible mitigations. Then, the selection of mitigation techniques can incorporate consideration of economic and technical feasibility.	The Core Committee, First Nations, regulators or the public may propose a full range of mitigation measures for consideration, however BC Hydro is accountable to its ratepayers to ensure mitigation measures are technically feasible and can be implemented in a financially responsible manner.		
FN-KNC-38	2015, January		Ktunaxa Nation Council	Herptiles	• Re federal or provincial listed species: first indicator should read "abundance and distribution of known occurrences of listed species". Second indicator should read "abundance, distribution and quality of suitable habitat for listed species".	See response to FN-KNC-14. Acknowledged. We will review existing information from the WUP studies (e.g., CLBMON 11B3, 37) to address abundance and distribution of known occurrences of listed herptile species, as well as the abundance, distribution and quality of known suitable habitat for listed herptile species.		See response to FN-KNC-14. Acknowledged. We will review existing information from the WUP studies (e.g., CLBMON 11B3, 37) to address abundance and distribution of known occurrences of listed herptile species, as well as the abundance, distribution and quality of known suitable habitat for listed herptile species. Listed in Table 2 of Section 3.1 in the dAIR.
FN-KNC-39	2015, January		Ktunaxa Nation Council	Herptiles	Effects Assessment: Bullet 2 should be amended to include consideration of a full range of mitigation options, and not simply economically and technically feasible mitigations. Then, the selection of mitigation techniques can incorporate consideration of economic and technical feasibility.	The Core Committee, First Nations, regulators or the public may propose a full range of mitigation measures for consideration, however BC Hydro is accountable to its ratepayers to ensure mitigation measures are technically feasible and can be implemented in a financially responsible manner.		
FN-KNC-4	2015, January		Ktunaxa Nation Council	Other	We are encouraged to see the improvements in this dAIR but note that it will require additional effort from the KNC and support that was not anticipated to complete this assessment in the original scope of the Ktunaxa consultation agreement for the Revelstoke Generating Station Unit 6 EA process. The KNC requests a meeting with BC Hydro to further discuss our approach and capacity needs.	Completed in 2015		

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FN-KNC-40	2015, January		Ktunaxa Nation Council	Mammals	• Re federal or provincial listed species: first indicator should read "abundance and distribution of known occurrences of listed species". Second indicator should read ""abundance, distribution and quality of suitable habitat for listed species". • Re ungulates: first indicator should read "abundance, distribution and diversity of ungulate species and their movement corridors". Second should read "abundance, distribution and quality of winter range habitat" Re mammals: • Furbearers (e.g., mink, river otter, beaver) should be included as a sub-component, with an associated first indicator of abundance, distribution and diversity of furbearer species'. Second indicator should read "abundance, distribution and quality of habitat".	See response to FN-KNC-15. Acknowledged. We will review existing information from the WUP studies (e.g., CLBMON 11B1) and publicly available government data to address abundance and distribution of known occurrences of listed mammal/ungulate species, as well as the abundance, distribution and quality of known suitable habitat for listed mammal/ungulate species. Furbearer are included in the Mammals VC and have been included in Section 4.7 of the assessment. The following wording has been included in the assessment under the sub-component Traditional Use and Knowledge: "Furbearers have been identified as species of cultural or economic importance to First Nations"		See response to FN-KNC-15. Acknowledged. We will review existing information from the WUP studies (e.g., CLBMON 11B1) and publicly available government data to address abundance and distribution of known occurrences of listed mammal/ungulate species, as well as the abundance, distribution and quality of known suitable habitat for listed mammal/ungulate species. Indicators are listed in Table 2, Section 3.1 of the dAIR. Furbearer are included in the Mammals VC and have been included in Section 4.7 of the assessment. The following wording has been included in the assessment under the sub-component Traditional Use and Knowledge: "Furbearers have been identified as species of cultural or economic importance to First Nations" Within the Mammals Section (Section 4.7) the sub-components include Mammal Species at Risk, Ungulates
FN-KNC-41	2015, January		Ktunaxa Nation Council	Mammals	Effects Assessment: Bullet 2 should be amended to include consideration of a full range of mitigation options, and not simply economically and technically feasible mitigations. Then, the selection of mitigation techniques can incorporate consideration of economic and technical feasibility.	The Core Committee, First Nations, regulators or the public may propose a full range of mitigation measures for consideration, however BC Hydro is accountable to its ratepayers to ensure mitigation measures are technically feasible and can be implemented in a financially responsible manner.		
FN-KNC-42	2015, January		Ktunaxa Nation Council	Economic Background	The assessment should explicitly consider First Nations employment statistics (from BC Hydro) and include a study (as background information) of how effective mitigations for Rev 5 were for increasing First Nations employment and procurement. This would provide useful context for moving forward with additional mitigations for Rev 6. The Ktunaxa preference would be to have Ktunaxa Economic Rights and Interests included as a VC in Section 15.	Information on the number of First Nation hires on the Rev 5 Project are included in Section 5.2, Economy. Information describing the length of employment for these employees is not available. Mitigation measures to enhance First Nation opportunities at the Rev6 project in light of the experience at Rev 5 are included in the assessment. First Nations economic Rights and Interests will be discussed in Part C.		Information on the number of First Nation hires on the Rev 5 Project are included in Section 5.2, Economy. Information describing the length of employment for these employees is not available. Mitigation measures to enhance First Nation opportunities at the Rev6 project in light of the experience at Rev 5 are included in the assessment. First Nations economic Rights and Interests will be discussed in Part C. The requirement for this information is outlined in Section 5.2 of the dAIR.
FN-KNC-43	2015, January		Ktunaxa Nation Council	Economy	Include socio-economic studies & reports from Affected First Nations; replace 'First Nation' with 'Affected First Nations' Section 6.2: Economy: • The Economy VC should include a sub-component specific to First Nations employment and procurement-this may be included here or in section 15. 6.2 Economy - Data Sources 1. Employment and more general labour force data needs to be broken out for the Aboriginal populations in the regional, provincial and federal statistics as well as disaggregated to the individual band level (for on and off reserve members) (Note: this could be done in Section 16 or in the broader baseline but some of the Aboriginal and non-Aboriginal data needs to be together for comparative context). 2 – With the elimination of the long form census and lack of Aboriginal employment data in the Labour Force Survey, Statistics Canada data has been significantly reduced and undermined, leaving large gaps for Aboriginal data. It is not adequate to rely on existing government statistical sources. Sources may need to include First Nation survey and census data instead where	Affected First Nations are identified in Section 11 Order and listed in the Preface of the AIR. The Technical Boundaries sections of Section 6.2 Socio-community and 5.2 Economy acknowledge the limitations of Statistics Canada data generally and for Aboriginal and First Nations populations. As the limitations around statistical data are understood, wherever possible, the Socio-community and Economy Assessments will report and cross reference data provided by First Nations in Part C of the Assessment. Information regarding employment levels at the local, regional, and First Nation level are included in Section 5.2, Economy. Information on the number of First Nation hires on the Rev 5 Project are included in Section 5.2, Economy. Information describing the length of employment for these employees is not available. Mitigation measures to enhance First Nation opportunities at the Rev6 project in light of the experience at		Affected First Nations are identified in Section 11 Order and listed in the Preface of the AIR. The Technical Boundaries sections of Section 6.2 Socio-community and 5.2 Economy acknowledge the limitations of Statistics Canada data generally and for Aboriginal and First Nations populations. As the limitations around statistical data are understood, wherever possible, the Socio-community and Economy Assessments will report and cross reference data provided by First Nations in Part C of the Assessment. Information regarding employment levels at the local, regional, and First Nation level are included in Section 5.2, Economy. Information on the number of First Nation hires on the Rev 5 Project are included in Section 5.2, Economy. Information describing the length of employment for these employees is not available. Mitigation measures
FN-KNC-44	2015, January		Ktunaxa Nation Council	Economy	6.2 Economy - Indicators for assessing VC and sub-components General data: Will employment include more than just rates-e.g. breakdowns by sector and/or length of employment? Are there indicators for education and training levels? Aboriginal data (Either in 6.2 or in Section 16). Do indicators include the following? The level of interest of band members in project employment and types of employment they are interested in. FN member training levels, interests and gaps. Barriers to accessing training and employment. Engagement of members in informal traditional employment.	Application will utilize publicly available economic conditions data and consider the indicators suggested. Further information will be provided by First Nations in Part C. This information will inform mitigation and potential monitoring.		Application will utilize publicly available economic conditions data and consider the indicators suggested. Further information will be provided by First Nations in Part C. This information will inform mitigation and potential monitoring. See Section 5.2 of the dAIR.

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FN-KNC-45	2015, January		Ktunaxa Nation Council	Economy	**Existing conditions** • Given data gaps identified in 6.2, where the Application will describe the studies undertaken to characterize the existing conditions and trends, it may be necessary to include other studies to fill gaps in data (e.g. focus groups or First Nation survey/census data where it exists). • this section should include a description of barriers to meaningful First Nations employment with BC Hydro. Interviews with successful applicants may be a useful way to highlight strategies that have worked, to build upon for future mitigations. • The AIR should explicitly include a section (under existing conditions) that considers impacts to the traditional economy from the Revelstoke Dam, as background context for the extent of existing impacts within the Columbia River area.	The Technical Boundaries sections of Section 6.2 Socio-community and 5.2 Economy acknowledge the limitations of Statistics Canada data generally and for Aboriginal and First Nations populations. As the limitations around statistical data are understood, wherever possible, the Socio-community and Economy Assessments will report and cross reference data provided by First Nations in Part C of the Assessment. Information regarding employment levels at the local, regional, and First Nation level are included in Section 5.2, Economy. Aboriginal procurement initiatives and measures to enhance First Nations employment opportunities at the Rev6 project will be included in the assessment. First Nations economic Rights and Interests, including Traditional economy considerations, will be discussed in Part C.		The Technical Boundaries sections of Section 6.2 Socio-community and 5.2 Economy acknowledge the limitations of Statistics Canada data generally and for Aboriginal and First Nations populations. As the limitations around statistical data are understood, wherever possible, the Socio-community and Economy Assessments will report and cross reference data provided by First Nations in Part C of the Assessment. Information regarding employment levels at the local, regional, and First Nation level are included in Section 5.2, Economy. Aboriginal procurement initiatives and measures to enhance First Nations employment opportunities at the Rev6 project will be included in the assessment. First Nations economic Rights and Interests, including Traditional economy considerations, will be discussed in Part C. See Section 5.2 of the dAIR.
FN-KNC-46	2015, January		Ktunaxa Nation Council	Social Background	Include socio-economic studies & reports from Affected First Nations; replace 'First Nation' with 'Affected First Nations'	Affected First Nations are identified in Section 11 Order and listed in the Preface of the AIR.		
FN-KNC-47	2015, January		Ktunaxa Nation Council	Social Background	The first sentence in the background includes social and cultural context but section 7.2 references only social and includes no indicators for culture. Where the second sentence of the first paragraph references economic effects, should that not reference social and cultural?	The Heritage and Archaeology candidate VC has been split into 'First Nations Cultural Heritage' and 'Historical and Archaeological Heritage'. 'First Nations Cultural Heritage' will be assessed by First Nations in Part C of the Application. First Nations economic Rights and Interests, including social and cultural values, may be discussed in Part C. Yes, the second sentence should reference social and cultural effects and will be updated.		
FN-KNC-48	2015, January		Ktunaxa Nation Council	Socio-Community	Include information from Affected First Nations employment agencies; types of jobs; apprenticeship opportunities; number of employment opportunities; (track) number of Affected First Nations working on site & in what capacity Section 7.2 Socio-Community Indicators If culture is in this section – indicators will be needed such as First Nations language and cultural continuity (ability to engage in and engagement in practice of culture). It is the Ktunaxa preference that Language and Culture be included as VCs in Section 15. Will the housing baseline include quality and suitability (indicators include housing in need of major repair, and suitability of accommodations according to the National Occupancy Standard (NOS) measures)? Safety – Potential changes to reservoir levels and downstream flows could result in ice formation changes that could impact on safety. Where does the AIR include an assessment of impacts from dam construction and traffic increases, as well as increases in hunting and fishing pressure, on Ktunaxa social and economic conditions?	Information regarding employment levels at the local, regional, and First Nation level are included in Section 5.2, Economy. The Heritage and Archaeology candidate VC has been split into 'First Nations Cultural Heritage' and 'Historical and Archaeological Heritage'. 'First Nations Cultural Heritage' section will be assessed by First Nations in Part C of the Application, and may include indicators such as language and cultural continuity. The housing baseline took into account conditions including quality and suitability. - BC Hydro does not expect changes in reservoir levels or downstream flows that would affect ice formation. - Traffic is an IC considered when assessing the Mammals and Socio-community VCs.		Information regarding employment levels at the local, regional, and First Nation level are included in Section 5.2, Economy. The Heritage and Archaeology candidate VC has been split into 'First Nations Cultural Heritage' and 'Historical and Archaeological Heritage'. 'First Nations Cultural Heritage' section will be assessed by First Nations in Part C of the Application, and may include indicators such as language and cultural continuity. The housing baseline took into account conditions including quality and suitability. - BC Hydro does not expect changes in reservoir levels or downstream flows that would affect ice formation. - Traffic is an IC considered when assessing the Mammals and Socio-community VCs. See Section 6 - Social Effects Assessment of the
FN-KNC-49	2015, January		Ktunaxa Nation Council	Land and Resource Use	• See comments above on Lands and Resource Use VC (section 4) • First Nations governance VC assessment should include the MCR as a result of the significant First Nations interest in this area. • The bullet re 'Introduce the assessment for land and resource use….' Should include the elements of aboriginal rights use and values.	Issues of First Nations governance, land and resource use, Aboriginal Rights and Interests are discussed in Part C.		
FN-KNC-5	2015, January		Ktunaxa Nation Council	Rephrasing	Page (ii) typo; Akisnuk (Akisqnuk); Rather than use term 'First Nation' our preference would be to use 'Affected First Nations' (and define as First Nations impacted by the project) and list all First Nations impacted by the project	Typo error corrected. This section will include potentially impacted First Nations identified in the Section 11 Order.		

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FN-KNC-50	2015, January		Ktunaxa Nation Council	Heritage And Archaeology	It is not appropriate for the proponent to assess Ktunaxa intangible cultural heritage. The Ktunaxa will make this assessment on their own and describe the method and results within part c of the application. Please remove sub-components: intangible cultural heritage as they relate to the Ktunaxa. Sub-component "Locations with protected archaeological or historical sites, features, and artifacts" should be re-worded to recognize that the areas impacted by the Revelstoke 6 project have not been fully surveyed for archaeological sites and therefore there are many areas where recognized "protected" archaeological sites may exist that have not been recorded. This sub-component should be looking at areas having the potential to contain a "protected" archaeological or historical site, feature and artifact. Please remove the indicator "measurable disturbance or loss of elements essential to the preservation or character of intangible cultural heritage" as it pertains to the Ktunaxa. It is unclear how the proponent will be identifying the subcomponent "locations where First Nations Activities took place (i.e. cultural heritage sites)". It is also unclear as to the timeframe of this	Intangible cultural heritage as a sub-component has been removed. The Heritage and Archaeology candidate VC has been split into 'First Nations Cultural Heritage' and 'Historical and Archaeological Heritage'. 'First Nations Cultural Heritage' section will be assessed by First Nations in Part C of the Application. An assessment of the potential for unknown archaeological sites will be undertaken.		Intangible cultural heritage as a sub-component has been removed. The Heritage and Archaeology candidate VC has been split into 'First Nations Cultural Heritage' and 'Historical and Archaeological Heritage'. 'First Nations Cultural Heritage' section will be assessed by First Nations in Part C of the Application. An assessment of the potential for unknown archaeological sites will be undertaken. See Section 7.2 of the dAIR.
FN-KNC-51	2015, January		Ktunaxa Nation Council	Health	The assessment for human health focuses on changes in electromagnetic field expected at the capacitor site. Potential construction phase effects need to be considered. Construction phase could impact health through: • workplace health and safety, • Increased traffic – air quality issues as well as accident risk, and increased risk of collision on roads. Operation phase changes in reservoir levels or downstream flows need to be considered. These could impact health through: - impact on harvesting of traditional foods and resources (including but not limited to: small animals, burbot and migratory waterfowl) - ice formation changes, increased variability in downstream flows and potential safety risks. - Reservoir level changes – could impact air quality through increased draw down variability and related dust. The Ktunaxa take an ecological approach to human health including confidence in wild foods. Given there is potential for impacts on harvesting, indicators are needed for access to and confidence in wild food. These could include First	Workplace health and safety requirements consistent with Worksafe BC will be included in all contract documents, monitored, and enforced. Traffic and associated potential effects are discussed in the EA. Potential effects on traditional foods harvesting and resources will be discussed in Part C. BC Hydro does not expect changes in reservoir levels or downstream flows that would affect ice formation. There will be no change to normal operating range, and daily fluctuations would be similar for REV5 and REV 6. However, on rare occasions during winter, the increase in daily fluctuations could be up to 0.2m. These rare fluctuations will not effect wildlife. Reservoir ice was assessed in REV 5 with regard to potential effects to wildlife and this was determined to not be an issue. This is not considered to be an issue as Revelstoke Reservoir does not freeze over other than in isolated bays and inlets around and north of Downie Arm		Confirmed. The potential effects of increased traffic on air quality are considered in Section 4.1.4 Air Quality and Noise. Workplace health and safety requirements consistent with Worksafe BC will be included in all contract documents, monitored, and enforced. Traffic and associated potential effects are discussed in the EA. See Section 6.2 of the dAIR. Potential effects on traditional foods harvesting and resources will be discussed in Part C. BC Hydro does not expect changes in reservoir levels or downstream flows that would affect ice formation. There will be no change to normal operating range on Revelstoke reservoir, and daily fluctuations would be similar for REV5 and REV 6. However, on rare occasions during winter, the increase in daily
FN-KNC-52	2015, January		Ktunaxa Nation Council	Effects of the Environment on the project	The application should identify any potential for synergistic or other cumulative effects between extreme events (weather, seismic, fore and climate change) and potential residual impacts to any of the VCs addressed in aforementioned sections. Section 11.0 re: climate change: The AIR should include modeling the likely effects of climate change on water levels upstream of Revelstoke Dam, and what these projected changes might mean for fluctuations within the reservoir, as well as downstream of the dam (Firelight).	The modelling and methodologies to assess the hydrological effects of the Project incorporate a broad range of climate and weather conditions. Climate change is discussed in Section 10 of the EA		The modelling and methodologies to assess the hydrological effects of the Project incorporate a broad range of climate and weather conditions. See Section 4.1 of the dAIR.
FN-KNC-53	2015, January		Ktunaxa Nation Council	Summary of Proposed Environmental and Operational Management Plans	The AIR should include a list of these plans, to allow for review and gap analysis (Firelight).	A list of management plans are included in Section 13 of the AIR.		
FN-KNC-54	2015, January		Ktunaxa Nation Council	Aboriginal Rights and Treaty Rights	The first paragraph should be made more comprehensive by referring to aboriginal interests more generally, including First Nation treaty and aboriginal rights (including title). The AIR should require the Proponent to confirm whether a traditional use study or other indigenous knowledge-based baselines or assessment studies will be supported in relation to the proposed Project, and for which First Nations or aboriginal groups. Proponent should also clarify how the contributions of each First Nation or aboriginal group will be included in the application.	In the VC document, Aboriginal Interests is defined and includes claimed or proven Aboriginal Rights (title) and Treaty Rights. Available Traditional Use information and other Indigeneous knowledge will inform Part B and C. The contribution of each First Nation will be described in the Application.		
FN-KNC-55	2015, January		Ktunaxa Nation Council	Summary of Residual Effects	Table 19.1 should include a column in which the uncertainty associated with each potential effect and the effectiveness of proposed mitigations.	The availability and quality of data used to support the EA has been described in the respective VC sections in Part B of the Application. Uncertainties related to the assessment are also described in the Application, e.g. related to modelling and residual effects.		This information will be provided in the application consistent with the requirements of 3.3 of the dAIR. Uncertainties related to the assessment are also described in the Application, e.g. related to modelling and residual effects.
FN-KNC-56	2015, January		Ktunaxa Nation Council	Summary of Mitigation and Follow up measures	Table 20.1 should include a column in which the entities (both inside and outside of BC Hydro) and/or individuals responsible for implementation of the mitigation are identified	Bc Hydro views identification of responsible agencies as sufficient		
FN-KNC-57	2015, January		Ktunaxa Nation Council	Conclusion	The conclusion should include a summary of how the project, as assessed, will contribute to the stewardship, economic and other goals of First Nations.	The conclusion is focussed on a summary of residual effects. The summary on contibutions to stewardship and , economic and other goals can be included in Sec C		The conclusion is focussed on a summary of residual effects. The summary on contributions to stewardship and , economic and other goals can be included in Sec C

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FN-KNC-59	2015, January		Ktunaxa Nation Council	Valued Components	•Revelstoke 6 baseline sections should include both a current and a pre-development baseline (at least prior to reservoir), including trend over time data, for all VCs so that decision makers can understand the context of past change to which Revelstoke 6 Project impacts would contribute. •Cumulative effects, including reasonably foreseeable futures, should be estimated with consideration of foreseeable development, as well as anticipated changes in the environment including climate change and forest fire. • Thresholds of significance should be clearly identified for each VC, and should consider Aboriginal perspectives. • Clearly described and robust metrics should be used, and in some cases developed, for each of the VCs to better understand the extent of change and potential impacts. These metrics should be based on current scientific literature and will ensure transparency and unbiased determinations. In many cases there is a heavy reliance on judgments made by one professional, which may not, in the opinion of another, constitute evidence of a significant impact. ***(Baseline Table, General Comments)***	Pre and post dam conditions are included in the baseline as they contribute to the overall understanding of the VCs. Reasonably foreseeable future projects and environmental changes will be included in the Cumulative Effects assessment. Climate Change is discussed in Section 10 of the EA. Thresholds of significance for VCs are described in the dAIR, and consider information provided by First Nations through Consultation and information-sharing. The evaluation of the VC, indicators, and methods for review are based scientific literature and the findings of previous studies and monitoring programs, as well as the experience and expertise of qualified professionals.		Pre and post dam conditions are included in the baseline as they contribute to the overall understanding of the VCs. See Section 3.3 of the dAIR. Reasonably foreseeable future projects and environmental changes will be included in the Cumulative Effects assessment. See Section 3.10 of the dAIR. Climate Change and forest fires are discussed as outlined in Section 10 of the dAIR. Thresholds of significance for each VC are described in the dAIR, and consider information provided by First Nations through Consultation and information-sharing. The evaluation of the VC, indicators, and methods for review are based scientific literature and the findings of previous studies and monitoring programs, as well as the experience
FN-KNC-6	2015, January		Ktunaxa Nation Council	Proposed Project Description	Proposed Project Description: The Proponent should include a link to the Project Description in this section of the AIR.	Completed		
FN-KNC-60	2015, January		Ktunaxa Nation Council	Fish	We don't appear to have access to the references, thus this comment may be misguided. However, the kokanee entrainment reports (e.g. Biosonics) prepared for the MCA - REV Fish Entrainment Strategy would seem to be directly relevant. ***(Baseline Table)***	Agreed, this reference is directly relevant to entrainment and was included in development of the Entrainment Strategy for REV and review related to REV6.		
FN-KNC-61	2015, January		Ktunaxa Nation Council	Fish	#3 should indicate that 'No change in flow regime could be detected IN THE STUDY AREA could be detected after the 5th unit was online. Clearly, further upstream flow regime changes could be detected. Should also reference the monitoring undertaken associated with the placement of gravel/cobble adjacent to the Revelstoke golf course to attempt to increase retention of eggs and larvae within the spawning area (contact Jamie Crossman) What is the reason for this particular list of subcomponents? why not all species identified in the long-term fish indexing program Last sentence under F48 does not make sense ***(Baseline Table)***	Changes in flow regime and habitat resulting from Rev 5, and the results of all relevant WUP studies conducted to date were considered in the baseline. The subcomponents selected are representative of the environmental values affected by the Project, and were determined through discussions with First Nations, regulators, and stakeholders.		Changes in flow regime and habitat resulting from Rev 5, and the results of all relevant WUP studies conducted to date were considered in the baseline. See Section 16 of the dAIR for a list of relevant references. The subcomponents selected are representative of the environmental values affected by the Project, and were determined through discussions with First Nations, regulators, and stakeholders.
FN-KNC-62	2015, January		Ktunaxa Nation Council	Fish	BC Hydro should: • include a specific measure for each species dealing with potential for increases in entrainment in different seasons due to the addition of the 6th generator. ***(Baseline Table)***	Entrainment Strategy risk screening concluded that kokanee were the species most at risk of entrainment at REV. Entrainment (specifically kokanee) is an indicator for the Fish and Fish Habitat VC.		Entrainment Strategy risk screening concluded that kokanee were the species most at risk of entrainment at REV. Entrainment (specifically kokanee) is an indicator for the Fish and Fish Habitat VC outlined in Section 4.2 of the dAIR.
FN-KNC-63	2015, January		Ktunaxa Nation Council	Fish	• include burbot as a sub-component within RR. Background/Rationale: Burbot is a species of exceptional importance to Ktunaxa harvesters, particularly under ice in winter. Populations are very sensitive. Different species may have different risks of entrainment in different seasons. Regarding bull trout and entrainment, a recent study on the Kinbasket Reservoir (Mica Dam) showed an increased risk of entrainment of bull trout during the fall and winter months. Some of their conclusions: "Our findings indicate that increased entrainment risk of adult bull trout in the fall and winter is related to a combination of maximization of turbine operations in these seasons with concomitant changes in behavioral attributes, such as increased residence and proximity of bull trout to the intakes (presumably for foraging on kokanee) and reduced movement (perhaps limiting escape responses to accelerating water flow) during periods of cold water temperatures. Therefore, it would be prudent to explore mitigation measures, such as operating deterrent devices (for example, strobe lights, sound, screens), to prevent bull trout from approaching and becoming entrained at hydropower intakes during the fall and winter	Burbot are a subcomponent of the Fish and Fish Habitat VC which is discussed in Section 4.2.1.2.1 of the EA. Fish harvest information specific to First Nations will be included in Part C. The Entrainment Strategy screening of species of concern concluded that kokanee were most at risk for entrainment at REV, not Bull Trout or Burbot. Mitigative measures are included in the Entrainment Strategy.		Burbot are a subcomponent of the Fish and Fish Habitat VC which is discussed in Section 4.2.1.2.1 of the EA and listed in Table 2 of Section 3.1 of the dAIR. Fish harvest information specific to First Nations will be included in Part C. The Entrainment Strategy screening of species of concern concluded that kokanee were most at risk for entrainment at REV, not Bull Trout or Burbot. Mitigative measures are included in the Entrainment Strategy. See Section 4.2 of the dAIR.
FN-KNC-64	2015, January		Ktunaxa Nation Council	Fish	• Consider the effects of erosion and sedimentation on habitat degradation. Current studies on erosion and sedimentation resulting from BCH operations should be expanded as they are currently limited in scope (i.e. number and location of sites). Background/Rationale: increased erosion and sedimentation can result in fish habitat degradation, particularly with respect to spawning habitats. Anecdotal evidence suggests there are several highly eroding sites that are not currently included in BCH monitoring programs. ***(Baseline Table)***	The risk of incremental increases in bank erosion for the Mid Columbia River reach has been assessed in the Hydrology and Fluvial Geomorphology section. Quality and quantity of habitat is an indicator under the Fish and Fish Habitat VC, and includes substrate composition and sediment concentrations.		The risk of incremental increases in bank erosion for the Mid Columbia River reach has been assessed in the Hydrology and Fluvial Geomorphology section. See Section 4.1 of the dAIR. These potential interactions are summarized in Table 3 and 4 of Appendix A in the dAIR. Quality and quantity of habitat is an indicator under the Fish and Fish Habitat VC, and includes substrate composition and sediment concentrations. See Section 4.2 of the dAIR.

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FN-KNC-65	2015, January		Ktunaxa Nation Council	Fish	BC Hydro should: • include a measure of impact to egg and larval stranding as a result of increased variation in flow due to the Project. This will be of particular importance for Sturgeon • include a measure of impact to burbot and burbot spawning behavior as a result of changes in flow or temperature due to the Project. Background/Rationale: The primary issue with sturgeon is related to egg and larval stranding due to variations in flow rates in the Columbia River. The impacts of higher peak flows in the Columbia River and seasonal timing in terms of impacts to fish and fish habitat should be considered. Please confirm the findings of any evaluation of impacts to white sturgeon spawning habitat pre and post unit 6 operations. With regards to burbot, it must be clear that water velocity and temperature should be included as a potential effect, as elevated discharge has negatively impacted burbot movements in winter. The greatest changes in velocity are likely to occur during the winter. Note that previous studies have identified that elevated winter discharges have been hypothesized to contribute to disrupting spawning migrations	BC Hydro has documented sturgeon spawning in 9 of 12 years that monitoring has occurred. In only one year were eggs observed to be dewatered. This was prior to the implementation of the minimum flows. Minimum flows have increased the wetted area, and have reduced the chance of egg stranding based on the locations where eggs were found previously. The operational regime over the past decade during the 6 or so week period of the year when sturgeon are spawning rarely sees very low flows (+ ALR backwatering), but any increased variability in flows due to REV6 is likely to influence adult spawners more than have an effect of dewatering eggs. Interestingly, from the data we modelled, it appeared that some spawning events occurred during minimum flow periods, when water velocities are 1-1.5 m/s and would appear to be ideal for sturgeon. If eggs are deposited during these lower flow periods then they are not likely to be placed in areas that would become dewatered. We have ongoing annual		The Indicator "Fish habitat quality and quantity (velocity)" for listed species and Commercial / Recreational / Aboriginal (CRA) fisheries including White Sturgeon and Burbot is listed in Table 2 of the dAIR.
FN-KNC-66	2015, January		Ktunaxa Nation Council	Fish	BC Hydro should: • include targeted collection of indigenous knowledge related to each of the key species (sub-components), and the potential effects of the Project on them from an indigenous knowledge perspective. • Use of lands and resources by Aboriginal peoples, including fishing, should be recognized as its own VC and receive its own assessment For baseline, the document states that the baseline and assessment will use available information for traditional knowledge and use. It is unclear if baseline data is adequate for all areas of cultural importance and use. ***(Baseline Table)***	Traditional Knowledge, Traditional Land Use, and current First Nation practices will be discussed in Part C of the Application.		These questions will be addressed by First Nations as they are authoring Part C.
FN-KNC-67	2015, January		Ktunaxa Nation Council	Fish	BC Hydro should: • Include a VC or sub-component that deals with (and associated metric), that deals with water levels, flow, sediment transport, and and water quality parameters. • Good to see that the assessment will look at how Project may impact salmon restoration potential. Background/Rationale: Will the ecosystem health and function VC include measures of fish habitat parameters? Has there been sufficient consideration of the potential for higher flows to cause movement/erosion of substrates? Biodiversity could be treated as per the Fording Swift Chapter C assessment, which includes examining habitat connectivity, quantity and quality of habitat for rare specie and species that are most likely to be affected by Rev6, including fish, nesting birds, amphibians, culturally important plants. The Ktunaxa Nation defines biodiversity as: maintaining the health, quantity, and variability of all living things within Ktunaxa lands and waters at levels equivalent to pre-1900 conditions. Maintaining biodiversity requires the protection of individuals, populations, species, communities and habitats including ecosystem	Fish habitat parameters are assessed in the Fish and Fish Habitat VC; specifically, water quality is an indicator, and Hydrology and Fluvial Geomorphology is an Intermediate Component. The Ecosystem Health and Function for Biodiversity subcomponent to the Ecological Communities VC will assess spatial extent of all ecosystems and habitats, including associated vegetation assemblages and wildlife; and temporal changes to habitats within an annual cycle.		Fish habitat parameters are assessed in the Fish and Fish Habitat VC; specifically, water quality is an indicator, and Hydrology and Fluvial Geomorphology is an Intermediate Component. Refer to Sections 4.1 and 4.2 of the dAIR. The fish habitat parameters are located in Table 2 of Section 3.3 in the dAIR. The Ecosystem Health and Function for Biodiversity subcomponent to the Ecological Communities VC will assess spatial extent of all ecosystems and habitats, including associated vegetation assemblages and wildlife; and temporal changes to habitats within an annual cycle. Hydrology and Fluvial Geomorphology is an Intermediate Component including water levels, flow and sediment transport (inlcuding the potential for higher flows to cause movement/erosion of substrates). Fish habitat parameters
FN-KNC-68	2015, January		Ktunaxa Nation Council	Plants	Plants should be looked at as a component of biodiversity. See definition above. ***(Baseline Table)***	Plants will be a VC. Biodiversity will be discussed within the context of Ecosystem Health and Function under Ecological Communities.		Plants will be a VC. Biodiversity will be discussed within the context of Ecosystem Health and Function under Ecological Communities. Section 4.4 and 4.3 of the dAIR.
FN-KNC-69	2015, January		Ktunaxa Nation Council	Rare and sensitive eco-systems	BC Hydro should: • Rephrase this VC as 'Rare and Sensitive or Culturally Important Ecosystems'. Sub-component should include culturally important ecosystems (defined by occurrence of plants and animals of cultural importance) that may be impacted, but are rare or hard to find elsewhere within the territories of involved First Nations. ***(Baseline Table)***	Culturally important species and ecosystems will be identified in Part C of the EA.		
FN-KNC-7	2015, January		Ktunaxa Nation Council	Hydrology and River Behaviour	<u>Hydrology and River Behaviour:</u> • A section should be added to include a description of hydrologic and river behaviour conditions before Revelstoke 5 and immediately after, in order to anticipate incremental changes to the Middle Columbia River. This will be important for reducing uncertainty, planning restoration and/or mitigations for specific changes to hydrology and river behavior as well as fisheries, safety of river users and other issues of importance to the Ktunaxa. • Please provide information on the condition of the river prior to regulation of the river (a pre-development baseline). • It would be useful to undertake a study on how reservoir levels and MCR channels have changed over time (retrospective study using aerial photographs from pre-Revelstoke Dam), how these changes have influenced indigenous use of the river and whether actual impacts are within the bounds of what was predicted for Rev 5.	The REV 5 EA study conducted by NHC provided an assessment of the geomorphic and sediment transport impacts of the Project at the time, including a review of air photos pre and post regulation. Limited predevelopment data is available, and pre-development assessments have not been completed.		The REV 5 EA study conducted by NHC provided an assessment of the geomorphic and sediment transport impacts of the Project at the time, including a review of air photos pre and post regulation. Limited predevelopment data is available, and pre-development assessments have not been completed. See Section 4.1 (Hydrology and Fluvial Geomorphology) of the dAIR. How the changes have influenced indigenous use would be provided by the First Nations in Part C, and, and assessment of "REV 5 actual vs predicted" has been provided to First Nations (see line 32 above)

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FN-KNC-70	2015, January		Ktunaxa Nation Council	Rare and sensitive eco-systems	BC Hydro should: • include targeted collection of indigenous knowledge related to each ecosystem, and the potential effects of the Project on them from an indigenous knowledge perspective. • Use of lands and resources by Aboriginal peoples, including a sub-component of culturally important plants and ecosystems, should be recognized as its own VC and receive its own assessment ***(Baseline Table)***	Culturally important species and ecosystems will be identified in Part C of the EA.		
FN-KNC-71	2015, January		Ktunaxa Nation Council	Rare and sensitive eco-systems	BC Hydro should: • include a specific measure related to bioaccumulation of mercury or other contaminant issues, including psycho-social or perceived contamination or tainting of wild foods, potentially influenced by the Project. ***(Baseline Table)***	We will evaluate whether there is currently an issue with mercury or other bioaccumulative materials associated with the dam. It is not expected that the proposed project will affect issues related to bioaccumulation or mercury.		The project will not result in water levels outside existing operating ranges, and therefore will not affect the bioaccumulation of mercury or other potential contaminants. The project itself has no introduced potential sources of mercury. A brief discussion of this is provided in the Human Health Section (8.2) of the Application.
FN-KNC-72	2015, January		Ktunaxa Nation Council	Birds	BC Hydro should: • include a measure of impact to culturally important bird species as a result of the Project. Background/Rationale: Culturally important birds should be included. Results from existing studies indicate that most affected species (wrt productivity) are some waterfowl (mallard, teal spp, American Widgeon); some shore birds; short-eared owls. It would be interesting to see the results of any post-construction monitoring that was done for Rev 5, to see what the impacts were to nesting birds due to increases in river elevations. Note: through reading the communications pieces for the Columbia River WUP, it appears that little in the way of before Rev 5/ after Rev 5 comparisons have been made. The 2014 Columbia River WUP communications piece indicates that reservoir operations have a negative influence on most ground-nesting waterfowl due to nest flooding impacts. Given that monitoring occurs, it should be easy to set acceptable thresholds for impacts. Right now, soft targets are used but they seem to be often exceeded. ***(Baseline Table)***	Potential effects on birds including some species of cultural importance are discussed in Section 4.6 of the EA. Further discussion of culturally important birds will be included in Part C. Studies pertaining to the impacts of Rev 5 on nesting birds have been included in the baseline.		Potential effects on birds including some species of cultural importance are discussed in Section 4.6 of the Application. Further discussion of culturally important birds will be included in Part C. Studies pertaining to the impacts of Rev 5 on nesting birds have been included in the baseline. See Section 4.6.2 in the dAIR. Consideration of potential effects of the project, proposal of avoidance / management or mitigation measures, assessment of residual effects, cumulative effects assessment, and development of follow-up strategy are set out in Sections 4.6.3 through 4.6.7 of the dAIR. The significance and confidence in assessed residual effects on birds, will be evaluated based on the characterization criteria, existing knowledge, effectiveness of proposed
FN-KNC-73	2015, January		Ktunaxa Nation Council	Birds	BC Hydro should: • include targeted collection of indigenous knowledge related to each of the key species (sub-components), and the potential effects of the Project on them from a indigenous knowledge perspective. ***(Baseline Table)***	Traditional Knowledge, Traditional Land Use, and current First Nation practices will be discussed in Part C of the Application.		
FN-KNC-74	2015, January		Ktunaxa Nation Council	Birds	• Use of lands and resources by Aboriginal peoples, including hunting of birds, should be recognized as its own VC and receive its own assessment ***(Baseline Table)***	The Land and Resource Use VC assessment will consider Project-related effects on First Nations. Additional information related to use of lands and resources by Aboriginal peoples will be included in Part C of the Application.		
FN-KNC-75	2015, January		Ktunaxa Nation Council	Birds	See comments re. biodiversity and fish above. An appropriate metric for biodiversity wrt bird populations should be developed. Ongoing monitoring of bird populations, including reproductive success, should be included. ***(Baseline Table)***	BC Hydro will review existing information from the WUP studies (e.g., CLBMON 36, 39, 40) to address abundance and distribution of known occurrences of bird species, as well as abundance, distribution and quality of known suitable habitat for bird species (based on the WUP studies). The WUP studies address reproductive success of target species.		BC Hydro will review existing information from the WUP studies (e.g., CLBMON 36, 39, 40) to address abundance and distribution of known occurrences of bird species, as well as abundance, distribution and quality of known suitable habitat for bird species (based on the WUP studies). The WUP studies address reproductive success of target species. The list of indicators for the Bird VC are described in Table 2, Section 3.1. Requirements for the assessment of birds is outlined in Section 4.6 of the dAIR. Monitoring or other mitigation measures for VCs identified based on the effects assessment will be identified, where appropriate, in the Application.
FN-KNC-76	2015, January		Ktunaxa Nation Council	Herptiles	Background/Rationale: summary says that the biological significance of any effect on amphibian populations is unknown and difficult to assess. A long-term amphibian monitoring program and associated habitat compensation would be appropriate. Note that the preliminary work done for the Columbia River WUP suggests that amphibians are negatively affected by dam operations: as reservoir elevations increased throughout the season, the total amount of available habitat decreased and some wetlands were flooded, affecting primarily western toads (from Rev 5 milestones document). Note that the Rev 5 Project review expressed concerns about the timing of influxes of cold water and how that may affect development of amphibians ***(Baseline Table)***	Acknowledged. Applicable studies (including those related to soft constraints) will be reviewed for baseline information (e.g., CLBMON 37, 38, 11B3).		Acknowledged. Applicable studies (including those related to soft constraints) will be reviewed for baseline information (e.g., CLBMON 37, 38, 11B3). See Section 16 (References) of the dAIR.
FN-KNC-77	2015, January		Ktunaxa Nation Council	Herptiles	BC Hydro should: • include targeted collection of indigenous knowledge related to each of the key species (amphibians), and the potential effects of the Project on them from a indigenous knowledge perspective. ***(Baseline Table)***	"Traditional Use and Knowledge" will be included based on information provided by First Nations communities or First Nations co-ordinators.		"Traditional Use and Knowledge" is included based on information provided by First Nations communities or First Nations co-ordinators. See Section 3.3 of the dAIR and each VC.

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FN-KNC-78	2015, January		Ktunaxa Nation Council	Mammals	BC Hydro should: • add a furbearer, preferably culturally important and water level dependent (e.g. beaver or muskrat), to the list of VCs. ***(Baseline Table)***	Furbearers are included in the Mammals VC and have been included in Section 4.7 of the EA. Further discussion of culturally important furbearing species will be included in Part C.		Sorry, cannot find line 132. Please clarify with comment number identified in Column A. Within the Mammals Section (Section 4.7 of the EA) the sub-components include Mammal Species at Risk, Ungulates, and Traditional Use and Knowledge (species specifically identified by Aboriginal Groups that are of cultural or economic importance). Within the Traditional Use and Knowledge sub-component furbearers have been identified and a list of the species (17 in total) known or likely to occur within the Generation LSA is provided in Table 4.7-7 (found in the Description of Existing Conditions). Some of these furbearer species listed in Table 4.7-7 primarily use upland forested habitats and would rarely be found in the draw down zone. Species on the list that are closely associated with aquatic and shoreline habitats
FN-KNC-79	2015, January		Ktunaxa Nation Council	Mammals	BC Hydro should: • include targeted collection of indigenous knowledge related to each of the key species (mammals), and the potential effects of the Project on them from a indigenous knowledge perspective. • Use of lands and resources by Aboriginal peoples, including hunting or trapping of mammals, should be recognized as its own VC and receive its own assessment. Background/Rationale: Has there been good documentation of the effects of the existing dam on ungulate species? Establishing a baseline for traditional knowledge and use that extends prior to the initial building of the Revelstoke Dam would be appropriate. ***(Baseline Table)***	The Land and Resource Use VC assessment will consider Project-related effects on First Nations. Additional information related to use of lands and resources by Aboriginal peoples will be included in Part C of the Application.		The Land and Resource Use VC assessment (Section 6.3 of the dAIR) will consider Project-related effects on First Nations. Additional information related to use of lands and resources by Aboriginal peoples will be included in Part C of the Application.
FN-KNC-8	2015, January		Ktunaxa Nation Council	Project Land Use	<u>Project Land Use:</u> Will this section discuss existing First Nations land use plans and use areas, as well as existing agreements with First Nations, where relevant?	First Nation Land Use information will be included in the Land and Resource Use VC; includes review of Land and Resource Use. In addition, further information will be provided in Part C.		First Nation Land Use information is included in Part C.
FN-KNC-80	2015, January		Ktunaxa Nation Council	Economy	BC Hydro should: • include a specific measure of direct revenues, direct and indirect employment, training and capacity building, and amount of procurement anticipated for each First Nation due to the addition of a 6th generator. • Include a baseline discussion addressing if economic, training, and employments targets for First Nations have been met for Revelstoke 5 and Mica? If not, why not? • include a specific assessment of economic effects anticipated for each First Nation due to the addition of a 6th generator ***(Baseline Table)***	Information regarding employment levels at the local, regional, and First Nation levels, including the number of First Nation hires on the Rev 5 Project, are provided in Section 5.2 of the EA. Information describing the length of employment for these employees is not available. Measures to enhance First Nation opportunities at the Rev6 project in light of the experience at Rev 5 are also included in the EA. Project-related opportunities training, capacity building, procurement for First Nations will be directly discussed with BC Hydro. Where appropriate, information from Part C will be integrated and cross-referenced throughout the Part B Economy and Socio-community Sections following receipt of Part C.		Information regarding employment levels at the local, regional, and First Nation levels, including the number of First Nation hires on the Rev 5 Project, is described in the EA. Information describing the length of employment for these employees is not available. Measures to enhance First Nation opportunities at the Rev6 project in light of the experience at Rev 5 and Mica 5/6 projects are also included in the EA. This is outlined in Section 5.2 of the dAIR. Project-related opportunities training, capacity building, procurement for First Nations will be directly discussed with BC Hydro. Where appropriate, information from Part C will be integrated and cross-referenced throughout the Part B Economy and Socio-community Sections following receipt of Part C.
FN-KNC-81	2015, January		Ktunaxa Nation Council	Socio-community	BC Hydro should: • include a set of specific measures and targets related to social impacts, for each First Nation due to the addition of a 6th generator • include a specific assessment of social effects anticipated for each First Nation due to the addition of a 6th generator (***Baseline Table)***	Where information is available including information presented in Part C of the EAC Application, the Socio-community VC assessment will reflect existing conditions and consider Project-related socio-community effects on Aboriginal groups. The Socio-community VC assessment includes assessment of potential Project effects on the above Aboriginal Groups, taking into consideration information presented by these Aboriginal Groups in Part C.		Specific targets and measures are provided in Section 6.2 of the dAIR. Where information is available including information presented in Part C of the EAC Application, the Socio-community VC assessment will reflect existing conditions and consider Project-related socio-community effects on Aboriginal groups. The Socio-community VC assessment includes assessment of potential Project effects on the above Aboriginal Groups, taking into consideration information presented by these Aboriginal Groups in Part C.
FN-KNC-82	2015, January		Ktunaxa Nation Council	Land Use	BC Hydro should: • include a set of specific measures and targets related to impacts on recreation, tourism, and resource use relevant to each First Nation due to the addition of a 6th generator ***(Baseline Table)***	Project-related impacts to recreation, resource use, and tourism will be considered in the Social and Economic Effects Sections of the EA. Specific measures and targets related to impacts on recreation, tourism, and resource use for First Nations will be generated based on information provided by First Nations, and will be discussed in Part C.		Project-related impacts to recreation, resource use, and tourism will be considered in the Social and Economic Effects Sections of the EA. See Section 6.2 of the dAIR. Specific measures and targets related to impacts on recreation, tourism, and resource use for First Nations will be generated based on information provided by First Nations, and will be discussed in Part C.

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FN-KNC-83	2015, January		Ktunaxa Nation Council	Heritage and archaeology	BC Hydro should: • include a set of specific measures and targets related to potential shoreline or in-stream erosion that may impact nearby or underwater archaeological sites and that may be due to the addition of a 6th generator • include targeted collection of indigenous knowledge related to heritage and past use, and the potential effects of the Project on heritage and archaeology from an indigenous knowledge perspective. Background/Rationale: Table notes recommendation that an archeological inventory of both Kinbasket and Revelstoke reservoirs should be undertaken. See Core Committee Report for the Rev Unit 5 Project Consultative Process. It is important to clarify the current baseline and determine how well monitoring of impacts to archeological sites was done for Rev 5. ***(Baseline Table)***	The EA includes measures specific to the potential effects of erosion and water level fluctuations on heritage and archaeology sites in the MCR. Information provided by First Nations has been considered in the Heritage and Archaeology VC. Traditional Knowledge, Traditional Land Use, and current First Nation practices will be discussed in Part C of the Application.		The EA includes measures specific to the potential effects of erosion and water level fluctuations on heritage and archaeology sites in the MCR. See Section 7.2 of the dAIR. Information provided by First Nations has been considered in the Heritage and Archaeology VC. Traditional Knowledge, Traditional Land Use, and current First Nation practices will be discussed in Part C of the Application.
FN-KNC-84	2015, January		Ktunaxa Nation Council	Heritage and archaeology	BC Hydro should: • include a set of specific measures and targets related to potential shoreline or in-stream erosion that may impact near shore or underwater archaeological sites and that may be due to the addition of a 6th generator • include targeted collection of indigenous knowledge related to heritage and past use, and the potential effects of the Project on heritage and archaeology from an indigenous knowledge perspective. Background/Rationale: HA17: In 1994 Wayne Choquette prepared an impact study for the Revelstoke Unit 5 Project. This study focused on the area along the Columbia River below Revelstoke Dam in the area where projected increase in water level fluctuation due the fifth unit was anticipated. One archaeological site was located during this study, one area where artifacts were previously found along with several possible rock shelters were also identified. ***(Baseline Table)***	For the Mid-Columbia Reach portion of the Rev 6 Project we will be relying on measures that were included in the CLBMON-50 wind and wave erosion monitoring study. The development of the CLBMON-50 five year study was due to recommendations made during the Columbia River Water Use Planning process. These recommendations included an Addendum to the Water Use Plan to add additional terms and conditions to address incremental impacts of the operation of a fifth generating unit at Revelstoke Dam. Measures for the CLBMON-50 study include: distance and direction monitoring points moved, indicating whether or not monitoring points could be found year to year, and erosion or accumulation of sediments at monitoring stations. The last year of fieldwork for the CLBMON-50 Study was in 2014. Results of CLBMON50 Study are currently being prepared and will be distributed to First Nations and discussed further during Archaeological Heritage Workshops. BC Hydro will include		Indicators are provided in Table 2, Section 3.1 of the dAIR. For the Mid-Columbia Reach portion of the Rev 6 Project we will be relying on measures that were included in the CLBMON-50 wind and wave erosion monitoring study. The development of the CLBMON-50 five year study was due to recommendations made during the Columbia River Water Use Planning process. These recommendations included an Addendum to the Water Use Plan to add additional terms and conditions to address incremental impacts of the operation of a fifth generating unit at Revelstoke Dam. Measures for the CLBMON-50 study include: distance and direction monitoring points moved, indicating whether or not monitoring points could be found year to year, and erosion or accumulation of sediments at monitoring stations. The last year of fieldwork for the CLBMON-50 Study was in 2014. Results of CLBMON50
FN-KNC-85	2015, January		Ktunaxa Nation Council	Heritage and archaeology	BC Hydro should: 1) Consider including intangible cultural heritage values (including place names, transmission of knowledge) under First Nations Governance or similar in part c, and remove it from part b: Heritage 2) Include use of lands and resources by Aboriginal peoples, including habitation, cultural sites, and transportation values, as its own VC with its own assessment in part c 3) Remove "locations where First Nation's Activities took place" from this section, as it will be covered by the new VC of "Use of Lands and Resources by Aboriginal Peoples", including past, present and future use. Background/Rationale: Table states that baseline data will be extracted from previous studies, including HA20 (TUS for Rev 5) and HA21 (TUS for Mica 5/6 EA). Existing information may, or may not, be adequate for assessment purposes. The KNC is developing an overall TUS strategy and does not support work which is conducted without their knowledge or in a way that does not meet the criteria in their strategy. If TUS work is conducted, the KNC will lead the process for Ktunaxa citizens in order to ensure that the	1) The Heritage and Archaeology candidate VC has been split into 'First Nations Cultural Heritage' and 'Historical and Archaeological Heritage'. Governance has been removed from Part B and is now included in Part C. 2) Agreed. 'First Nations Cultural Heritage', including use of lands and resources by Aboriginal peoples (such as habitation, cultural sites, and transportation values) will be assessed by First Nations in Part C of the EA. 3) Agreed.		
FN-KNC-86	2015, January		Ktunaxa Nation Council	Health	BC Hydro should: • include a set of specific measures and targets related to changes in air quality (especially potential for air-borne dust as a result of reservoir fluctuation), and changes in quality of wild foods and fish, with a focus on mercury accumulation within the reservoir as a result of addition of a 6th generator ***(Baseline Table)***	An assessment of air quality and a discussion of mercury and their potential effects on food and fish will be included in the EA.		An assessment of air quality and a discussion of mercury and their potential effects on food and fish will be included in the EA. See Section 4.1.4 Air Quality and Noise and Section 8 Human Health of the dAIR.
FN-KNC-87	2015, January		Ktunaxa Nation Council	First Nations	BC Hydro should: • include a set of specific measures and targets related to First Nations governance, including contribution or impairment of established First Nation stewardship or planning goals as a result of the Project, and progress towards, or achievement of, FPIC. ***(Baseline Table)***	Governance has been removed from Part B and is now included in Part C.		

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NO	DATE	COMMENTS ORIGINATED		Topic Subject	Comments	RESPONSE	If unsatisfactory - Comments	Responses
		Name	Affiliation			What		
FN-KNC-88	2015, January		Ktunaxa Nation Council	First Nations	BC Hydro should: • Include use of lands and resources by Aboriginal peoples as its own VC with its own assessment. • Consider including intangible cultural heritage values (including place names, transmission of knowledge) under this VC or similar Background/Rationale: Impacts on First Nation ability to harvest (as through ice in winter) requires a different assessment endpoint than impacts to a particular resource (such as fish populations). It may then be possible to exclude "Locations where First Nation's activities took place (i.e., cultural heritage sites)" from part b under Heritage and have it covered under this VC. This VC would be in part c and would encompass past, present and future use of lands and resources. (Baseline Table)	Use of lands and resources by Aboriginal peoples will be assessed by First Nations in Part C of the EA. Part C will also address intangible cultural heritage values.		
FN-KNC-89	2015, January		Ktunaxa Nation Council	Heritage Resources	The Ktunaxa Nation will be using their own traditional use and other data to make their own assessments as to impacts to intangible cultural heritage within part c.	The Heritage and Archaeology candidate VC has been split into 'First Nations Cultural Heritage' and 'Historical and Archaeological Heritage'. 'First Nations Cultural Heritage' section will be assessed by First Nations in Part C of the Application.		Yes, the Ktunaxa Nation will be using their own data as they are authors of Part C.
FN-KNC-9	2015, January		Ktunaxa Nation Council	Methodological Guidance	• The diagram outlining the methods used for the environmental assessment does not suggest including a pre-development baseline. A pre-development baseline, including a description of conditions before the dam, as well as after the main construction and before Rev 5, should be included ongoing trends of impact especially to aboriginal use and how Rev 6 may reinforce those trends. A strong sense of pre-development conditions will also provide a basis for reclamation and management goals that Rev 6 should aim for in order to support hydrologic patterns and riparian ecosystems similar to pre-development	Pre dam conditions are discussed for the VCs in the draft Application as they contribute to the overall understanding of the VCs context.		Pre dam conditions are discussed for the VCs in the draft Application as they contribute to the overall understanding of the VCs context. The existing conditions are provided for each VC, this is described in Section 3.3 of the dAIR.
FN-LSLIB-1	2015, January		Little Shuswap Lake IB	Other	In addition, the development of the dAIR has been informed by the BC Hydro's Core Committee process, which has brought together federal, provincial, and local government agencies, First Nations, and stakeholders to discuss, provide input and make recommendations associated with the Project. Consultation with First Nations occurs through a separate, formal process.	Agreed. While the Core Commitee provides a forum for information exchange it does not replace FN Consultation.		
FN-LSLIB-10	2015, January		Little Shuswap Lake IB	Other	The Application will include a summary of the consultation activities undertaken with the identified First Nations potentially affected by the proposed project (as identified in the Section 11 Order) including the information listed at parts 3.2.1 and 3.2.2 below. The notification and consultation activities will comply with the Public Consultation Policy Regulation (B.C. Reg. 373/2002) under BCEAA and will be undertaken in accordance with the consultation provisions of the Section 11 Order.[Statement needed that clarifies that the intent of participation by First Nations in the Core Committee and related sub-committees does not replace the requirement for a distinct and separate consultation process]	Agreed: The Province of British Columbia has a duty to consult and where required, accommodate First Nations whenever a decision or activity could impact Treaty rights or asserted or established Aboriginal Rights and Title. The Povince has delegated the procedural aspects of the Rev 6 consultation to BC Hydro. While the Core Commitee provides a forum for information exchange it does not replace FN Consultation.		Agreed: The Province of British Columbia has a duty to consult and where required, accommodate First Nations whenever a decision or activity could impact Treaty rights or asserted or established Aboriginal Rights and Title. The Province has delegated the procedural aspects of the Rev 6 consultation to BC Hydro. While the Core Commitee provides a forum for information exchange it does not replace FN Consultation.
FN-LSLIB-11	2015, January		Little Shuswap Lake IB	First Nation Consultation	. To-date, the Core Committee has been an important mechanism for consultation related to the Project. [specify 'non-First Nations' consultation]	The Core Commitee is a forum for information exchange and advice. First Nations participation in the Core Committee does not replace First Nation Consultation		
FN-LSLIB-13	2015, January		Little Shuswap Lake IB		* Locations of the plants and how close they are to rising water levels and if at risk	Hydraulic modelling will assess the effects of changes in inundation on terrestrial environments.		Hydraulic modelling will assess the effects of changes in inundation on terrestrial environments. See Section 4.4 of the dAIR for an outline of the requirements.
FN-LSLIB-14	2015, January		Little Shuswap Lake IB	Mammals	Ungulates (moose, mule deer) and Caribou	A discussion of effects of REV6 on Caribou is included in the EA.		A discussion of effects of REV6 on Caribou is included in the EA. Table 2, Section 3.1 has been updated. Also, see Section 4.7 of the dAIR. Moose and mule deer are indicated as Ungulates of interest in Table 2 of Section 3.1 of the dAIR.
FN-LSLIB-15	2015, January		Little Shuswap Lake IB		* Impacts to Caribou populations in the area, both in short and long term	A discussion of effects of REV6 on Caribou is included in the EA.		A discussion of effects of REV6 on Caribou is included in the EA. Table 2, Section 3.1 has been updated. Also, see Section 4.7 of the dAIR.
FN-LSLIB-16	2015, January		Little Shuswap Lake IB	Rephrasing	Consistency with stewardship and Land and Resource Use planning objectives. [add: 'and Land Use']	Application will consider FN Land Use - specific assessment likely in Part C.		Application will consider FN Land Use - specific assessment to be included in Part C.
FN-LSLIB-17	2015, January		Little Shuswap Lake IB	Land and Resource Use	Levels of harvest and users. [see also Cultural Heritage VC and associated sub-components]	This information will be included in Part C.		

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FN-LSLIB-18	2015, January		Little Shuswap Lake IB	Cultural Heritage	Locations with protected archaeological or historical sites, features and artifacts [this sub-component should clarify that 'Archaeology' includes landforms and landscapes, not just sites as defined under the Heritage Conservation Act]	This was completed. VC subcomponent description now states the following: Locations with protected archaeological or historical heritage sites, landscapes, landforms, features, stratigraphy, and artifacts		
FN-LSLIB-19	2015, January		Little Shuswap Lake IB	Cultural Heritage	Locations where First Nations activities took place (i.e., cultural heritage sites) [this sub-component should clarify that Cultural Heritage as for Archaeology includes sites, landforms and landscapes not covered under the BC CHA]	These comments will be addressed in the 'First Nations Cultural Heritage' section in Part C.		
FN-LSLIB-2	2015, January		Little Shuswap Lake IB	Other	Agencies, First Nations, and stakeholders involved in the development of the dAIR include: Shuswap Nation Tribal Council (SNTC): Adams Lake, Bonaparte, Kamloops, Little Shuswap, Neskonlith, Shuswap, Simpcw, Skeetchestn, Splatsin, Whispering Pines; [Shouldn't only the Bands who are actively participating in the review be listed? The current list is misleading as it shows all Bands who are currently members of the SNTC - Little Shuswap is NOT currently an SNTC member]	BC Hydro will be guided by the Section 11 Order in determining the inclusion of specific First Nations in the Enviromental Assessment		
FN-LSLIB-20	2015, January		Little Shuswap Lake IB	Cultural Heritage	Measurable disturbance or loss of elements essential to the preservation or character of cultural heritage sites, landforms or landscapes.	First Nations Cultural Heritage will be assessed in Part C of the Application. Subcomponents wil include landforms and landscapes.		
FN-LSLIB-21	2015, January		Little Shuswap Lake IB	Rephrasing	3. Hugh Keenleyside Dam and its effect on Arrow Reservoir [This needs to include all associated access roads, transmission lines, capacitor stations and other associated infrastructure}	Section 4.10 Cumulative Effects, page 25: The Rev 6 environmental assessment process will take into consideration the hydrological effects of Hugh Keenleyside Dam and the operation of Arrow Reservoir. Hugh Keenleyside infrastructure effects won't be included unless there is an interaction with the Project effects.		Section 4.10 Cumulative Effects, page 25: The Rev 6 environmental assessment process will take into consideration the hydrological effects of Hugh Keenleyside Dam and the operation of Arrow Reservoir. Hugh Keenleyside infrastructure effects won't be included unless there is an interaction with the Project effects. See Section 3.10 of the dAIR
FN-LSLIB-22	2015, January		Little Shuswap Lake IB	Climate Change	Add : • Impact of climate change using various models	Climate change is discussed in Section 10 of the EA.		Updated in Section 4.1 of the dAIR
FN-LSLIB-23	2015, January		Little Shuswap Lake IB	Fish	• Commercial, Recreational and Aboriginal fisheries (CRA), as defined in the *Fisheries Act* . Does not include federal/provincial listed species above (e.g., mountain whitefish, rainbow trout, burbot, kokanee); and [why are Aboriginal fisheries lumped in here? These include all fish species list under both bullets and others not listed	CRA is a definition in the Fisheries Act which is a regulatory requirement. This bullet is meant to include all those species that are not listed as species at risk (i.e., species other than sturgeon and bull trout). The three categories taken together should encompass the existing fish community.		CRA is a definition in the Fisheries Act which is a regulatory requirement. This bullet is meant to include all those species that are not listed as species at risk (i.e., species other than sturgeon and bull trout). The three categories taken together should encompass the existing fish community. Additional information pertaining to Aboriginal Fisheries will be provided in Part C.
FN-LSLIB-24	2015, January		Little Shuswap Lake IB	Fish	Traditional Use and Knowledge [including but not limited to: anadromous fish species (future re-introduction) including sockeye salmon, chinook salmon, coho salmon, steelhead trout}	Fish resources, including salmon, are discussed in Section 4.2.2.2.3 of the EA. Further information on Traditional Use and Knowledge will be included in Part C.		Fish resources, including salmon, are discussed in Section 4.2.2.2.3 of the EA. Further information on Traditional Use and Knowledge will be included in Part C. Examples of fish species are included in 4.2 of the dAIR and the VC document.
FN-LSLIB-25	2015, January		Little Shuswap Lake IB	Rephrasing	• Knowledge provided by First Nations, including historical information, oral history and Aboriginal Technical Knowledge.	Information provided by First Nations will be included in Part B of the EA. Additionally, Part C will be authored by First Nations, and will include Traditional Use and Knowledge.		Text updated to read 'Traditional Knowledge (e.g. historical information, oral history and Aboriginal technical Knowledge) and current Aboriginal practices'. Information provided by First Nations will be included in Part B of the EA. Additionally, Part C will be authored by First Nations, and will include Traditional Use and Knowledge.
FN-LSLIB-26	2015, January		Little Shuswap Lake IB	Rephrasing	• Information provided by First Nations communities or First Nations coordinators, including historic information on changes in plant distribution over time due to climate change.	Climate change is discussed in Section 10 of the EA. Information provided by First Nations will be included in Part B of the EA. Additionally, Part C will be authored by First Nations, and will include Traditional Use and Knowledge.		Information provided by First Nations will be included in Part B of the Application. Additionally, Part C will be authored by First Nations, and will include Traditional Use and Knowledge. Traditional Use and Knowledge (species specifically identified Aboriginal Groups) is an Indicator for all VCs, as outlined in Table 2 of the dAIR.
FN-LSLIB-27	2015, January		Little Shuswap Lake IB	Climate Change	Add: • Impacts of climate change on habitat distribution for culturally important species.	Climate change is discussed in Section 10 of the EA. Information provided by First Nations will be included in Part B of the EA. Additionally, Part C will be authored by First Nations, and will include Traditional Use and Knowledge.		Information provided by First Nations will be included in Part B of the EA. Additionally, Part C will be authored by First Nations, and will include Traditional Use and Knowledge. Traditional Use and Knowledge (species specifically identified Aboriginal Groups) is an Indicator for all VCs, as outlined in Table 2 of the dAIR.
FN-LSLIB-28	2015, January		Little Shuswap Lake IB	Rephrasing	• Traditional knowledge and current First Nation practices.	Accepted. Changed to Traditional knowledge and currentAboriginal practices		
FN-LSLIB-29	2015, January		Little Shuswap Lake IB	Rephrasing	• Traditional knowledge and current First Nation practices.	Accepted. Changed to Traditional knowledge and currentAboriginal practices		

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FN-LSLIB-3	2015, January		Little Shuswap Lake IB	Other	• Nicola Tribal Association (NTA): Nooaitch Indian Band, Nicomen Indian Band, Shackan Indian Band, Siska Indian Band, Coldwater Indian Band, Cook's Ferry Indian Band; [are these Bands actually involved or should they be listed as 'notification only'?]	BC Hydro will be guided by the Section 11 Order in determining the inclusion of specific First Nations in the Enviromental Assessment		
FN-LSLIB-30	2015, January		Little Shuswap Lake IB	Rephrasing	• Traditional knowledge and current First Nation practices.	Accepted. Changed to Traditional knowledge and currentAboriginal practices		
FN-LSLIB-31	2015, January		Little Shuswap Lake IB	Rephrasing	• Traditional knowledge and current First Nation practices.	Accepted. Changed to Traditional knowledge and currentAboriginal practices		
FN-LSLIB-32	2015, January		Little Shuswap Lake IB	Climate change	Add: • Impacts of climate change on habitat distribution for culturally important species.	Climate change is discussed in Section 10 of the EA. Information provided by First Nations will be included in Part B of the EA. Additionally, Part C will be authored by First Nations, and will include culturally important species.		Information provided by First Nations will be included in Part B of the EA. Additionally, Part C will be authored by First Nations, and will include culturally important species.
FN-LSLIB-33	2015, January		Little Shuswap Lake IB	Rephrasing	• Local Government and First Nation Finances; and	FN finances will be included where provided by First Nations.		
FN-LSLIB-34	2015, January		Little Shuswap Lake IB	Rephrasing	Local government and First Nation expenditures and revenues	FN expenditures will be included where provided by First Nations.		
FN-LSLIB-35	2015, January		Little Shuswap Lake IB	Rephrasing	Provide a description and associated map(s) of the spatial and temporal boundaries for the assessment of economic effects, including applicable administrative and jurisdictional (including First Nation Territorial) boundaries	Maps of FN Territorial boundaries are included in Part A.		Maps of FN Territorial boundaries are included in Part A as required in Section 1.1 of the dAIR.
FN-LSLIB-36	2015, January		Little Shuswap Lake IB	Rephrasing	• Traditional knowledge and current First Nation practices.	Accepted. Changed to Traditional knowledge and currentAboriginal practices		
FN-LSLIB-37	2015, January		Little Shuswap Lake IB	Rephrasing	The sources of information will include, but are not limited to, local and regional employment agencies, business associations, Regional First Nation Corporate entities, hotels and motel, alternative accomm	Format has been changed and this paragraph has been removed.		
FN-LSLIB-38	2015, January		Little Shuswap Lake IB	Rephrasing	• Traditional knowledge and current First Nation practices.	Accepted. Changed to Traditional knowledge and currentAboriginal practices		
FN-LSLIB-39	2015, January		Little Shuswap Lake IB	Rephrasing	• Traditional knowledge and current First Nation practices.	Accepted. Changed to Traditional knowledge and currentAboriginal practices		
FN-LSLIB-4	2015, January		Little Shuswap Lake IB		• Nlakapamux Nation Tribal Council (NNTC): Lytton First Nation, Oregon Jack Creek Band, Ashcroft Indian Band, Boothroyd Indian Band, Boston Bar First Nation, Skuppah Indian Band, Spuzzum First Nation; [as above]	BC Hydro will be guided by the Section 11 Order in determining the inclusion of specific First Nations in the Enviromental Assessment		
FN-LSLIB-40	2015, January		Little Shuswap Lake IB	Rephrasing	… Revelstoke municipal land use plans, lands of interest to First Nations and First Nation Land Use Plans, and lands for traditional uses	Agreed-response should be udpated based on what lanaguage is adopted.		VC document was not updated, however,First Nations Land Use Plans were considered in the assessment to insure consistency with government land use designations and land use plan objectives and policies. Section 6.3 Land and Resource Use
FN-LSLIB-41	2015, January		Little Shuswap Lake IB	Rephrasing	• Introduce the assessment for land and resource use, including recreation, viewscapes, cultural landscapes, agriculture, parks and conservation areas, and land tenure;	Information pertaining to Cultural Landscape will be provided in Part C.		
FN-LSLIB-42	2015, January		Little Shuswap Lake IB	Rephrasing	The Application will provide a general description of the existing heritage cultural heritage context and resources/values in the areas surrounding the Project. The VCs, sub components and indicators associated with the cultural heritage effects will be described in the subsequent sections.	The Heritage and Archaeology candidate VC has been split into 'First Nations Cultural Heritage' and 'Historical and Archaeological Heritage'. 'First Nations Cultural Heritage' section will be assessed by First Nations in Part C of the Application.		
FN-LSLIB-43	2015, January		Little Shuswap Lake IB	Rephrasing	The assessment of archaeology and historical cultural heritage resources protected under the Heritage Conservation Act (HCA) as well as other cultural resources and values not recognized under the HCA will be based on existing and available information, including studies carried out for the assessment of the Revelstoke Unit 5 Project and associated post construction monitoring studies, and studies carried out in relation to the Columbia River Project Water Use Plan, and studies carried out under BC Hydro's Reservoir Archaeology Program (RAP). The assessment of intangible cultural heritage resources will be based on relevant background available literature, existing and available Traditional Use Studies data, and additional knowledge provided by First Nations.	The Heritage and Archaeology candidate VC has been split into 'First Nations Cultural Heritage' and 'Historical and Archaeological Heritage'. First Nations will assess 'First Nations Cultural Heritage' in Part C of the Application, which will address these comments. The 'Historical and Archaeological Heritage' has been revised to include the following: "The assessment of archaeology and historical resources protected under the Heritage Conservation Act (HCA) will be based on existing and available information, including studies carried out for the assessment of the Revelstoke Unit 5 Project and associated post construction monitoring studies, and studies carried out in relation to the Columbia River Project Water Use Plan, and studies carried out under BC Hydro's Reservoir Archaeology Program (RAP). "		The Heritage and Archaeology candidate VC has been split into 'First Nations Cultural Heritage' and 'Historical and Archaeological Heritage'. First Nations will assess 'First Nations Cultural Heritage' in Part C of the Application, which will address these comments. The 'Historical and Archaeological Heritage' has been revised to include the following: "The assessment of archaeology and historical resources protected under the Heritage Conservation Act (HCA) will be based on existing and available information, including studies carried out for the assessment of the Revelstoke Unit 5 Project and associated post construction monitoring studies, and studies carried out in relation to the Columbia River Project Water Use Plan, and studies carried out under BC Hydro's Reservoir Archaeology Program (RAP). " See Section 7.2 of

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FN-LSLIB-44	2015, January		Little Shuswap Lake IB	Rephrasing	Sub-components of the Heritage and Archaeology Cultural Heritage VC for all project areas include: -Locations with protected archaeological or cultural sites, features and artifacts; -Locations where First Nations activities took place (i.e., cultural heritage sites, l andforms or landscapes); and -Intangible cultural heritage values.	The 'First Nations Cultural Heritage' and 'First Nations Cultural Heritage' sections have been updated to address these comments.		The 'First Nations Cultural Heritage' and 'First Nations Cultural Heritage' sections have been updated to address these comments. Intangible cultural heritage values are discussed in Part C. Traditional Use and Knowledge (species specifically identified Aboriginal Groups) is an Indicator for all VCs, as outlined in Table 2 of the dAIR.
FN-LSLIB-45	2015, January		Little Shuswap Lake IB	Rephrasing	Measurable disturbance or loss of archaeological or historical sites/ landforms and landscapes, features, and artifacts	The 'Historical and Archaeological Heritage' section has been updated to address these comments.		The 'Historical and Archaeological Heritage' section has been updated to address these comments. Table 2 and Section 7.2.2 of the dAIR have been modified to reflect these comments.
FN-LSLIB-46	2015, January		Little Shuswap Lake IB	Rephrasing	Changes to the accessibility of archaeological or historical sites/ landforms and landscapes, features, and artifacts	The 'Historical and Archaeological Heritage' section has been updated to address these comments.		The 'Historical and Archaeological Heritage' section has been updated to address these comments. Table 2 and Section 7.2.2 of the dAIR have been modified to reflect these comments.
FN-LSLIB-47	2015, January		Little Shuswap Lake IB	Rephrasing	Measurable disturbance or loss of elements essential to the preservation or character of cultural heritage sites/landforms and landscapes	The 'Historical and Archaeological Heritage' section has been updated to address these comments.		The 'Historical and Archaeological Heritage' section has been updated to address these comments. Table 2 and Section 7.2.2 of the dAIR have been modified to reflect these comments.
FN-LSLIB-48	2015, January		Little Shuswap Lake IB	Rephrasing	• Introduce the assessment for archaeology and historical cultural resources and values;	The Heritage and Archaeology candidate VC has been split into 'First Nations Cultural Heritage' and 'Historical and Archaeological Heritage'. 'First Nations Cultural Heritage' section will be assessed by First Nations in Part C of the Application.		
FN-LSLIB-49	2015, January		Little Shuswap Lake IB	Rephrasing	Identify any potential deficiencies in current available information and outline actions to address these deficiencies	The existing data were reviewed and field studies as well as modelling were initiated to address to data gaps. These studies were discussed with the FN, Core Committee and stakeholders. The existing data has been made available. The language is consistent with the EAO template.		The existing data were reviewed and field studies as well as modelling were initiated to address to data gaps. These studies were discussed with the FN, Core Committee and stakeholders. The existing data has been made available. The language is consistent with the EAO template. Refer to Section 3.3 of the dAIR.
FN-LSLIB-5	2015, January		Little Shuswap Lake IB	Cultural Heritage	8.0 CULTURAL HERITAGE Resources	This has been adressed through the restructuring of archaeology and cultural heritage sections		
FN-LSLIB-50	2015, January		Little Shuswap Lake IB	Rephrasing	Describe interactions between the Project and archaeology and historical cultural resources/values;	The Heritage and Archaeology candidate VC has been split into 'First Nations Cultural Heritage' and 'Historical and Archaeological Heritage'. 'First Nations Cultural Heritage' section will be assessed by First Nations in Part C of the Application.		
FN-LSLIB-51	2015, January		Little Shuswap Lake IB	Rephrasing	• Describe linkages or pathways of effect between archaeology and historical cultural resources/values and other VCs or ICs; and	The Heritage and Archaeology candidate VC has been split into 'First Nations Cultural Heritage' and 'Historical and Archaeological Heritage'. 'First Nations Cultural Heritage' section will be assessed by First Nations in Part C of the Application.		The 'Historical and Archaeological Heritage' section has been updated to address these comments. Table 2 and Section 7.2.2 of the dAIR have been modified to reflect these comments.
FN-LSLIB-52	2015, January		Little Shuswap Lake IB	Rephrasing	• Provide a description and/or associated map(s) of the spatial and temporal boundaries for the assessment of archaeology and historical cultural resources/values, including applicable administrative and jurisdictional boundaries;	First Nations Cultural Heritage will be assessed in Part C of the Application.		Archaeology is outlined in Section 7.2 of the dAIR. First Nations Cultural Heritage will be assessed in Part C of the Application.
FN-LSLIB-53	2015, January		Little Shuswap Lake IB	Rephrasing	• Describe the parameters used in the assessment of archaeology and historical cultural resources/values, and identify any potential deficiencies , if applicable; and	The Heritage and Archaeology candidate VC has been split into 'First Nations Cultural Heritage' and 'Historical and Archaeological Heritage'. 'First Nations Cultural Heritage' section will be assessed by First Nations in Part C of the Application.		Archaeology is outlined in Section 7.2 of the dAIR. The Heritage and Archaeology candidate VC has been split into 'First Nations Cultural Heritage' and 'Historical and Archaeological Heritage'. 'First Nations Cultural Heritage' section will be assessed by First Nations in Part C of the Application.
FN-LSLIB-54	2015, January		Little Shuswap Lake IB	Rephrasing	Describe the technical, regulatory and jurisdictional requirements and considerations affecting the scope of the assessment and whether the sampling methods utilized under the previous archaeological projects were sufficient to provide an accurate representation of potential for impact on cultural heritage sites across the landscape.	The existing data were reviewed and field studies as well as modelling were initiated to address to data gaps. These studies were discussed with the FN, Core Committee and stakeholders. The existing data has been made available. First Nations Cultural Heritage will be assessed in Part C of the Application.		Archaeology is outlined in Section 7.2 of the dAIR. The scope of the assessment is outlined in Section 7.2.3 and 7.2.4 of the dAIR. The existing data were reviewed and field studies as well as modelling were initiated to address to data gaps. These studies were discussed with the FN, Core Committee and stakeholders. The existing data has been made available. First Nations Cultural Heritage will be assessed in Part C of the Application.

REV6 Comments Tracking Table
All dAIR Comments Received Prior to End of August 2016

NO	DATE	COMMENTS ORIGINATED		Topic Subject	Comments	RESPONSE	If unsatisfactory - Comments	Responses
		Name	Affiliation			What		
FN-LSLIB-55	2015, January		Little Shuswap Lake IB	Rephrasing	The existing conditions related to archaeology and historical cultural resources/values; and	The Heritage and Archaeology candidate VC has been split into 'First Nations Cultural Heritage' and 'Historical and Archaeological Heritage'. 'First Nations Cultural Heritage' section will be assessed by First Nations in Part C of the Application.		
FN-LSLIB-56	2015, January		Little Shuswap Lake IB	Rephrasing	Where available traditional or local knowledge related to archaeology and historical cultural resources/values in Part C.	First Nations Cultural Heritage will be assessed in Part C of the Application.		Traditional Use and Knowledge (species specifically identified Aboriginal Groups) is an Indicator for all VCs, as outlined in Table 2 of the dAIR.
FN-LSLIB-57	2015, January		Little Shuswap Lake IB	Rephrasing	Potential effects on traditional use activity sites and features identified as protected cultural heritage resources under the *Heritage Conservation Act* ;	First Nations Cultural Heritage will be assessed in Part C of the Application.		Traditional Use and Knowledge (species specifically identified Aboriginal Groups) is an Indicator for all VCs, as outlined in Table 2 of the dAIR.
FN-LSLIB-58	2015, January		Little Shuswap Lake IB	Rephrasing	The methods used to assess effects of the Project on archaeology and historical cultural resources/values and the level of confidence assigned to these potential affects given the assessment model employed;	The Heritage and Archaeology candidate VC has been split into 'First Nations Cultural Heritage' and 'Historical and Archaeological Heritage'. 'First Nations Cultural Heritage' section will be assessed by First Nations in Part C of the Application. Level of confidence is discussed in Section 3.6. Characterization of Residual Effects of the dAIR, "Articulate the level of confidence associated with the likelihood and significance determination, including a description of any uncertainty associated with the residual effect prediction."		
FN-LSLIB-59	2015, January		Little Shuswap Lake IB	Rephrasing	The Application will identify and characterize potential adverse residual effects taking into account the implementation of proposed mitigation and any identified inadequacy of inventory, sampling frequency and methodology.	This comment references the Transmission Facilities Section (Pg 54, AIR Ref Sec. 6), but no archaeological sampling programs have been designed for this portion of the Project. As an archaeological sampling program has been designed for the Generating Station portion of the Project the 'Historical and Archaeological Heritage' section (Pg 54, AIR Ref Section 2) has been updated to include the following: "The Application will identify and characterize potential adverse residual effects including associated uncertainty in results or limitations of sampling design taking into account the implementation of proposed mitigation."		
FN-LSLIB-6	2015, January		Little Shuswap Lake IB	Cultural Heritage	8.1 Cultural Heritage Background	This has been adressed through the restructuring of archaeology and cultural heritage sections		
FN-LSLIB-60	2015, January		Little Shuswap Lake IB	Rephrasing	The Application will describe any potential cumulative effects that are likely to result from any residual effects of the Project interacting with residual effects of other projects or activities that will or may affect archaeology and historical cultural resources/values. The assessment of cumulative effects will follow the procedures described in Section 4.7.	The Heritage and Archaeology candidate VC has been split into 'First Nations Cultural Heritage' and 'Historical and Archaeological Heritage'. 'First Nations Cultural Heritage' section will be assessed by First Nations in Part C of the Application.		
FN-LSLIB-61	2015, January		Little Shuswap Lake IB	Rephrasing	The Application will describe any potential cumulative effects that are likely to result from any residual effects of the Project interacting with residual effects of other projects or activities that will or may affect archaeology and historical cultural resources/values. The assessment of cumulative effects will follow the procedures described in Section 4.7.	The Heritage and Archaeology candidate VC has been split into 'First Nations Cultural Heritage' and 'Historical and Archaeological Heritage'. 'First Nations Cultural Heritage' section will be assessed by First Nations in Part C of the Application.		
FN-LSLIB-62	2015, January		Little Shuswap Lake IB	Rephrasing	The Application will include Table 8-1 summarizing the assessment of potential effects on archaeology and historical cultural resources/values, proposed key mitigation measures and significance of any adverse residual effects.	The Heritage and Archaeology candidate VC has been split into 'First Nations Cultural Heritage' and 'Historical and Archaeological Heritage'. 'First Nations Cultural Heritage' section will be assessed by First Nations in Part C of the Application.		
FN-LSLIB-63	2015, January		Little Shuswap Lake IB	Rephrasing	To the extent that it is available, Traditional Knowledge (TK), Traditional Land Use (TLU) and current First Nation practices will be incorporated into the assessment of the effects of the Project on the selected VCs (Part B of the Application).	Information provided by First Nations will be included in Part B of the EA. Additionally, Part C will be authored by First Nations, and will include Traditional Knowledge, Traditional Land Use, and current First Nation practices.		Section 3.3 of the dAIR, Existing Conditions, specifies that that Application will include a description of what Traditional Ecological Knowledge (TEK), including Traditional Knowledge (e.g. historical information, oral history and Aboriginal Technical Knowledge) and current Aboriginal practices, was used in the VC assessment for each VC.
FN-LSLIB-64	2015, January		Little Shuswap Lake IB	Rephrasing	• Document BC Hydro's understanding of how the environment is valued by each potentially affected First Nation in relation to their current use or values of lands and resources for traditional purposes, including specific activities conducted in the exercise of asserted or established Aboriginal rights and treaty rights;	First Nations' current use and valuation of lands and resources will be discussed in Part C.		
FN-LSLIB-7	2015, January		Little Shuswap Lake IB	Cultural Heritage	8 1: Summary of Potential Cultural Heritage Effects	This has been adressed through the restructuring of archaeology and cultural heritage sections		
FN-LSLIB-8	2015, January		Little Shuswap Lake IB	Cultural Heritage	8.2 Cultural Heritage and Archaeology	This has been adressed through the restructuring of archaeology and cultural heritage sections		

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FN-LSLIB-9	2015, January		Little Shuswap Lake IB	Cultural Heritage	Summary of Assessment of potential Cultural Heritage Effects	This has been adressed through the restructuring of archaeology and cultural heritage sections		
FN-SIB-1	2015, January		Shuswap IB	Other	"In addition, the development of the dAIR has been informed by the BC Hydro's Core Committee process, which has brought together federal, provincial, and local government agencies, First Nations, and stakeholders to discuss, provide input and make recommendations associated with the Project ". Consultation with Aboriginal Groups occurs through a separate, formal process.	Acknowledged. While the Core Commitee provides a forum for information exchange it does not replace First Nations Consultation.		
FN-SIB-10	2015, January		Shuswap IB	Plants	Information provided by First Nations communities or First Nations coordinators.	Information provided by First Nations was included in the baseline.		Information provided by First Nations was included in the baseline. See Section 4.6 of the dAIR
FN-SIB-11	2015, January		Shuswap IB	Mammals	Ungulates (moose, mule deer) and Caribou. Impacts to Caribou populations in the area, both in short and long term	A discussion of effects of REV6 on Caribou is included in the EA.		A discussion of effects of REV6 on Caribou is included in the EA. See Section 4.9 of the dAIR
FN-SIB-12	2015, January		Shuswap IB	Rephrasing	Consistency with stewardship and Land and Resource Use planning objectives. [add: 'and Land Use']	Land Use is discussed in Section 6.3 of the Application.		Land Use is discussed in Section 6.3 of the Application.See Section 6.3 of the dAIR
FN-SIB-13	2015, January		Shuswap IB	Land and Resource Use	Levels of harvest and users. [see also Cultural Heritage VC and associated sub-components]	Part C of the Application will include First Nations Cultural Heritage.		
FN-SIB-14	2015, January		Shuswap IB	Cultural Heritage	Locations with protected archaeological or historical sites, features and artifacts [this sub-component should clarify that 'Archaeology' includes landforms and landscapes, not just sites as defined under the Heritage Conservation Act]	The 'Historical and Archaeological Heritage' VC subcomponent has been updated to include landscapes and landforms. Part C of the Application will include First Nations Cultural Heritage.		
FN-SIB-15	2015, January		Shuswap IB	Cultural Heritage	Locations where First Nations activities took place (i.e., cultural heritage sites) [this sub-component should clarify that Cultural Heritage as for Archaeology includes sites, landforms and landscapes not covered under the BCHCA	Part C of the Application will include First Nations Cultural Heritage.		
FN-SIB-16	2015, January		Shuswap IB	Cultural Heritage	Measurable disturbance or loss of elements essential to the preservation or character of cultural heritage sites, landforms or landscapes.	The 'Historical and Archaeological Heritage' VC subcomponent has been updated to include landscapes and landforms. Part C of the Application will include First Nations Cultural Heritage.		
FN-SIB-17	2015, January		Shuswap IB	Rephrasing	3. Hugh Keenleyside Dam and its effect on Arrow Reservoir [This needs to include all associated access roads, transmission lines, capacitor stations and other associated infrastructure}	The Rev 6 environmental assessment process will take into consideration the hydrological effects of Hugh Keenleyside Dam and the operation of Arrow Reservoir. Hugh Keenleyside infrastructure effects won't be included unless there is an interaction with the Project effects.		The Rev 6 environmental assessment process will take into consideration the hydrological effects of Hugh Keenleyside Dam and the operation of Arrow Reservoir. Hugh Keenleyside infrastructure effects will be included if there is an interaction with the Project effects.See Section 3.10 of the dAIR. Hugh Keenleyside dam impounds Arrow Reservoir. Arrow Reservoir backfloods to Revelstoke at full pool (summer). Therefore, Hugh Keenleyside operations affect all VCs in the MCR. (many or most of them)
FN-SIB-18	2015, January		Shuswap IB	Climate Change	Impact of climate change using various models	Climate change is discussed in Section 10 of the EA		Climate change is discussed in Section 10 and 4.1.1 of the EA. See Section 4.1 of the dAIR
FN-SIB-19	2015, January		Shuswap IB	Fish	Commercial, Recreational and Aboriginal fisheries (CRA), as defined in the *Fisheries Act* . Does not include federal/provincial listed species above (e.g., mountain whitefish, rainbow trout, burbot, kokanee); and [why are Aboriginal fisheries lumped in here? These include all fish species list under both bullets and others not listed	CRA is a definition in the *Fisheries Act* which is a regulatory requirement. This bullet is meant to include all those species that are not listed as species at risk (i.e., species other than sturgeon and bull trout). The three categories taken together should encompass the existing fish community.		CRA is a definition in the Fisheries Act which is a regulatory requirement. This bullet is meant to include all those species that are not listed as species at risk (i.e., species other than sturgeon and bull trout). The three categories taken together should encompass the existing fish community. See Section 4.4 of the dAIR.
FN-SIB-2	2015, January		Shuswap IB	Other	Agencies, First Nations, and stakeholders involved in the development of the dAIR include: Shuswap Nation Tribal Council (SNTC): Adams Lake, Bonaparte, Kamloops, Little Shuswap, Neskonlith, Shuswap, Simpcw, Skeetchestn, Splatsin, Whispering Pines; [Shouldn't only the Bands who are actively participating in the review be listed? The current list is misleading as it shows all Bands who are currently members of the SNTC - Little Shuswap is NOT currently an SNTC member]	BC Hydro will be guided by the Section 11 Order in determining the inclusion of specific First Nations in the Enviromental Assessment and is reflected in the Aboriginal Consultation Plan.		BC Hydro will be guided by the Section 11 Order in determining the inclusion of specific First Nations in the Enviromental Assessment and is reflected in the Aboriginal Consultation Plan. These are listed in the Preface of the dAIR and the requirements for consultation is outlined in Section 2, 11 and 12 of the dAIR.
FN-SIB-20	2015, January		Shuswap IB	Fish	Traditional Use and Knowledge [including but not limited to: anadromous fish species (future re-introduction) including sockeye salmon, chinook salmon, coho salmon, steelhead trout}	Fish resources, including salmon, are discussed in Section 4.2.2.2.3 of the EA. Further information on Traditional Use and Knowledge will be included in Part C.		Fish resources, including salmon, are discussed in Section 4.6.2.2.3 of the EA and see Section 4.6 of the dAIR. Further information on Traditional Use and Knowledge will be included in Part C.
FN-SIB-21	2015, January		Shuswap IB	Rephrasing	Knowledge provided by First Nations, including historical information, oral history and Aboriginal Technical Knowledge.	Accepted. Will be updated in the AIR.		Accepted. Will be updated in the AIR. Defined in Section 3.3 of the dAIR
FN-SIB-22	2015, January		Shuswap IB	Rephrasing	Information provided by First Nations communities or First Nations coordinators, including historic information on changes in plant distribution over time due to climate change.	Climate change is discussed in Section 4.1.1 of the EA		Climate change is discussed in Section 4.1.1 of the EA. See Section 4.1 and Section 10 of the dAIR
FN-SIB-23	2015, January		Shuswap IB	Climate Change	Add: • Impacts of climate change on habitat distribution for culturally important species.	Climate change is discussed in Section 4.1.1 of the EA		Climate change is discussed in Section 4.1.1 of the EA. See Section 4.1 and Section 10 of the dAIR

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FN-SIB-24	2015, January		Shuswap IB	Rephrasing	◆ Traditional knowledge and current First Nation practices.	Accepted. Changed to Traditional knowledge and current Aboriginal practices		
FN-SIB-25	2015, January		Shuswap IB	Rephrasing	◆ Traditional knowledge and current First Nation practices.	Accepted. Changed to Traditional knowledge and current Aboriginal practices		
FN-SIB-26	2015, January		Shuswap IB	Rephrasing	◆ Traditional knowledge and current First Nation practices.	Accepted. Changed to Traditional knowledge and current Aboriginal practices		
FN-SIB-27	2015, January		Shuswap IB	Rephrasing	◆ Traditional knowledge and current First Nation practices.	Accepted. Changed to Traditional knowledge and current Aboriginal practices		
FN-SIB-28	2015, January		Shuswap IB	Climate change	Add: ◆ Impacts of climate change on habitat distribution for culturally important species.	Climate change is discussed in Section 4.1.1 of the EA		Climate change is discussed in Section 4.1.1 of the EA. See Section 4.1 and Section 10 of the dAIR
FN-SIB-29	2015, January		Shuswap IB	Rephrasing	◆ Local Government and First Nation Finances; and	First Nations finances will be included where provided by First Nations.		
FN-SIB-3	2015, January		Shuswap IB	Other	Nicola Tribal Association (NTA): Nooaitch Indian Band, Nicomen Indian Band, Shackan Indian Band, Siska Indian Band, Coldwater Indian Band, Cook's Ferry Indian Band; [are these Bands actually involved or should they be listed as 'notification only'?]	BC Hydro will be guided by the Section 11 Order in determining the inclusion of specific First Nations in the Enviromental Assessment and is reflected in the Aboriginal Consultation Plan.		
FN-SIB-30	2015, January		Shuswap IB	Rephrasing	Local government and First Nation expenditures and revenues	First Nations expenditures and revenues will be included where provided by First Nations.		
FN-SIB-31	2015, January		Shuswap IB	Rephrasing	Provide a description and associated map(s) of the spatial and temporal boundaries for the assessment of economic effects, including applicable administrative and jurisdictional (including First Nation Territorial) boundaries	Maps of FN Territorial boundaries are included in Part A.		Maps of FN Territorial boundaries are included in Part A. See Section 1.1 of the dAIR
FN-SIB-32	2015, January		Shuswap IB	Rephrasing	◆ Traditional knowledge and current First Nation practices.	Accepted. Changed to Traditional knowledge and currentAboriginal practices		
FN-SIB-33	2015, January		Shuswap IB	Rephrasing	The sources of information will include, but are not limited to, local and regional employment agencies, business associations, Regional First Nation Corporate entities, hotels and motel, alternative accomm	Agreed		Agreed. See Section 5 of the dAIR
FN-SIB-34	2015, January		Shuswap IB	Rephrasing	◆ Traditional knowledge and current First Nation practices.	Accepted. Changed to Traditional knowledge and current Aboriginal practices		
FN-SIB-35	2015, January		Shuswap IB	Rephrasing	◆ Traditional knowledge and current First Nation practices.	Accepted. Changed to Traditional knowledge and current Aboriginal practices		
FN-SIB-36	2015, January		Shuswap IB	Rephrasing	… Revelstoke municipal land use plans, lands of interest to First Nations and First Nation Land Use Plans, and lands for traditional uses	Accepted. Changed to Traditional knowledge and current Aboriginal practices		
FN-SIB-37	2015, January		Shuswap IB	Rephrasing	◆ Introduce the assessment for land and resource use, including recreation, viewscapes, cultural landscapes, agriculture, parks and conservation areas, and land tenure;	Information pertaining to Cultural Landscape will be provided in Part C.		See Section 6.3 of the dAIR. Additional information pertaining to Cultural Landscape will be provided in Part C.
FN-SIB-38	2015, January		Shuswap IB	Rephrasing	8.0 CULTURAL HERITAGE Resources	The Heritage and Archaeology candidate VC has been split into 'First Nations Cultural Heritage' and 'Historical and Archaeological Heritage'. 'First Nations Cultural Heritage' section will be assessed by First Nations in Part C of the Application. Subcomponents for the 'First Nations Cultural Heritage' could include the following: landforms; intangible heritage sites; traditional use & knowledge. Socio-community and socio-economic effects assessment may be included in Part C of the Application.		The Heritage and Archaeology candidate VC has been split into 'First Nations Cultural Heritage' and 'Historical and Archaeological Heritage'. See Section 7.2 of the dAIR. 'First Nations Cultural Heritage' section will be assessed by First Nations in Part C of the Application. Subcomponents for the 'First Nations Cultural Heritage' could include the following: landforms; intangible heritage sites; traditional use & knowledge. Socio-community and socio-economic effects assessment may be included in Part C of the Application.
FN-SIB-39	2015, January		Shuswap IB	Rephrasing	The Application will provide a general description of the existing cultural context and resources in the areas surrounding the Project. The VCs, sub components and indicators associated with the cultural heritage effects will be described in the subsequent sections.	This has been addressed through the restructuring of archaeology and cultural heritage sections		This has been addressed through the restructuring of archaeology and cultural heritage sections. See Section 7.2 of the dAIR.
FN-SIB-4	2015, January		Shuswap IB		Nlakapamux Nation Tribal Council (NNTC): Lytton First Nation, Oregon Jack Creek Band, Ashcroft Indian Band, Boothroyd Indian Band, Boston Bar First Nation, Skuppah Indian Band, Spuzzum First Nation; [as above]	BC Hydro will be guided by the Section 11 Order in determining the inclusion of specific First Nations in the Enviromental Assessment. This is reflected in the Aboriginal Consultation Plan.		
FN-SIB-40	2015, January		Shuswap IB	Rephrasing	The assessment of archaeology and cultural resources protected under the *Heritage Conservation Act* (HCA) as well as other cultural resources and values not recognized under the HCA will be based on existing and available information, including studies carried out for the assessment of the Revelstoke Unit 5 Project and associated post construction monitoring studies, and studies carried out in relation to the Columbia River Project Water Use Plan, and studies carried out under BC Hydro's Reservoir Archaeology Program (RAP).	These comments will be addressed in the 'First Nations Cultural Heritage' section.		These comments will be addressed in the Historical and Archaeological Heritage section of the EA. See Section 7.2 of the dAIR.
FN-SIB-41	2015, January		Shuswap IB	Rephrasing	Sub-components of the Cultural Heritage VC for all project areas include: □ Locations where First Nations activities took place (i.e., cultural heritage sites, landforms or landscapes);	The 'Historical and Archaeological Heritage' VC subcomponent has been updated to include landscapes and landforms. Part C of the Application will include First Nations Cultural Heritage.		

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FN-SIB-42	2015, January		Shuswap IB	Rephrasing	Measurable disturbance or loss of archaeological or historical sites/landforms and landscapes, features, and artifacts	The 'Historical and Archaeological Heritage' VC subcomponent has been updated to include landscapes and landforms.		
FN-SIB-43	2015, January		Shuswap IB	Rephrasing	Changes to the accessibility of archaeological or historical sites/landforms and landscapes, features, and artifacts	The 'Historical and Archaeological Heritage' VC subcomponent has been updated to include landscapes and landforms.		
FN-SIB-44	2015, January		Shuswap IB	Rephrasing	Measurable disturbance or loss of elements essential to the preservation or character of cultural heritage sites/landforms and landscapes	The 'Historical and Archaeological Heritage' VC subcomponent has been updated to include landscapes and landforms. Part C of the Application will include First Nations Cultural Heritage.		
FN-SIB-45	2015, January		Shuswap IB	Rephrasing	• Introduce the assessment for cultural heritage resources and values;	This has been addressed through the restructuring of archaeology and cultural heritage sections		This has been addressed through the restructuring of archaeology and cultural heritage sections. See Section 7.2 of the dAIR.
FN-SIB-46	2015, January		Shuswap IB	Rephrasing	Identify any potential deficiencies in current available information and outline actions to address these deficiencies	The existing data were reviewed and field studies as well as modelling were initiated to address to data gaps. These studies were discussed with the FN, Core Committee and stakeholders. The existing data has been made available. The language is consistent with the EAO template.		The existing data were reviewed and field studies as well as modelling were initiated to address data gaps. These studies were discussed with the FN, Core Committee and stakeholders. The existing data has been made available. The language is consistent with the EAO template. See Section 7.2 of the dAIR.
FN-SIB-47	2015, January		Shuswap IB	Rephrasing	Describe interactions between the Project and cultural heritage resources	This has been addressed through the restructuring of archaeology and cultural heritage sections		
FN-SIB-48	2015, January		Shuswap IB	Rephrasing	• Describe linkages or pathways of effect between cultural heritage resources /values and other VCs or ICs; and	This has been addressed through the restructuring of archaeology and cultural heritage sections		
FN-SIB-49	2015, January		Shuswap IB	Rephrasing	• Provide a description and/or associated map(s) of the spatial and temporal boundaries for the assessment of cultural heritage resources/values, including applicable administrative and jurisdictional boundaries;	This has been addressed through the restructuring of archaeology and cultural heritage sections		
FN-SIB-5	2015, January		Shuswap IB	Cultural Heritage	8.0 CULTURAL HERITAGE Resources	The Heritage and Archaeology candidate VC has been split into 'First Nations Cultural Heritage' and 'Historical and Archaeological Heritage'. 'First Nations Cultural Heritage' section will be assessed by First Nations in Part C of the Application. Subcomponents for the 'First Nations Cultural Heritage' could include the following: landforms; intangible heritage sites; traditional use & knowledge. Socio-community and socio-economic effects assessment may be included in Part C of the Application.		The Heritage and Archaeology candidate VC has been split into 'First Nations Cultural Heritage' and 'Historical and Archaeological Heritage'. 'First Nations Cultural Heritage' section will be assessed by First Nations in Part C of the Application. See Section 7.2 of the dAIR Subcomponents for the 'First Nations Cultural Heritage' could include the following: landforms; intangible heritage sites; traditional use & knowledge. Socio-community and socio-economic effects assessment may be included in Part C of the Application.
FN-SIB-50	2015, January		Shuswap IB	Rephrasing	• Describe the parameters used in the assessment of cultural heritage resources/values, and identify any potential deficiencies, if applicable; and	Part C of the Application will include First Nations Cultural Heritage.		
FN-SIB-51	2015, January		Shuswap IB		• Describe the technical, regulatory and jurisdictional requirements and considerations affecting the scope of the assessment and whether the sampling methods utilized under the previous archaeological projects were sufficient to provide an accurate representation of potential for impact on cultural heritage sites across the landscape.	The existing data were reviewed and field studies as well as modelling were initiated to address to data gaps. These studies were discussed with First Nations, the Core Committee, and stakeholders. The existing data has been made available to First Nations to assess the potential effects on cultural heritage.		The existing data were reviewed and field studies as well as modelling were initiated to address to data gaps. These studies were discussed with First Nations, the Core Committee, and stakeholders. The existing data has been made available to First Nations to assess the potential effects on cultural heritage.See Section 7.2 of the dAIR.
FN-SIB-52	2015, January		Shuswap IB	Rephrasing	The existing conditions related to cultural heritage resources/values;	This has been addressed through the restructuring of archaeology and cultural heritage sections		
FN-SIB-53	2015, January		Shuswap IB	Rephrasing	Where available traditional or local knowledge related to cultural heritage resources/values in part c	Agreed. Working with FN to determine contents of Sec C within EO guidelines		Agreed. Working with FN to determine contents of Sec C within EAO guidelines. See Section 11 of the dAIR.
FN-SIB-56	2015, January		Shuswap IB	Rephrasing	• Potential effects on traditional use activity sites and features identified as protected cultural heritage resources under the *Heritage Conservation Act* ;	The 'First Nations Cultural Heritage' section has been updated.		
FN-SIB-57	2015, January		Shuswap IB	Rephrasing	The methods used to assess effects of the Project on cultural heritage resources/values and the level of confidence assigned to these potential affects given the assessment model employed	This has been addressed through the restructuring of archaeology and cultural heritage sections		
FN-SIB-58	2015, January		Shuswap IB	Rephrasing	The Application will identify and characterize potential adverse residual effects taking into account the implementation of proposed mitigation and any identified inadequacy of inventory, sampling frequency and methodology.	The dAIR has been updated consistent with the updated template provided by the EAO.		Characterization of residual effects is outlined in Section 3.6 of the dAIR, which specifies the Application will articulate the level of confidence associated with the likelihood and significance determination, including a description of any uncertainty associated with the residual effect prediction.

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FN-SIB-59	2015, January		Shuswap IB	Rephrasing	The Application will describe any potential cumulative effects that are likely to result from any residual effects of the Project interacting with residual effects of other projects or activities that will or may affect cultural heritage resources/values.	The dAIR has been updated to be consistent with the updated template provided by the EAO. The dAIR now includes effects on cultural heritage resources and values.		Sections 7.2.7 and 7.2.8 of the dAIR reference assessment of residual effects and cumulative effects for heritage resources. Potential impacts to cultural heritage will be considered in Part C of the Application, as noted in Table 1 of the dAIR.
FN-SIB-6	2015, January		Shuswap IB	Cultural Heritage	8.2 Cultural Heritage and Archaeology	The Heritage and Archaeology candidate VC has been split into 'First Nations Cultural Heritage' and 'Historical and Archaeological Heritage'. 'First Nations Cultural Heritage' section will be assessed by First Nations in Part C of the Application. Subcomponents for the 'First Nations Cultural Heritage' could include the following: landforms; intangible heritage sites; traditional use & knowledge. Socio-community and socio-economic effects assessment may be included in Part C of the Application.		The Heritage and Archaeology candidate VC has been split into 'First Nations Cultural Heritage' and 'Historical and Archaeological Heritage'. 'First Nations Cultural Heritage' section will be assessed by First Nations in Part C of the Application. See Section 7.2 of the dAIR Subcomponents for the 'First Nations Cultural Heritage' could include the following: landforms; intangible heritage sites; traditional use & knowledge. Socio-community and socio-economic effects assessment may be included in Part C of the Application.
FN-SIB-60	2015, January		Shuswap IB	Rephrasing	The Application will describe potential any cumulative effects that are likely to result from any residual effects of the Project interacting with residual effects of other projects or activities that will or may affect cultural heritage resources/values. The assessment of cumulative effects will follow the procedures described in Section 4.7.	The Heritage and Archaeology candidate VC has been split into 'First Nations Cultural Heritage' and 'Historical and Archaeological Heritage'. 'First Nations Cultural Heritage' section will be assessed by First Nations in Part C of the Application.		
FN-SIB-61	2015, January		Shuswap IB	Rephrasing	The Application will include Table 8-1 summarizing the assessment of potential effects on cultural heritage resources/values, proposed key mitigation measures and significance of any adverse residual effects.	The Heritage and Archaeology candidate VC has been split into 'First Nations Cultural Heritage' and 'Historical and Archaeological Heritage'. 'First Nations Cultural Heritage' section will be assessed by First Nations in Part C of the Application.		
FN-SIB-62	2015, January		Shuswap IB	Rephrasing	To the extent that it is available, Traditional Knowledge (TK), Traditional Land Use (TLU) and current First Nation practices will be incorporated into the assessment of the effects of the Project on the selected VCs (Part B and C of the Application).	Accepted. Changed to Traditional knowledge and current Aboriginal practices		
FN-SIB-63	2015, January		Shuswap IB	Rephrasing	• Document BC Hydro's understanding of how the environment is valued by each potentially affected First Nation in relation to their current use or values of lands and resources for traditional purposes, including specific activities conducted in the exercise of asserted or established Aboriginal rights and treaty rights;	To be incorporated in Part C.		
FN-SIB-7	2015, January		Shuswap IB	Cultural Heritage	Summary of Assessment of potential Cultural Heritage Effects	The Heritage and Archaeology candidate VC has been split into 'First Nations Cultural Heritage' and 'Historical and Archaeological Heritage'. 'First Nations Cultural Heritage' section will be assessed by First Nations in Part C of the Application. Subcomponents for the 'First Nations Cultural Heritage' could include the following: landforms; intangible heritage sites; traditional use & knowledge. Socio-community and socio-economic effects assessment may be included in Part C of the Application.		The Heritage and Archaeology candidate VC has been split into 'First Nations Cultural Heritage' and 'Historical and Archaeological Heritage'. 'First Nations Cultural Heritage' section will be assessed by First Nations in Part C of the Application. See Section 7.2 of the dAIR Subcomponents for the 'First Nations Cultural Heritage' could include the following: landforms; intangible heritage sites; traditional use & knowledge. Socio-community and socio-economic effects assessment may be included in Part C of the Application.
FN-SIB-8	2015, January		Shuswap IB	Other	The Application will include a summary of the consultation activities undertaken with the identified First Nations potentially affected by the proposed project (as identified in the Section 11 Order) including the information listed at parts 3.2.1 and 3.2.2 below. The notification and consultation activities will comply with the Public Consultation Policy Regulation (B.C. Reg. 373/2002) under BCEAA and will be undertaken in accordance with the consultation provisions of the Section 11 Order.[Statement needed that clarifies that the intent of participation by First Nations in the Core Committee and related sub-committees does not replace the requirement for a distinct and separate consultation process]	Acknowledged. While the Core Commitee provides a forum for information exchange it does not replace First Nations Consultation. BC Hydro will be guided by the Section 11 Order in determining the inclusion of specific First Nations in the Enviromental Assessment, and this is reflected in the Aboriginal Consultation Plan.		Acknowledged. While the Core Commitee provides a forum for information exchange it does not replace First Nations Consultation. BC Hydro will be guided by the Section 11 Order in determining the inclusion of specific First Nations in the Enviromental Assessment, and this is reflected in the Aboriginal Consultation Plan. See Section 2, 11 and 12 of the dAIR.
FN-SIB-9	2015, January		Shuswap IB	First Nation Consultation	To-date, the Core Committee has been an important mechanism for consultation related to the Project. [specify 'non-First Nations' consultation]	The Core Commitee is a forum for information exchange and advice. First Nations are welcome to attend but the Core Committee does not replace First Nation Consultation.		The Core Commitee is a forum for information exchange and advice. First Nations are welcome to attend but the Core Committee does not replace First Nation Consultation. See Section 11 of the dAIR

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FN-STS-1	2015, January		Sexqéltkemc te Secwepemc	Assessment Methodology	Consider the potential effect of changes in water level on spawning access for BT and KO in tributaries to the Revelstoke Reservoir, including the magnitude, duration, and frequency of drawdown during migration/spawning periods. Rational: BC Hydro's assessment of changes in water levels focuses on the Revelstoke Dam Forebay. These results do not reflect site specific conditions experienced in (near) spawning tributaries. Further water level changes could have significant effects on fish if tributary access is already impeded. Only 7 of 30 tagged fish were observed in spawning tributaries in a previous study (i.e. 2003; pre-Rev 5). *(Baseline Table, PA-RR, Sub component-Kokanee, Bull Trout)*	The assessment will include an evaluation of REV6 effects on water level fluctuations on Revelstoke Reservoir, including magnitude, duration, and frequency across seasons. BC Hydro's assesment has included Revelstoke Reservoir as a whole, not just the forebay. Previous telemetry work on bull trout in Revelstoke Reservoir showed no tributary access issues; numbers of fish tracked into tributaries were not related to access. Additionally, kokanee escapement surveys conducted under CLBMON-2 and BC Hydro assessments of the reservoir at lower than normal water levels have not identified any access issues related to reservoir water levels.		The assessment will include an evaluation of REV6 effects on water level fluctuations on Revelstoke Reservoir, including magnitude, duration, and frequency across seasons (Section 4.1.2 Hydrology and 4.1.3 Fluvial Geomorphology of the dAIR). BC Hydro's assessment has included Revelstoke Reservoir as a whole, not just the forebay. See Section 4.1 of the dAIR. Previous telemetry work on bull trout in Revelstoke Reservoir showed no tributary access issues; numbers of fish tracked into tributaries were not related to access. Additionally, kokanee escapement surveys conducted under CLBMON-2 and BC Hydro assessments of the reservoir at lower than normal water levels have not identified any access issues related to reservoir water levels. See Section 4.1 and 4.4 of the dAIR.
FN-STS-10	2015, January		Sexqéltkemc te Secwepemc	First Nations Governance	Engage First Nations in a meaningful discussion on co-management of cultural and natural resources in the Upper Columbia River. Development of relationships and trust between BC Hydro and First Nations can only be achieved through meaningful consideration and incorporation of our values and goals with respect to cultural and natural resource management.	The Section 11 Order of the BCEAA process identifies the scope of the Environmental Assessment, which in the case of Revelstoke Unit 6 Project, is on the incremental effects of construction and operation of the sixth unit. BC Hydro acknowledges the Sexqeltkemc te Secwepemc comment that this scope does not include impacts resulting from all BC Hydro infrastructure and operations in the Upper Columbia River. BC Hydro is committed to engaging First Nations in meaningful discussions at the Nation level, outside of the Project, on how we might to better incorporate FN values and goals into BC Hydro's cultural and natural resource management activities in the Upper Columbia River.		
FN-STS-11	2015, January		Sexqéltkemc te Secwepemc	Assessment Methodology	The current process for selecting VCs and assesing cultural and environmental impacts is limiting and somewhat narrow in scope given the extent of exisiting impacts resulting from the BC Hydro infrastructure and operations in the Upper Columbia River	The Section 11 Order of the BCEAA process identifies the scope of the Environmental Assessment, which in the case of Revelstoke Unit 6 Project, is on the incremental effects of construction and operation of the sixth unit. BC Hydro acknowledges the Sexqeltkemc te Secwepemc comment that this scope does not include impacts resulting from all BC Hydro infrastructure and operations in the Upper Columbia River. BC Hydro is committed to engaging First Nations in meaningful discussions at the Nation level, outside of the Project, on how we might to better incorporate FN values and goals into BC Hydro's cultural and natural resource management activities in the Upper Columbia River.		
FN-STS-12	2015, January		Sexqéltkemc te Secwepemc	Assessment Methodology	A comprehensive cumulative effects assessment, including past , present and (reasonably foreseeable) future development and impacts within a scientifically justifiable temporal and spatial scope, should be completed. This assessment should include both cultural and environmental impacts and should include all BC Hydro infrastructure and operations associated with Mica, Revelstoke and Keenleyside Dams (i.e. access roads, transmission lines, capacitor stations and other associated infrastructure)	BC Hydro will be completing a comprehensive cumulative effects assessment of those VC with residual effects. The process for scoping the assessment is described further in the EAO's guideline for the selection of valued components and assessment of potential effects, Section 3.5.5 : http://www.eao.gov.bc.ca/pdf/U224EAO_Valued_Components_Guideline_2013_09_09.pdf; Where relevant, BC Hydro will explain if and how other past and present projects and activities have affected, or are affecting, each VC. Past and present projects will include, where applicable, Mica, Revelstoke, and Keenleyside Dams. Reasonably foreseeable future developments and impacts within a scientifically justifiable temporal and spatial scope will be included. Where applicable, both cultural and environmental impacts will be considered.		BC Hydro will be completing a comprehensive cumulative effects assessment of those VC with residual effects. The process for scoping the assessment is described further in the EAO's guideline for the selection of valued components and assessment of potential effects, Section 3.5.5 : http://www.eao.gov.bc.ca/pdf/U224EAO_Valued_Components_Guideline_2013_09_09.pdf; and outlined in 3.10 of the dAIR. Where relevant, BC Hydro will explain if and how other past and present projects and activities have affected, or are affecting, each VC. Past and present projects will include, where applicable, Mica, Revelstoke, and Keenleyside Dams. Reasonably foreseeable future developments and impacts within a scientifically justifiable temporal and spatial scope will be included. Where applicable, both cultural and
FN-STS-13	2015, January		Sexqéltkemc te Secwepemc	Assessment Methodology	Identification of baseline conditions should include characterization of conditions of (at least) 3 points in time, including pre-dam, pre-Rev 5 and pre-Rev 6. Temporal trends should be developed (estimated) for each VC to better understand the extent of past change and context of Rev 6 impacts. This analysis is necessary to adequately determine the significance and risk of further impacts.	Pre and post dam conditions are included in the baseline as they contribute to the overall understanding of the VCs.		Pre and post dam conditions are included in the assessment as they contribute to the overall understanding of the VCs. The methodology for existing conditions is outlined in 3.3.

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FN-STS-14	2015, January		Sexqéltkemc te Secwepemc	Assessment Methodology	Robust metrics need to be used, and in some cases developed, for each of the VCs in order to understand the extent of change and potential impacts. This should be based on scientific literature and will ensure transparency and unbiased determinations. Much emphasis is currently placed on professional judgement which, which in our opinion, does not constitute scientific evidence of a significance impact or lack thereof.	The evaluation of the VC, indicators, and methods for review are based scientific literature and the findings of previous studies and monitoring programs, as well as the experience and expertise of qualified professionals.		The evaluation of the VC, indicators, and methods for review are based scientific literature and the findings of previous studies and monitoring programs, as well as the experience and expertise of qualified professionals. See Section 16 in the dAIR.
FN-STS-15	2015, January		Sexqéltkemc te Secwepemc	Assessment Methodology	Significance thresholds should be developed for each VC, with consideration of past changes, current conditions, and the risk of further change. Risk assessents will be an important prerequisite for the determination of significance thresholds. Aboriginal perspectives and current on significance thresholds and acceptable risks need to be considered and incorporated.	Significance criteria have been presented in the AIR and described in greater detail in the draft Application. Inputs related to significance criteria from First Nations and regulators will be considered and made public as part of the EA process.		
FN-STS-16	2015, January		Sexqéltkemc te Secwepemc	reliability of informattion	Determination of the reliability of informattion used in these assessments is paramount. We have repeatedley requested a comprehensive gap analysis of the information used in these assessments and determinations. Recognizing that BC Hydro has recently provided a comprehensive list of information and study results, there has not yet been any determination of the reliability of this information and/or critical gaps in this information.	A comprehensive review of existing data was conducted and field studies as well as modelling were initiated to address to data gaps. New work included 3 field studies at the capacitor station site, the installation of water level loggers at selected sites in the MCR and the development of a new hydrological model. These studies were discussed with the FN , Core Committee and stakeholders. All existing data were made available.		A comprehensive review of existing data was conducted and field studies as well as modelling were initiated to address to data gaps. New work included 3 field studies at the capacitor station site, the installation of water level loggers at selected sites in the MCR and the development of a new hydrological model. These studies were discussed with the FN , Core Committee and stakeholders. All existing data were made available. The method for gathering existing data is outlined in Section 3.3.
FN-STS-17	2015, January		Sexqéltkemc te Secwepemc	Ecosystem Health and Function	Ecosystem Health and Function should be a VC, rather than just a sub-component of aquatic and terrestrial VCs. It is important to consider both top-down and bottom-up pathways for example: 1) Ecosystem Health and Function as a VC considers all aquatic and terrestrial impacts on the ecosystem as a whole; and 2) Ecosystem Health and Function as a sub-component considers ecosystem impacts on aquatic and terrestrial resources.	An ecosystem is defined as a biological community of interacting organisms within the environment. Ecosystem function is the biological, geochemical and other processes that occur within the ecosystem. Biodiversity is defined as the variety of organisms found within the ecosystem. These are all fairly broad terms, and rather than discussing ecosystem health and function as a whole, the EA discusses potential impacts in more manageable topics that separate aquatic from terrestrial, and terrestrial into further groups that discuss plants from animals. Recognizing that plant and animal occurrence are linked to the ecological communities present within the study area, the EA discusses the ecosystems present, how they have been formed, and what species generally use them – all within the discussion Ecological Communities. As a result, the current structure of the EA discusses what the various ecological communities are and what past and current activities have had on shaping those that are present (Section		An ecosystem is defined as a biological community of interacting organisms within the environment. Ecosystem function is the biological, geochemical and other processes that occur within the ecosystem. Biodiversity is defined as the variety of organisms found within the ecosystem. These are all fairly broad terms, and rather than discussing ecosystem health and function as a whole, the EA discusses potential impacts in more manageable topics that separate aquatic from terrestrial, and terrestrial into further groups that discuss plants from animals. Recognizing that plant and animal occurrence are linked to the ecological communities present within the study area, the EA discusses the ecosystems present, how they have been formed, and what species generally use them – all within the discussion Ecological Communities. As a result, the current structure of the EA discusses
FN-STS-18	2015, January		Sexqéltkemc te Secwepemc	Biodiversity	Biodiversity should also be a VC based on the same rational provided above.	Ecosystem Health and Function for Biodiversity has been included as a sub-component for the Ecological Communities VC.		Ecosystem Health and Function for Biodiversity has been included as a sub-component for the Ecological Communities VC. See Table 2 of Section 3.1 of the dAIR.
FN-STS-19	2015, January		Sexqéltkemc te Secwepemc	Cultural Heritage	Cultural Heritage Resource should be a stand-alone VC. Sub components to this VC would include culturally important resources (e.g. water, fish, wildlife, plants…etc.), land use (e.g. hunting, fishing, gathering, transportation,recreation, cultural sites, villages sites…etc.), and archeology. Archeology should provide landforms and landscapes covered and not covered under the BC Heritage Act Conservation Act. Intangible cultural heritage values should also be included, such as place names and transmission of knowledge. Past, present and future cultural heritage impacts should be assessed. Socio-community and socio-economic should also be a key focus and sub-component of this assessment. This assessment should also include compilation of indigenous knowledge related to land and resources uses and be solely based on aboriginal perspectives of the effects of BC Hydro infrastructure and operations. The use of information from previous studies as a baseline reference is not supported. We will provide a cultural heritage assessment for the Rev 6 project. Further discussions with BC Hydro will be required to address this issue.	The Heritage and Archaeology candidate VC has been split into 'First Nations Cultural Heritage' and 'Historical and Archaeological Heritage'. 'First Nations Cultural Heritage' including intangible cultural heritage values will be assessed by First Nations in Part C of the Application.		Cultural heritage resources, intangible cultural heritage values, potential cultural heritage impacts, and potential socio-community and socio-economic effects will be considered in Part C of the Application, as noted in Table 1 of the dAIR. Traditional Use and Knowledge (species specifically identified Aboriginal Groups) is an Indicator for all VCs, as outlined in Table 2 of the dAIR. In addition to authoring Part C, First Nations were invited to provide cultural perspectives to be included at the top of each section of Part B of the Application, and where are provided, they will be included in the Application. Aboriginal perspectives of the effects of BC Hydro infrastructure and operations may be included in Part C of the Application if desired. Part B assessment of archaeology
FN-STS-2	2015, January		Sexqéltkemc te Secwepemc	Assessment Methodology	Include the results of the KO entrainment studies as part of this assessment, including the effects of reduced food sources for BT (i.e. juvenile KO). <u>Rational:</u> Entrainment of KO is directly relevant to the assessment of impacts on KO and BT populations. *(Baseline Table, PA-RR, Sub component-Kokanee, Bull Trout)*	Results from the Entrainment Strategy will be included in the REV6 assessment, specifically related to kokanee at Revelstoke Generating Station. Entrainment (specifically kokanee) is included as an indicator in Table 4-1. Additional data from CLBMON-2 on kokanee population assessments in Revelstoke Reservoir have been reviewed and included.		Results from the Entrainment Strategy will be included in the REV6 assessment, specifically related to kokanee at Revelstoke Generating Station. Entrainment (specifically kokanee) is included as an indicator in Table 4-1. Additional data from CLBMON-2 on kokanee population assessments in Revelstoke Reservoir have been reviewed and included. See Section 3 and 4.4 of the dAIR

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FN-STS-20	2015, January		Sexqéltkemc te Secwepemc	Restoration of Salmon	Restoration of Salmon to the headwaters of the Columbia River system should be included in the fisheries components of the VC and EIA documents, including an assessment of the potential impacts on Salmon as well as identification of an approach to work with First Nations to restore fish passage at BC hydro dams.	This interest is acknowledged; however, anadromous salmon are not included in the scope of the EA. Revelstoke Unit 6 project activities and operations will not preclude the ongoing potential for future fish passage or fish resource use of concern to First Nations. The Canadian Columbia River Intertribal Fisheries Commission (CCRIFC) has proposed the formation of a multiagency committee to start investigating the feasibility of salmon restoration in the Columbia. BC Hydro has agreed to participate in such a committee should it proceed		
FN-STS-21	2015, January		Sexqéltkemc te Secwepemc	Mammals	The proposed Mammals VC should include the impacts to the Caribou populations in the area, both in the short and long term.	A discussion of effects of REV6 on Caribou is included in the EA.		A discussion of effects of REV6 on Caribou is included in the EA. See Section 4.7 of the dAIR
FN-STS-22	2015, January		Sexqéltkemc te Secwepemc	Cultural Heritage	In terms of considering what impacts there are to Secwepemc title and rights, current practises must be taken into account as well as traditional and customary practices of our cultural.	Agreed, will be discussed in Part C.		
FN-STS-3	2015, January		Sexqéltkemc te Secwepemc	Assessment Methodology	Consider the effects of erosion and sedimentation on habitat degradation. Current studies on erosion and sedimentation resulting from BC Hydro operations should be expanded as they are currently limited in scope (i.e. number and location of sites). Rational: Increased erosion and sedimentation can result in fish habitat degradation, particularly with respect to spawning habitats. Anecdotal evidence suggests there are several highly eroding sites that are not currently included in BC Hydro monitoring programs. ***(Baseline Table, PA-MC, Sub component-Whitefish, Rainbow Trout, White Sturgeon, Bull Trout, Burbot)***	Changes in habitat quality and quantity is an indicator under the Fish and Fish Habitat VC and includes substrate composition and sediment concentrations.		Changes in habitat quality and quantity is an indicator under the Fish and Fish Habitat VC and includes substrate composition and sediment concentrations. All the indicators are listed in Table 2 Section 3.1 of the dAIR
FN-STS-4	2015, January		Sexqéltkemc te Secwepemc	Assessment Methodology	Conduct site-specific fisheries assessments to determine presence/absence. Rational: Site specific assessments in reaches immediately adjacent to the project have not been conducted and there is some uncertainty in whether or not these reaches contain fish. *(Baseline Table, PA-TC, Sub component-Rainbow Trout, Brook Trout)*	Site-specific assessments have been conducted in Revelstoke reservoir and MCR. There are no streams in the Transmission area.		
FN-STS-5	2015, January		Sexqéltkemc te Secwepemc	Assessment Methodology	Improve knowledge and studies on the effects of Rev 5 operations on bird abundance and diversity in order to determine the potential effects of Rev 6 operations. Rational: There seems to be much uncertainty in the results, trends, and causes with respect to ongoing studies on bird abundance and diversity *(Baseline Table, PA-Dam/MC, Sub component-Federal and Provincial listed species , Migratory Birds, Raptors)*	Current baseline conditions were described using available information provided in relevant reports (e.g., CLBMON 36, 39, 40) that help us understand diversity and seasonal use in the areas potentially affected by the Project. Site specific data was supplemented with other existing information and is considered sufficient to understand the potential effects of the Project.		Current baseline conditions were described using available information provided in relevant reports (e.g., CLBMON 36, 39, 40) that help us understand diversity and seasonal use in the areas potentially affected by the Project. Site specific data was supplemented with other existing information and is considered sufficient to understand the potential effects of the Project.See Section 4.6 of the dAIR.
FN-STS-6	2015, January		Sexqéltkemc te Secwepemc	Assessment Methodology	Improve ongoing studies the effects of changes in water levels and reservoir operations on amphibians, particularly with respect to determinations of the biological significance of these changes. Rational: The biological significance of changes in water level and reservoir operations on amphibian abundance, mortality, and site occupancy is currently unknown. Such a circumstance makes it difficult to determine the significance of further changes/impacts. ***(Baseline Table, PA-Dam/MC, Sub component-Federal and Provincial listed amphibian species ,Federal and Provincial listed reptile species)***	Current baseline conditions will be described using available information provided in relevant reports (e.g., CLBMON 37) which provide information on diversity and seasonal use in the areas potentially affected by the Project		Current baseline conditions will be described using available information provided in relevant reports (e.g., CLBMON 37) which provide information on diversity and seasonal use in the areas potentially affected by the Project See Section 4.5 of the dAIR.
FN-STS-7	2015, January		Sexqéltkemc te Secwepemc	Assessment Methodology	Include a furbearer(s) to the list of sub-components under this VC. These species should be water level dependent and culturally important (e.g. beaver and/or muskrat) Include Caribou to the list of sub-components Rational: Furbearer(s) have not been considered or assessed. *(Baseline Table, PA-Dam/MC, Sub component-Federal and Provincial listed species, Ungulates)*	Caribou are included as a sub-component in mammals as a federal and provincial listed species and an ungulate. Furbearers are included in the Mammals VC and have been included in Section 4.7 of the assessment. The following wording has been included under the sub-component Traditional Use and Knowledge: "Furbearers have been identified as species of cultural or economic importance to First Nations".		Within the Mammals Section (Section 4.7) the sub-components include Mammal Species at Risk, Ungulates, and Traditional Use and Knowledge (species specifically identified by Aboriginal Groups that are of cultural or economic importance). Within the Traditional Use and Knowledge sub-component furbearers have been identified and a list of the species (17 in total) known or likely to occur within the Generation LSA is provided in Table 4.7-7 (found in the Description of Existing Conditions). Some of these furbearer species listed in Table 4.7-7 primarily use upland forested habitats and would rarely be found in the draw down zone. Species on the list that are closely associated with aquatic and shoreline habitats are beaver, muskrat, otter, mink, and raccoon. Potential effects to furbearers due to flooding is discussed in the Assessment of Potential Project-related Effects

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FN-STS-8	2015, January		Sexqéltkemc te Secwepemc	Assessment Methodology	Provide a summary of economic, training, and employment targets and results for First Nations via the Rev 5 and Mica 5/6 projects, including whether these targets were met (or not) and why. Include a specific measure of revenues, contract procurement, employment, training, and capacity building for each First Nation associated with the Rev 6 project. Conduct an assessment of the economic effects on First Nations due to the Rev 6 project. *(Baseline Table, PA-MC, Sub component-Economy Revenues (Regional & Provincial) Employment, Accommodation, Fishery)*	Section 5.2, Economy includes information regarding employment at Rev 5 disaggregated to show local and First Nation hiring. We will have regional assessment of economic effects . Project related oppurtunities Training, capacity building, procurement for First Nations needs to be directly discussed with BC Hydro. Specific assessment may fall in Part C. Section 5.2, Economy will include publically available information on economic development, income, occupations and training for the general population and Aboriginal population. The assessment will consider employment, employment income, procurement and training effects of the Project. BC Hydro understands information pertaining to First Nations rights based economy, preferred future economy, business development and procurement, income, quality, accessible and appropriate education and training and quality long-term employment will be presented in Part C. This information will		Section 5.2 of the EA (Economy) includes information regarding employment at Rev 5 disaggregated to show local and First Nation hiring. We will have regional assessment of economic effects . Project related opportunities Training, capacity building, procurement for First Nations needs to be directly discussed with BC Hydro. Specific assessment may fall in Part C. Section 5.2, Economy will include publically available information on economic development, income, occupations and training for the general population and Aboriginal population. The assessment will consider employment, employment income, procurement and training effects of the Project. BC Hydro understands information pertaining to First Nations rights based economy, preferred future economy, business development and procurement, income, quality
FN-STS-9	2015, January		Sexqéltkemc te Secwepemc	Assessment Methodology	Separate Cultural Heritage and Archeology as stand-alone VCs (See general comments for VC candidates) Improve current Reservoir Archeology Programs (RAP) to provide more comprehensive and representative information on archeological sites and the resulting impacts due to BC Hydro operations. Specific measures and targets for erosion and water level fluctuations should be developed and linked to the ongoing impacts on archeological sites. These studies should include indigenous knowledge and assessment of the effects from an aboriginal perspective. *(Baseline Table, PA-RR, Sub component-Locations with protected archaeological or historical sites, features and artifacts)*	Agree. 'First Nations Cultural Heritage' will be assessed by First Nations in Part C of the Application. 'Historical and Archaeological Heritage' will be assessed in Part B. Comments specific to the RAP will be provided to the BC Hydro RAP coordinator to share with the Columbia Technical Working Group for consideration.		Agree. 'First Nations Cultural Heritage' will be assessed by First Nations in Part C of the Application. Historical and Archaeological Resources is included in Section 7 of the dAIR Part B. Comments specific to the RAP will be provided to the BC Hydro RAP coordinator to share with the Columbia Technical Working Group for consideration.
FN-TteS-1	2015, January		Tk'emlúps te Secwépemc	Economic	1) Project benefits do not address interests and opportunities (e.g. Revenue Sharing) for TteS and the other Secwepemc Communities. 2) Ttes requets capacity funding to retain experts and legal counsel for adequate and transparent review. 3) Potential issues include, but are not limited to, trespassing, damages, and questionable consent. Impacts include dislocation, livelihood, food supply, loss of fisheries resources, decreased property value, opportunity costs, loss of cultural practise (e.g. subsistence and cultural experience). 4) For component cumulative effects assessment, TteS requires technical experts to evaluate projects impacts. A conservative estimate of funding requirements for the environmental and socioeconomic review is 20-25 percent of the cost to produce the Environmental Assessment application.	SANDIE Capacity funding has been provided for participation in consultation activities and for the preparation of Part C. 1)BC Hydro does not have a mandate to discuss revenue sharing from the Province 2) Capacity funding is available for First Nations identified in the BCEAO Section 11 Order 3)To be discussed in Part C. 4) Capacity funding is available for First Nations identified in the BCEAO Section 11 Order		Capacity funding has been provided for participation in consultation activities and for the preparation of Part C.
FN-TteS-10	2015, January		Tk'emlúps te Secwépemc	Ecological Communities	<u>Existing Conditions – Generating Station</u> Measure the importance of current anthropological disturbance, including fragmentation at the spatial scale of both RSA and LSA. Spatial scale for the generating station is to include lands required for generating station footprint, transmission lines and Right of Way.	Acknowledged. One of the methods for describing Ecosystem Health and Function is to measure the extent of current anthropogenic disturbance including fragmentation. Spatial scale includes land for generation station footprint (no new footprint required). No new transmisson line is required, however footprint for the capacitor station is included in the assessment.		Acknowledged. One of the methods for describing Ecosystem Health and Function is to measure the extent of current anthropogenic disturbance including fragmentation. Spatial scale includes land for generation station footprint (no new footprint required). No new transmisson line is required, however footprint for the capacitor station is included in the assessment. Please see Section 4.3 of the dAIR.
FN-TteS-11	2015, January		Tk'emlúps te Secwépemc	Birds	<u>Effects Assessment</u> Sensory disturbance to birds is to be addressed during both construction and operations phases. For select VCs, habitat impacts are to be assessed and quantified for habitats specific to unique life history characteristics (e.g. nesting, staging).	Acknowledged. Sensory disturbance to birds will be considered for construction and operations phases and timing of seasonal use.		The Application will consider sensory disturbance to birds for construction and operations phases, and timing of seasonal use. The potential for noise generated by construction activity may cause disturbance and displacement of wildlife was identified in issues scoping, as summarized in Table 1 of Appendix A of the dAIR, and resulted in identification of Noise as an IC per Table 2 of Section 3.1 of the dAIR. The effects pathway for Noise to affect birds is set out in Table 3 of Appendix A of the dAIR.

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FN-TteS-12	2015, January		Tk'emlúps te Secwépemc	Herptiles	Sensory disturbance to herptiles is to be addressed during both construction and operations phases. For select VCs, habitat impacts are to be assessed and quantified for habitats specific to unique life history characteristics (e.g. breeding, hibernation).	Acknowledged. Displacement and disturbance to herptiles will be considered for construction and operations phases and timing of seasonal use.		The Application will consider sensory disturbance to herptiles for construction and operations phases, and timing of seasonal use. The potential for noise generated by construction activity may cause disturbance and displacement of wildlife was identified in issues scoping, as summarized in Table 1 of Appendix A of the dAIR, and resulted in identification of Noise as an IC per Table 2 of Section 3.1 of the dAIR. The effects pathway for Noise to affect herptiles is set out in Table 3 of Appendix A of the dAIR.
FN-TteS-13	2015, January		Tk'emlúps te Secwépemc	Mammals	<u>Existing Conditions – Generating Station</u> The ability for sub-adult and juvenile individuals to disperse to new environments impacts population viability and recovery. The application will describe the studies undertaken and characterize the existing conditions: o Natal dispersal	The addition of the sixth unit will result in construction at the Dam itself. Construction support areas for storage and staging may use up to 6.7 ha of land within BC Hydro's fenced property boundary. These areas were heavily disturbed by previous construction, and are subject to on-going vegetation management. The area disrupted by construction is too small to consider natal dispersal at the population level, and the size of the disturbance is not anticipated to have a measurable impact to mammal populations. Mammal species present within the draw down zone (Draw Down Zone (DDZ)) use habitats that have developed in response to existing reservoir operations and revegetation programs, or have been created or altered via anthropogenic disturbance. Large variations currently occur in both the daily amount of water released from Revelstoke Dam and the maximum elevation (and associated timing and duration) of the Arrow Lakes		
FN-TteS-14	2015, January		Tk'emlúps te Secwépemc	Mammals	<u>Existing Conditions – Transmission Facility</u> The ability for sub-adult and juvenile individuals to disperse to new environments impacts population viability and recovery. The application will describe the studies undertaken and characterize the existing conditions: o Natal dispersal	The total area of the capacitor site is anticipated to be 1.4 ha, and much of this area overlaps the existing transmission line. The area is too small to consider natal dispersal at the population level and the size of the disturbance is not anticipated to have a measurable impact to mammal populations.		
FN-TteS-15	2015, January		Tk'emlúps te Secwépemc	Mammals	<u>Effects Assessment</u> Sensory disturbance to mammals is to be addressed during both construction and operations phases. For select VCs, habitat impacts are to be assessed and quantified for habitats specific to unique life history characteristics (e.g. foraging, hibernation).	Acknowledged. Displacement and disturbance to mammals will be considered for construction and operations phases and timing of seasonal use. Agreed, habitats impacts will be assessed in consideration of life history characteristics.		The Application will consider sensory disturbance to mammals for construction and operations phases, and timing of seasonal use. The potential for noise generated by construction activity may cause disturbance and displacement of wildlife was identified in issues scoping, as summarized in Table 1 of Appendix A of the dAIR, and resulted in identification of Noise as an IC per Table 2 of Section 3.1 of the dAIR. The effects pathway for Noise to affect mammals is set out in Table 3 of Appendix A of the dAIR.
FN-TteS-2	2015, January		Tk'emlúps te Secwépemc	Economic	We have listed a few concerns and issues regarding retribution for past wrongs from Mica Dam. However, there needs to be capacity funding moving forward with these issues. Funding requirements for critical technical review are necessary to provide a cost estimate to current and past impacts. If left the natural world and the tribe was allowed to develop culturally and economically. This would allow time to demonstrate that TteS and the Secwepemc communities as a whole would be in a better place. Having present access the resources that the Dam destroyed and not having suffered all of those cultural impacts.	Capacity funding is available for First Nations identified in the BCEAO Section 11 Order		Capacity funding has been provided for participation in consultation activities and for the preparation of Part C.

REV6 Comments Tracking Table
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FN-TteS-3	2015, January		Tk'emlúps te Secwépemc	Economic	We object to the consultation process and changes to the EA process that exclude a full panel review.Tabulating issues and concerns prior to submission is not enough. Inclusion in the process through partnerships for activities not limited to archeological protection, environmental concerns, revenue sharing and taxation. We reiterate there is no mention of potential interests and opportunities for TteS and the Secwepemc. Imperative to such concerns is proponent funded agreements for employment opportunities, First Nation business contracts, and TteS representation in Project development planning.	The regulatory process is based on the thresholds and scope established by provincial and federal agencies. This project does not meet the criteria for a panel review. The Application will specifically identify interests as they pertain to individual FN.		The regulatory process is based on the thresholds and scope established by provincial and federal agencies. This project does not meet the criteria for a panel review. The Application will specifically identify interests as they pertain to individual FN in Part C. Capacity funding has been provided to Secwepemc bands identified in Schedule C of the Section 11 Order to support their meaningful participation in the EA process. BC Hydro is in discussions regarding proposed mitigation measures that will enhance opportunities for Secwepemc individuals and businesses to benefit from the Rev 6 Project.
FN-TteS-4	2015, January		Tk'emlúps te Secwépemc	Rephrasing	Section 3.2.2 second bullet reads, 'proposed process for attempting to resolve any outstanding issues." Please change the wording to "proposed process for working towards resolving any outstanding issues." Accomodation needs to be considered, in new case law this is a requirement.	The wording has been changed to reflect the new language in the EAO template.		
FN-TteS-5	2015, January		Tk'emlúps te Secwépemc	Evaluation of Residual Project Effects	For select Valuable Components VCs, quantify project-induced habitat loss via spatial analysis (e.g. FRAGSTATS, ALCES).	Project-induced habitat loss will be quantified for select VCs through spatial analysis of existing mapping provided in ongoing WUP studies (e.g., CLBMON 33, 36, 40) and modelling work.		Project-induced habitat loss will be quantified for select VCs through spatial analysis of existing mapping provided in ongoing WUP studies (e.g., CLBMON 33, 36, 40) and modelling work. See Section 4.3 of the dAIR
FN-TteS-6	2015, January		Tk'emlúps te Secwépemc	Cumulative Effects	For select VCs, quantify cumulative habitat loss from pristine baseline conditions via spatial analysis (e.g. FRAGSTATS, ALCES). For cumulative effects assessment, pristine baseline conditions pre-empt: o Mica Dam and Generating station, units 1-6 o Revelstoke Dam and Generating Station, units 1-5 o Hugh Keenleyside Dam and its effect on Arrow Reservoir	BC Hydro will assess if and how Mica, Revelstoke, and Hugh Keenleyside Dams (existing units) have affected or are affecting each VC. BC Hydro will conduct a cumulative effects assessment (CEA) for all VCs for which there is an incremental residual effect.		BC Hydro will assess if and how Mica, Revelstoke, and Hugh Keenleyside Dams (existing units) have affected or are affecting each VC. BC Hydro has conducted a cumulative effects assessment (CEA) for all VCs for which there is an incremental residual effect. See Section 3.10 of the dAIR.
FN-TteS-7	2015, January		Tk'emlúps te Secwépemc	Fish	<u>Introduction</u> - Calculate biomass statistics for subsistence harvest species.	Related to biomass; relative abundance, condition and species eveness are indicators in the Fish and Fish Habitat VC.		Biomass-related Indicators relative abundance, condition, and species eveness are included for both the Commercial / Recreational / Aboriginal (CRA) fisheries and Listed Species sub-components of the Fish and Fish Habitat VC in Table 2 of Section 3.1, and in Section 4.2 of the dAIR. Subsistence harvest fisheries are considered in the Aboriginal fisheries component of the CRA sub-component. Relative abundance and species evenness provide information pertaining to species composition, condition provides information on fish lengths and weights. Additional information pertaining to subsistence species from the perspective of Schedule C First Nations may be provided in Part C of the Application.
FN-TteS-8	2015, January		Tk'emlúps te Secwépemc	Fish	<u>Effects Assessment</u> Address sensory disturbance to fish during both construction and operations phases. For select VCs, habitat impacts are to be assessed and quantified for habitats specific to unique life history characteristics (e.g. spawning, juvenile rearing).	Sensory disturbance for fish species is assessed as interference with cues, e.g. migration, spawning cues, etc. that are afffected by indicators such as temperature or hydrology. This will be addressed in the Application for construction activities and operations. Quality and quantity of fish habitat is included as an indicator under the VC Fish and Fish Habitat.		Sensory disturbance for fish species is assessed as interference with cues, e.g. migration, spawning cues, etc. that are afffected by indicators such as temperature or hydrology. This will be addressed in the Application for operations. Temperature and hydrology will not be affected by construction. Quality and quantity of fish habitat is included as an indicator under the VC Fish and Fish Habitat in Section 4.2. Indicators are listed in Table 2 of Section 3.1 of the dAIR.
FN-TteS-9	2015, January		Tk'emlúps te Secwépemc	Ecological Communities	<u>Introduction</u> The assessment of ecological community sub-components is to be consistent between all unique communities. Sub- component's to be assessed should include: o Sensitive Ecosystems o Provincially-listed Ecosystems o Ecosystem Health and Function o Traditional Use and Knowledge	Acknowledged. The assessment of sub-components will be consistent. The following sub-components will be addressed: sensitive ecosystems, provincially-listed ecosystems, ecosystem health and function for biodiversity, and traditional use and knowledge.		Acknowledged. The assessment of sub-components will be consistent. The following sub-components will be addressed: sensitive ecosystems, provincially-listed ecosystems, ecosystem health and function for biodiversity, and traditional use and knowledge. The sub-components are listed in Table 2 of Section 3.1 of the dAIR.

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FN-WFN-1	2015, January		WESTBANK First Nation	EAO Process	A number of problems with the exiting EAO process can be identified. WFN is troubled by the Environmental Assessment legislation. The BC Environmental Assessment Act lackes a number of important aspect, regarding First Nations involvement in the process, objectives, standards and principles for delivery, and methods for the conduct of reviews. Further, the EA process is not within the pathway to consent.	The BC Hydro EA team acknowledges Westbank First Nation's statement concerning the EAO process.		
FN-WFN-2	2015, January		WESTBANK First Nation	VC Identification	An integral part of the EAO process is the identification of Valued Components("VC") which in turn forms the primary focus and foundation for an environmental assessment ("EA"). BC Hydro has given a deadline of April 16th, 2015 to respond to its draft VC document. In our View, VCs are neither conducive to nor respectful of maintaining and nurturing the enduring relationship BC Hydro enjoys with the Okanagan Nation including Westbank First Nation. VCs are based on methods that are tangible and quantitative in nature and rooted in western scientific methods and are unable to capture the Okanagan worldview. There is no space within the EA to adequately and meaningfully conduct the qualitative analysis that the Westbank Nation requires.	The BC Hydro EA team acknowledges Westbank First Nation's statement concerning the EAO process and the Okanagan World View.		BC Hydro has continued to discuss all aspects of this application with the Okanagan Nation.
FN-WFN-3	2015, January		WESTBANK First Nation	VC Identification	VCs are problematic on multiple levels and can have far reaching negative implications such as preventing adequate measure for cumulative impacts.	Comment noted		
FN-WFN-4	2015, January		WESTBANK First Nation	Assessment Methodology	The assessment process that BC Hydro undertakes for its proposed projects must include a bilateral progression that is rooted in the principles laid out in the Enduring relationship.	Acknowledged.		
FN-WFN-5	2015, January		WESTBANK First Nation	Process commitment	Further, we are asking BC Hydro to solidify its commitment to conduct a separate, parallel process that will ensure the review of the Revelstoke Unit 6 project is inclusive of our views, concerns and requirements to making an informed decision.	BC Hydro and Okanagan established a parallel process for the review of Revelsoke 6.		
	2015, January		Shuswap IB		Locations of the plants and how close they are to rising water levels and if at risk	Available information was reviewed for baseline information on known locations of plant communities (from habitat mapping) and rare species. Sources include CLBMON 12 and 33. Information provided by First Nations was included in the baseline.		Available information was reviewed for baseline information on known locations of plant communities (from habitat mapping) and rare species. Sources include CLBMON 12 and 33. Information provided by First Nations was included in the baseline. See Section 4.6 of the dAIR
	2015, January		Shuswap IB		Impacts to Caribou populations in the area, both in short and long term	A discussion of effects of REV6 on Caribou is included in the EA.		A discussion of potential effects of REV6 on Caribou is included in the Application. Caribou will be included in the assessment as set out in Table 2 and Section 4.7.2 of the dAIR.