Treaty 8 Tribal Association

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Dear Ms. Saely and Mr. Murphy,

Thank-you for providing the Treaty 8 First Nations ("T8FNs") with a copy of the Draft Environmental Impact Statement ("EIS") Guidelines for the proposed Site C Project.

The T8FNs have reviewed the Draft EIS Guidelines, and are providing these comments for further discussion with the Crown and with the proponent, BC Hydro. In general, the EIS Guidelines lay out some positive and workable approaches for this assessment. At other times, they appears to deviate substantially from established practice and do not frame an approach that will be effective in assisting in the determination of effects on asserted Aboriginal rights, established Treaty rights, and interests. Our general concerns are described below, with specific concerns tracked in a table attached to this letter.

GENERAL COMMENTS

Role of the CEAA and CEA Agency Policy in Cooperative Environmental Assessments with British Columbia

With the signing of the JRP Agreement in February 2012, the federal and provincial governments agreed on a cooperative process to assess the environmental effects of the proposed Site C Project.

Based on the Canada-British Columbia Agreement for Environmental Assessment Cooperation (2004), the lead party for this environmental assessment is British Columbia.[1] The designation of British Columbia as the lead party has implications for how the environmental assessment will be carried out, and how the information requirements (i.e. the EIS Guidelines) need to be prepared:

> *"Cooperative environmental assessment" means the environmental assessment of a project where Canada and British Columbia both have an environmental assessment responsibility and they cooperate through the Lead Party's assessment process, to meet the legal environmental assessment requirements of both Parties through a single environmental assessment.*[2]
>
> *The Parties will make every reasonable effort to agree, as early in the review as practicable, and, where British Columbia is the lead Party, no later than the finalization of information requirements for the application on a common set of information requirements to allow both Parties to fulfill their respective environmental assessment responsibilities and to produce a single environmental assessment report.*[3]

Our understanding, based on the above, is that the BC EAO Application Information Requirements Template forms the starting point for the development of the information requirements for the assessment, and this Template is augmented to address federal requirements. This understanding is consistent with Agency policy outlined in Guidelines for the Preparation of an Environmental Impact Statement for the Comprehensive Study Process Pursuant to the *Canadian Environmental Assessment Act* (the "CEAA Guidance Document"):

> *In situations where there is a coordinated federal/provincial environmental assessment (EA) being conducted and the province is the lead Party, these Guidelines [i.e. the*

[1] Government of Canada and British Columbia. March 11, 2004. Canada-British Columbia Agreement for Environmental Assessment Cooperation, at p.5.

[2] *Ibid*, at p.1.

[3] *Ibid*, at p.4.

CEAA Guidance Document] are meant to complement rather than duplicate any provincial specific guidelines or terms of reference.[4] *(our underlining)*

In "complementing" the Province's specific guidelines or terms of reference, the Draft EIS Guidelines are to address those matters contained in the CEAA Guidance Document and in the *Canadian Environmental Assessment Act* (the "*CEAA")* in a manner that complements and does not duplicate the information requirements of the BC EAO Application Information Requirements Template.

While the above appears to provide relatively straightforward advice for the preparation of the Draft EIS Guidelines, there are several concerns with the actual content of the Draft EIS Guidelines. These are discussed below.

Limited Consideration of the CEAA and Agency Policy

In preparing the Draft EIS Guidelines, BC Hydro has relied exclusively on the BC EAO Template. BC Hydro acknowledged this at the Working Group meeting on March 1 in Fort St. John. This approach is inconsistent with the Agreement on EA Cooperation, contrary to CEAA policy and, unaddressed, would result in Final EIS Guidelines that do not meet the requirements of the *CEAA*. Importantly, these EIS Guidelines are substantially different from those for other similar projects within Canada, including competing energy projects within British Columbia.[5] This sets a double standard in which there is one set of rules for a Provincial Crown proponent and a second set of rules for everyone else.

Throughout our comments, we have attempted to indicate instances where the requirements of the CEAA Guidance Document need to be addressed in the Draft EIS Guidelines. However, we anticipate that the federal Agencies and Responsible Authorities will undertake a thorough review of the Draft EIS Guidelines to ensure that CEAA policy is addressed and the requirements of the *CEAA* are met.

Aboriginal Traditional Knowledge

The Terms of Reference for the JRP Agreement scope thirteen factors for consideration in the environmental assessment.[6] All of these factors are scoped in the Draft EIS Guidelines, with the exception of "community knowledge and Aboriginal traditional knowledge". For reasons that are unclear, the Draft EIS Guidelines make no effort to scope this factor, making only a single mention of it (in s.8.5.2).

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[4] CEAA. 2011. Guidelines for the Preparation of an Environmental Impact Statement for the Comprehensive Study Process Pursuant to the *Canadian Environmental Assessment Act*, at p.1.

[5] See " BC EAO and CEAA. March 2009. Bute Inlet Hydroelectric Project. Proposed By Bute Hydro Inc. Terms of Reference for an Application for an Environmental Assessment Certificate Pursuant to the British Columbia *Environmental Assessment Act* and Guidelines for the Preparation of an Environmental Impact Statement Pursuant to the *Canadian Environmental Assessment Act*.

[6] Agreement To Conduct a Cooperative Environmental Assessment, Including the Establishment of a Joint Review Panel, of the Site C Clean Energy Project Between The Minister of the Environment, Canada and The Minister of Environment, British Columbia. February 2012, at p.14.

Aboriginal traditional knowledge is integral to the assessment process. The Draft EIS Guidelines do not currently provide any role for Aboriginal traditional knowledge. This deficiency could be addressed as follows:

- by including Aboriginal traditional knowledge as a guiding principle for the environmental assessment, consistent with other environmental assessments in Canada
- by incorporating and considering Aboriginal traditional knowledge throughout the environmental assessment and the preparation of the EIS, not only in the context of Chapters 15 and 20 of the EIS, as currently proposed in the Draft EIS Guidelines

"Guiding Principles" are addressed below, and we have identified in the Draft EIS Guidelines where Aboriginal traditional knowledge could be relevant to the environmental assessment.

Guiding Principles

It is standard practice for EIS Guidelines to include guiding principles to provide adequate direction to the proponent and Panel in conducting the assessment, and to government agencies, interveners, Aboriginal groups and the public in reviewing the EIS and participating in the assessment. Examples of core principles from recent environmental assessments are summarized in Table 1 below.

Since BC Hydro did not consider the CEAA Guidance Document when preparing the draft EIS Guidelines, principles are not included. The CEAA Guidance Document provides language for inclusion in the Draft EIS Guidelines in relation to each of the principles contained in Table 1, with the exception of "recognition of Treaties and/or land claims". We are requesting that a section entitled Guiding Principles be included in Section 1 of the Draft EIS Guidelines and include the following:

- Environmental Assessment as a Planning Tool
- Public Participation
- Aboriginal Consultation
- Aboriginal Traditional Knowledge and Community Knowledge
- Sustainable Development
- Precautionary Approach
- Use of Existing Information
- Recognition of Treaties

We request that the language for the first seven Guiding Principles be taken directly from sections 2.1 through 2.7, inclusive of the CEAA Guidance Document.[7] We are proposing the following language for Recognition of Treaties:

> *Treaty 8 governs the relationship of aboriginal people to the land where the Project will be located. Treaty 8 covers northeastern British Columbia, two-thirds (2/3) of Alberta,*

[7] CEAA. 2011. Guidelines for the Preparation of an Environmental Impact Statement for the Comprehensive Study Process Pursuant to the *Canadian Environmental Assessment Act*, at p.1-5.

northwestern Saskatchewan, and a large portion of the southern and southeastern Northwest Territories. The Crown's promises under the Treaty included that the Indians would have the same means of earning a livelihood after the Treaty as existed before it; that the Indians would be as free to hunt and fish after the Treaty as they would be if they never entered into it; and that the Treaty would not lead to "forced interference with their mode of life. Five Treaty 8 First Nations in northeastern British Columbia are engaged with the federal and provincial governments in negotiations to settle their outstanding Treaty Land Entitlement claims. These negotiations will result in the creation of new Treaty 8 reserve lands in northeastern British Columbia and northwestern Alberta.

Table 1: Typical Environmental Assessment Principles

Project	EA as a Planning Tool	Aboriginal and Public Consultation	Aboriginal Traditional and Community Knowledge	Sustainable Development	Precautionary Principle	Use of Existing Information	Recognition of Treaties and/or Land Claims
Bute Inlet Hydro		X	X	X	X	X	
Mackenzie Pipeline			X	X	X		X
Marathon Mine	X		X	X	X		
Darlington Nuclear	X	X	X	X	X	X	
Eastmain Hydro	X	X	X	X			X
Lower Churchill	X	X	X	X	X		

Need, Purpose and Alternatives to the Project

Need and Purpose

Section 4.3 states the proposed purpose of the Project as follows:

> *The purpose of the Project is to maximize the development of the hydroelectric potential of the Peace River between BC Hydro's Peace Canyon generating station and the site of the proposed Site C dam and generating station in a cost effective manner.*

As stated in s.4.1 of the Draft EIS Guidelines, the "need for the Project will be demonstrated using BC Hydro's most recent load-resource balance"…and the "EIS will present the need for the Project in terms of forecasted electricity demand and in economic terms…"

Clearly, the "need" that forms the rationale for the Project is one for electricity and not one for "maximizing the development of the hydroelectric potential of the Peace River." This is also evident from the 1980 EIS:

> *The Peace Site C hydro project is proposed by B.C. Hydro to meet [electricity] load*

growth deficits...[8]

Since the purpose of the Project provides the context for consideration of alternatives, the Draft EIS Guidelines as written would preclude all alternatives that did not "maximize the development of the hydroelectric potential of the Peace River between BC Hydro's Peace Canyon generating station and the site of the proposed Site C dam and generating station". This would mean all supply alternatives not located on the Peace River could not fulfill the "purpose" of the Project.

With respect to "cost effectiveness", BC Hydro's vision, objectives, and values include six core objectives, as follows:

[1] Safely Keep the Lights On

- Reliably meet the electricity needs of our customers through integrated planning, technology and safely operating, maintaining and advancing our system.

[2] Succeed Through Relationships

- Gain support for our work by building trusted relationships with customers, suppliers, First Nations and the communities we serve.

[3] Mind Our Footprint

- Create a sustainable energy future in British Columbia by carefully managing our impacts on the environment and fostering an energy conservation and efficiency culture.

[4] Foster Economic Development

- Foster economic development opportunities across B.C. through our projects, practices and advancement of the clean energy sector.

[5] Maintain Competitive Rates

- Deliver value for B.C. and maintain competitive rates by efficiently and responsibly managing our business.

[6] Engage a Safe and Empowered Team

- Empower a team that is innovative, prepared for the future and committed to safety

The inclusion of the phrase "in a cost-effective manner" supports objective 5, and to some extent objectives 1 and 6, but excludes objectives 2, 3 and 4. Since s.4.1 of the Draft EIS Guidelines already requires the EIS to describe how the Project addresses BC Hydro's vision, objectives, and values, the inclusion of this phrase "in a cost-effective manner" in the purpose is not necessary.

We request that the purpose of the Project be written to reflect the actual need it is intended to address, in a manner consistent with BC Hydro's own corporate objectives:

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[8] BC Hydro. July 1980. Peace Site C Project Environmental Impact Statement. Report No. SE 7910. System Engineering Division.

The purpose of the Project is to generate, transmit and supply electricity to meet the need for electricity in British Columbia.

Alternatives to the Project

The EIS Guidelines make reference to the requirements of the Clean Energy Act with respect to assessment of the need and alternatives to the Project. We note, for the consultation record, that we were not consulted on the *Clean Energy Act* prior to its enactment. This is relevant because of the severe restrictions put in place by the *Act* that limit the consideration or development of feasible alternatives to the proposed Site C Project. The *Act* is designed such that inclusion of Site C within the preferred portfolio of the Integrated Resources Plan to meet the potential future electricity needs of the Province is substantially encouraged. We note, among many examples:

- all of the large-scale hydro-electric projects contemplated in the 2008 Long-term Acquisition Plan (LTAP) have been excluded from further consideration in Schedule 2 of the *Act*;
- section 3(5) of the *Act* requires that BC Hydro must plan to rely on no energy and no capacity from the existing Burrard natural gas facility, except in the case of emergency or as authorized by regulation; and
- the self-sufficiency requirements in section 6 of the *Act* make it impossible for BC Hydro to meet customer requirements with imported electricity.

The purpose as framed in the Draft EIS Guidelines casts different hydroelectric schemes on the Peace River as "alternative means" rather than "alternatives to" the proposed Project. As with alternatives to the Project, the alternatives means are limited to those that "maximize the hydroelectric potential of the Peace River between BC Hydro's Peace Canyon generating station and the site of the proposed Site C dam and generating station". Such an approach would mean that smaller-scale hydroelectric developments on the Peace River would not even be considered since they would not meet the "maximization" criterion. We view this as further rationale for changing the stated purpose of the Project in the Draft EIS Guidelines.

Valued Components

The BC EAO and CEAA policy documents take somewhat different approaches to dealing with valued components. However, neither the BC EAO nor CEAA policy documents require the identification or finalization of valued components within EIS Guidelines.

The BC EAO Template for the preparation of Draft Application Information Requirements indicates that:

- *A preliminary list [of VCs] must be provided in the AIR [i.e. Final EIS Guidelines] for purposes of discussion with EAO, CEAA and the Working Group.*[9]

The Proponent must commit to provide the following in the Application:

- *Describe the rationale for choosing and assessing the specific VEC;*

[9] BC EAO. October 4, 2010. Application Information Requirements Template: With Respect to an Application for an Environmental Assessment Certificate pursuant to the *Environmental Assessment Act,* S.B.C. 2002, C.43, at p.11.

- *Provide detailed baseline information on the VEC and the source of the information;*
- *Identify past, present or future projects/activities that may impact the VEC; and,*
- *Describe traditional ecological or community knowledge, where available.[10] (our underlining)*

The CEAA Guidance Document indicates the following:

> *The EIS Guidelines outline the minimum information requirements while providing the proponent with flexibility in selecting methods to compile data for the EIS.[11]*
>
> *The EIS must explain and justify methods used to predict the effects of the project on each VEC, which includes biophysical and socio-economic components, the interactions among these components and on the relations of these components within the environment.[12] (our underlining)*

The approach to valued components (VCs) outlined in the Draft EIS Guidelines appears to confuse what is required in the EIS Guidelines versus what is required in the EIS.

We are concerned by this approach, since it is our understanding that the Final EIS Guidelines will be "deemed to be incorporated into the JRP Agreement" upon their approval in late May. The JRP Agreement can only be changed by the Director of the EAO and the Minister, meaning that VCs would be locked-in for the duration of the environmental assessment, as changes are rarely made to a JRP Agreement.

Finalizing the valued components within the EIS Guidelines has the effect of determining the most important effects of the proposed Project *before* the effects assessment has even started.

This would have several negative consequences:

- **Incomplete project and baseline information**: VCs would be determined prior to public or Aboriginal consultation on details of the project components and activities as well as completed baseline information, since this information has not yet even been made completely available, so finalization of the VCs would thus occur in the absence of this important knowledge;
- **No impact pathway analysis**: VCs are normally determined following an impact pathway analysis or similar exercise designed to identify pathways or interactions between project components and activities and environmental components, such an exercise is not planned in relation to Treaty 8 First Nation issues and concerns until later this summer, after finalization of the EIS Guidelines;
- **Make everything a VEC or just guess**: Lacking an impact pathway analysis, the VCs must be either extremely generalized (e.g. "wildlife resources", "fish and fish habitat", etc.) as is

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[10] *Ibid*, at p. 15.

[11] CEAA. 2011. Guidelines for the Preparation of an Environmental Impact Statement for the Comprehensive Study Process Pursuant to the *Canadian Environmental Assessment Act*, at p.1.

[12] CEAA. 2011. Guidelines for the Preparation of an Environmental Impact Statement for the Comprehensive Study Process Pursuant to the *Canadian Environmental Assessment Act*, at p.12.

the case in the Draft EIS Guidelines or would need to be "best guesses" recognizing that they could not later be changed due to the "deemed incorporation" approach;

- **Unreasonable expectations**: In the absence of a completed baseline, detailed information on project interactions and an impact pathway analysis, it is not reasonable or appropriate to expect that Aboriginal groups or any other members of the Working Group could comment on the finalization of the proposed VCs for inclusion in the Final EIS Guidelines;
- **Meaningless consultation**: Once the VCs are finalized in the EIS Guidelines, It would be meaningless for Aboriginal groups or the public to participate in consultations concerning the effects assessment since the valued components and key indicators would already be finalized and unable to be changed;
- **Crown commitments not met**: Including final VCs in the EIS Guidelines would undermine regulatory commitments to timely and meaningful public participation and Aboriginal consultation throughout the environmental assessment process,[13] since it would deprive the public and Aboriginal groups of the ability to provide informed comments, and would therefore also deprive the Panel and decision-makers of the benefit of the best available information.

In summary, we view the proposed VCs and key indicators as preliminary, for illustrative purposes only, and open to further discussion and consultation throughout the environmental assessment. We have provided preliminary comments on that basis. We recognize and expect that the proponent will submit its understanding of the VCs and key indicators in the EIS.

We request that the VCs and the key indicators be either deleted from the Draft EIS Guidelines or included simply as a list of "suggested VCs" and "preliminary key indicators" with the caveat that "none of the suggested VC's in this list have been reviewed against the criteria for establishing those that will be included in the final assessment,"[14] an approach taken by the EAO in relation to the assessment of the Northwest Transmission Line, a recent BC Hydro project.

Spatial Boundaries

As with the proposed VCs, the inclusion of spatial boundaries in the Final EIS Guidelines is premature, contrary to established EAO and CEAA policy, and would have similar consequences, including for public participation and Aboriginal consultation.

The EAO template for the preparation of Draft Application Information Requirements indicates that:

> *The Proponent must commit to provide the following in the Application:*
>
> *• Describe the local and regional spatial extent of the EA relative to the VCs; and,*

[13] *CEAA*, s 4(1)(d).

[14] BC EAO. December 7, 2009. Northwest Transmission Line Proposed Project Application Information Requirements for an Application for an Environmental Assessment Certificate, at p.5-4.

- *Provide maps outlining the spatial extent of the regional and local study areas of the EA. (our underlining)*

The CEAA Guidance Document indicates the following:

> *Clearly indicate the spatial boundaries to be used in assessing the potential adverse and beneficial environmental effects of the proposed project. The EIS must contain a justification and rationale for all boundaries chosen. It is important to note that the special boundaries for each VEC may not be the same.*[15] *(our underlining)*

We view any spatial or temporal boundaries provided in the Draft EIS Guidelines as preliminary, for illustrative purposes only, and open to further discussion and consultation throughout the environmental assessment. We have provided preliminary comments on the spatial and temporal boundaries on that basis.

We request that any specific spatial boundaries be deleted from the Draft EIS Guidelines.

Cumulative Effects

Previous Projects and Activities

In order to assess the cumulative environmental effects of the proposed Project and the cumulative implications for Section 35(1) rights, the initial case for consideration or the "baseline case" must include the historical circumstances, since these circumstances are essential to the understanding of the seriousness of the potential impacts on established Treaty rights, and which circumstances would include the WAC Bennett Dam, Peace Canyon Dam and the Peace Project Water Use Plan.[16]

We note, for example, the conclusions of the recent Joint Review Panel Report for the proposed Lower Churchill Hydroelectric Generation Project:

> *Nevertheless, the Panel recognized the importance, common to all Aboriginal persons, of practicing traditional activities within the entire extent of their traditional territory and the fact that for many groups, any effect from the Project on their practice of traditional activities would act cumulatively with impacts caused by the development of the earlier Churchill Falls project. (our emphasis)*

The approach to the baseline case proposed by BC Hydro is identical to that proposed by Nalcor for the Lower Churchill Hydroelectric Generation Project. Here is what the Lower Churchill JRP had to say about the outcomes of the approach:

> *The Panel concluded that Nalcor's approach to cumulative effects assessment was less than comprehensive and that participants had raised valid concerns that contributed to a broader understanding of the potential cumulative effects of the Project. The Panel recognized the challenges involved, including limited information about past projects such as the Churchill Falls project, and the built-in disincentive for*

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[15] CEAA. 2011. Guidelines for the Preparation of an Environmental Impact Statement for the Comprehensive Study Process Pursuant to the *Canadian Environmental Assessment Act*, at p.12.

[16] West Moberly First Nations v. British Columbia (Chief Inspector of Mines), 2011 BCCA 247, at s.117.

proponents to identify adverse cumulative effects when they are perceived as a potential threat to project approval.

For the proposed Site C Project, the appropriate approach is to gather the available historical information pertaining to the WAC Bennett Dam and Peace Canyon Dam in order to create a pre-industrial (i.e. ~1950s) baseline, and to identify the limitations in this information. Such historical information could then be used to recreate, using modern mapping and related techniques and professional expertise and judgment, a picture of the ecosystem prior to construction of the WAC Bennett Dam and Peace Canyon Dam, and then determine the cumulative effects of the multiple projects and activities on the environment and on Section 35(1) rights. The information used to create the pre-industrial baseline would have been collected by BC Hydro in order to construct the WAC Bennett Dam or could be readily extrapolated from existing sources, and includes:

- historical air photos;
- geomorphological data;
- hydrological data;
- vegetation mapping;
- topographical maps;
- Aboriginal traditional knowledge;
- local knowledge; and
- historical documentation.

Complete Description of the Project for Assessment

We are concerned that the Project as proposed in the Project Description Report is not the entirety of "the scope of the project in relation to which an environmental assessment is to be conducted", as per Section 15 of the CEAA.

Specifically, the Proponent has omitted from the Project Description Report aspects of the "project in relation to which an environmental assessment is to be conducted", including:

- the flood reserve established in 1957 in the Peace River valley between Hudson's Hope and Taylor that is essential to the Project, and serves no purpose other than in relation to the development of the Project; and
- the transmission right of way on the south side of the Peace River through the Peace-Moberly tract established prior to 1980 for the purposes of developing the Project.

The project in relation to which an environmental assessment is to be conducted" must include the above aspects *at the time they were put into place*. This position is consistent with that put forward in BC Hydro's own documentation:

A primary mechanism for the Project's impact on land and resource use activities is its (actual or potential) displacement of these activities on the land base. For this reason the baseline focuses on the status of (actual or potential) land and resource use

activities in the Project footprint. The Project footprint for the purposes of this baseline is the proposed flood line, dam site area and transmission line ROW as presented in the initial application of 1980.[17] *(our underlining)*

We support the identification of the Future Case without the Project, provided that the Project is properly described, and particularly so that it includes removal of the flood reserve and transmission right of way describe above.

Future Projects and Activities

We are aware, based on materials filed in relation to the Integrated Resources Planning process and public statements by Premier Christy Clark, that the proposed Site C project is "needed" only in relation to the Province's proposed natural gas strategy. As such, eventual transmission infrastructure to natural gas load sources in the Horn River Basin and/or along the BC Coast are for all intents and purposes part of the "project in relation to which an environmental assessment is to be conducted".

We note that the Project Inclusion List is not consistent with CEAA policy, which states:

Cumulative effects are defined as changes to the environment due to the Project where those overlap, combine or interact with the environmental effects of other past, existing or reasonably foreseeable projects or activities.[18] *(our underlining).*

The Future Case without the Project and the Project Case need to include past and existing projects or activities as well as reasonably foreseeable projects, which would include not only those that are registered for environmental assessment but also those facilitated by the development of the proposed Project, or which are necessary for the development to fulfill its need.

Current Use of Lands and Resources by Aboriginal Persons

The *CEAA* defines "environmental effect" as including "any change that the project may cause in the environment, including any change it may cause to a listed wildlife species, its critical habitat or the residences of individuals of that species, as those terms are defined in subsection 2(1) of the Species at Risk Act" (2(a)) and "any effect of any [such] change on the current use of lands and resources for traditional purposes by aboriginal persons" (2(b)(iii)).

As such, wherever the *CEAA* requires evaluation of environmental effects, this will include analysis of the proposed Project's impact on "current use" of resources by aboriginal people for traditional purposes.

What is less clear in the *CEAA* is the intended meaning of the term "current use", or for that matter how information respecting "current use" should be documented. The CEAA Guidance Document also provides no direction on this issue.

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[17] Lions Gate Consulting Inc. December 2009. Volume B – Land and Resource Uses: Preliminary Socio-Economic Baseline and Effects Assessment Methodology. Site C Hydro Project. Prepared on behalf of BC Hydro.

[18] Government of Canada and Government of Newfoundland and Labrador. July 2008.Environmental Impact Statement Guidelines: Lower Churchill Hydroelectric Generation Project Newfoundland and Labrador Hydro, at p.35.

In terms of the BC environmental assessment requirements, the EAO template for the preparation of Draft Application Information Requirements provides clearer direction and indicates that:

> *The Proponent must commit to provide the following in the Application:*
>
> • *Identify past, present and anticipated future uses of the proposed project area by aboriginal groups*

As discussed above, in order for the assessment to provide valuable information for the assessment of the cumulative effects of the Project on asserted Aboriginal rights and existing Treaty Rights, the EIS Guidelines must conform to the requirements of the BC EAO template. Specifically, prior information must be gathered back to the late 1950s, and future uses must extend forward at least 20 years, a time period within which future uses can be reasonably predicted.

Based on the above information, we request that the "current use of lands and resources by Aboriginal persons for traditional purposes" be clarified to also include past and future uses. This interpretation could be included as a definition at the outset of the Draft EIS Guidelines, or noted in the context of each time this term is used. In our specific comments, we have suggested the latter approach, but a proper definition could also be appropriate.

Aboriginal Rights

The CEAA Guidance Document provides direction to proponents in preparing the EIS and conducting the environmental assessment, including the following:

> *To assist the federal Crown in its consultation process, the proponent is required to describe in the EIS how the concerns respecting Aboriginal people will be addressed. That description should include a summary of discussions, the issues or concerns raised, and should consider and describe any asserted or established Aboriginal rights, Aboriginal title and Treaty rights. The EIS must document the potential impact of the project on asserted or established Aboriginal rights, Aboriginal title and Treaty rights, and the measures to prevent, mitigate, compensate or accommodate those potential effects.*[19]
>
> *The proponent will include a consideration of… Measures that are technically and economically feasible and that would accommodate any adverse impact of the project on potential or established Aboriginal and Treaty rights;*[20]
>
> *VECs that fall outside the mandate of the EA may also be included in order to assess the potential adverse impact of the project on potential or established Aboriginal and Treaty rights.*[21]

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[19] CEAA. 2011. Guidelines for the Preparation of an Environmental Impact Statement for the Comprehensive Study Process Pursuant to the *Canadian Environmental Assessment Act*, at p.2-3.

[20] CEAA. 2011. Guidelines for the Preparation of an Environmental Impact Statement for the Comprehensive Study Process Pursuant to the *Canadian Environmental Assessment Act*, at p.11.

The EIS should outline for each Aboriginal group identified by the Crown:

- *…*
- *Description of the traditional territory and potential or established Aboriginal and Treaty rights that are exercised in relation to the assessment area;*
- *Potential adverse impacts to the Aboriginal rights resulting from the project;*
- *Proposed accommodation measures to avoid or mitigate the impacts to Aboriginal rights;*

The EAO template for the preparation of Draft Application Information Requirements indicates that:

The Proponent must commit to provide the following in the Application:

- *Identify past, present and anticipated future uses of the proposed project area by aboriginal groups*
- *Identify any specific asserted aboriginal rights (including title) about which the Proponent receives information from First Nations or other sources;*
- *Identify potential impacts of the proposed project on the uses and asserted rights identified by way of the preceding two bullet points*
- *For proposed projects which are situated within or close to geographical areas encompassed by existing treaties, identify the Treaty rights which could be impacted by the proposed project; and*
- *Describe mitigation measures to avoid or reduce such impacts.*[22]

In addition to the above materials, we have used the following two documents submitted previously to the Agency and the EAO to prepare our comments on matters related to Aboriginal rights in the Draft EIS Guidelines, including in relation to Section 20:

- Minimum Scope of Harvesting Rights Under Treaty No. 8, dated November 4, 2011
- Perspectives on Treaty 8 Land-based rights and duties: What Would Treaties Mean if We Took Indian Understandings Seriously? dated February 24, 2012

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[21] CEAA. 2011. Guidelines for the Preparation of an Environmental Impact Statement for the Comprehensive Study Process Pursuant to the *Canadian Environmental Assessment Act*, at p.12.

[22] BC EAO. October 4, 2010. Application Information Requirements Template: With Respect to an Application for an Environmental Assessment Certificate pursuant to the *Environmental Assessment Act,* S.B.C. 2002, C.43, at p.24.

In closing, we are available to discuss these comments at our scheduled meeting on the afternoon of Tuesday, March 27. We look forward to discussing the Draft EIS Guidelines and our comments at that time.

Sincerely,

[Original signed by]

Tribal Chief Liz Logan

Attachment – Comments on Draft Agreement
cc: Treaty 8 Chiefs
T8 – Shona Nelson, Jeff Richert

Environmental Impact Statement Guidelines for the Development of the Environmental Impact Statement to Satisfy Requirements of the Canadian Environmental Assessment Act and the British Columbia Environmental Assessment Act

EXCERPT FROM THE DRAFT EIS GUIDELINES	SPECIFIC COMMENTS, SUGGESTIONS OR QUESTIONS
PREFACE TO THE ENVIRONMENTAL IMPACT STATEMENT GUIDELINES	
British Columbia Hydro and Power Authority (BC Hydro), proposes to construct and operate the Site C Clean Energy Project (the Project[23]) as described in the Project Description Report (BC Hydro 2011 a). The Project will involve the construction and operation of a dam and hydroelectric generating station on the Peace River, in northeast British Columbia, downstream of the existing Williston Reservoir and Dinosaur Reservoir, and the	

[23] The Project and the proposed Project are used interchangeably for the sake of brevity.

respective BC Hydro generating facilities at G.M. Shrum and Peace Canyon.	
The Project will have an installed energy generating capacity of up to 1,100 megawatts, will require two new 500-kilovolt transmission lines adjacent to two existing 138-kilovolt transmission lines along approximately 77 kilometres of existing and widened right-of-way; will require a realignment of portions of Highway 29; and will involve the creation of new and the expansion of existing sand, gravel, and stone quarries. Each of these project aspects are reviewable under the *Environmental Assessment Act,* S.B.C. 2002, c. 43 (BCEAA), and the *Reviewable Projects Regulation*. Federal agencies have concluded that the Project will require approvals under the *Navigable Waters Protection Act* and the *Explosives Act* and authorizations under the federal *Fisheries Act,* triggering an environmental assessment under the *Canadian Environmental Assessment Act,* S.C. 1992, c. 37 (CEAA) (Agency 2007a). Responsible Authorities identified by the federal government are Transport Canada, Natural Resources Canada, and Fisheries and Oceans Canada, with input from Federal Authorities (e.g., Environment Canada, Health Canada, and Aboriginal Affairs and Northern Development Canada).	
In accordance with Section 15 of the CEAA, the Minister of Environment of Canada has determined that the scope of the Project in relation to which an environmental assessment will be conducted is the Project as proposed by BC Hydro in the Project Description Report and as it may be modified from time to time.	See comments below in relation to Section 3 Project Overview.
The Minister of Environment of Canada and the Minister of Environment of British Columbia have agreed to a cooperative environmental assessment of the Project, including the establishment of a joint review panel.	

The Joint Review Panel, after holding public hearings and evaluating the information included in the Environmental Impact Statement (EIS) and public hearings, will provide the Minister of Environment of Canada and the Executive Director of the Environmental Assessment Office of British Columbia with the Joint Review Panel Report which will summarize the Panel's rationale, conclusions and recommendations relating to the environmental assessment of the Project. The provincial Minister of Environment and the provincial Minister of Forests, Lands and Natural Resource Operations will determine whether an Environmental Assessment Certificate should be issued. The Governor in Council and the Responsible Authorities will determine which course of action will be taken.	
These EIS Guidelines are issued by Executive Director of the Environmental Assessment Office of British Columbia and, in accordance with Section 16 of CEAA, by the Minister of Environment of Canada, in order to set out the scope of the factors to be taken into consideration in the environmental assessment of the Project.	
For the purposes of the environmental assessment under CEAA and to serve as the Environmental Assessment Certificate (EAC) Application[24] for the Project, BC Hydro must provide an EIS. In this document, the information	

[24] The harmonized Environmental Impact Statement (EIS) and Environmental Assessment Certificate (EAC) Application will be collectively referred to as the Environmental Impact Statement or EIS.

which must be included in the EIS is identified.	
The concerns of Aboriginal groups will be presented in the EIS in accordance with Section 15 and Section 20 of these EIS Guidelines. BC Hydro will incorporate additional baseline information as made available based on concerns identified by Aboriginal groups.	
ACKNOWLEDGEMENTS	
This section of the EIS will acknowledge the regulatory agencies and authorities, Aboriginal groups, and key stakeholders that contributed to the development of the baseline study reports and the EIS.	
AUTHORSHIP	
This section of the EIS will provide a list of the project team members and their qualifications.	
TABLE OF CONCORDANCE	
A Table of Concordance will be provided in the EIS. The table will identify, through cross-referencing, where information identified in these EIS Guidelines that is required in the EIS can be found in the EIS, including volume, section and page references. An example of how the Table of Concordance will be constructed is illustrated in Table 1.	
Table 1 Table of concordance between the Environmental Impact Statement Guidelines and the Environmental Impact Statement	
EXECUTIVE SUMMARY	
The EIS will include an Executive Summary that summarizes:	
• the proponent, BC Hydro	

• the key project components and activities	
• the harmonized federal and provincial environmental assessment process	
• consultations undertaken by BC Hydro, key issues raised, responses provided and how input was considered in project planning	
• potential effects of the Project on environment, social, economic, heritage and human health resources	
• Aboriginal groups and the potential effects of the Project on their interests	
• mitigation measures	
• significance of potential residual effects	
• significance of potential cumulative effects	
• conclusions	
ABBREVIATIONS AND ACRONYMS	
A list of acronyms and abbreviations referred to in the text of the EIS will be provided and defined in this section.	
DEFINITIONS	
Definitions of technical terms referred to in the text of the EIS will be provided in this section. Many terms that will be relevant to the EIS have been previously defined in the Project Description Report accepted by the provincial and federal authorities in August 2011.	
A list of the terms used in this EIS Guidelines is included below.	
VOLUME 1 – INTRODUCTION, PROJECT PLANNING, AND DESCRIPTION	

1 PURPOSE OF THE ENVIRONMENTAL IMPACT STATEMENT	Request addition (within or before this Section 1): *The EIS must contain the clearest language possible. However, where the complexity of the issues addressed requires the use of technical language, a glossary defining technical words and acronyms must be included.* *In the interest of brevity, the EIS should make reference to, rather than repeat, information that has already been presented in other sections of the document. A key subject index would also be useful and should reference locations in the text by volume, section and sub-section. Supporting documentation can be provided in separate volumes, and referenced by volume, section and page in the text of the EIS. The proponent must submit the EIS and all supporting documents in hard copy and in an electronic format to facilitate internet access and for record keeping and review.* *The EIS shall provide charts, diagrams and maps wherever useful to clarify the text, including a depiction of what the developed Project sites would look like from an aerial perspective. Maps shall use a limited number of common scales to allow for comparison and overlay of mapped features. Maps shall indicate common and accepted local place names. The EIS shall present information, where technically feasible, using a standard Geographic Information System (GIS) mapping (digital) format with maps geo-referenced.*[25]

[25] Government of Canada and Government of Newfoundland and Labrador. July 2008.Environmental Impact Statement Guidelines: Lower Churchill Hydroelectric Generation Project Newfoundland and Labrador Hydro, at p.11.

This section of the Environment Impact Statement (EIS) will describe why an environmental assessment review pursuant to BCEAA and CEAA is required.	
The EIS will describe the provincial triggers for the environmental assessment. Pursuant to Part 4 of the *Reviewable Projects Regulation*, an environmental assessment is required because BC Hydro is proposing the following:	
• Construction of a new hydroelectric power generating station with a rated nameplate capacity of greater than 50 MW	
• A new 500kV transmission line greater or equal to 40 km in length	
• A new sand and gravel pit that will have a production capacity of greater than or equal to 500,000 tonnes per year, or over a period of less than or equal to a period of 4 years of operation greater than or equal to 1,000,000 tonnes, or a modification of an existing pit if it meets the criteria above or results in an expansion of 35 per cent of the existing permitted facility	
• A new construction stone quarry that will have a production capacity of greater than or equal to 250,000 tonnes per year, or a modification of an existing quarry of the above capacity or 750 hectares of land not previously permitted, or an area of land at least 50 per cent of the area previously permitted	
Pursuant to Section 5 of the CEAA and the *Law List Regulation*, a federal environmental assessment is to be conducted because:	
• Fisheries and Oceans Canada (DFO) has concluded that the Project requires *Fisheries Act*	

authorizations (Sections 20, 32 and 35) for works or undertakings associated with the Project	
• Transport Canada has concluded that it must issue an authorization under the *Navigable Waters Protection Act* (Section 5)	
• Natural Resources Canada has concluded that it must issue a licence for an explosives factory[26] under the *Explosives Act* (Section 7[1])	
The Project falls within Section 16(d) of the *Comprehensive Study List Regulations* because the Project would consist of:	
• A hydroelectric generating station with a production capacity greater than 200 MW	
• An electrical transmission line with a voltage greater than 345 kV and longer than 75 km	
• A new dam that would create a reservoir with a surface area that would exceed the annual mean surface area of the natural water body by 1,500 hectares or more	
• The construction of a stone quarry or gravel pit with a production capacity of 1,000,000 tonnes per annum or more; or the expansion of an existing	

[26] From the *Explosives Act* a "factory" means any building, structure, premises or land in or on which the manufacture or any part of the process of manufacture of an explosive is carried on, the site on which the building, structure or premises are situated, and all other buildings, structures or premises within such a site.

stone quarry or gravel pit that would result in an increase in production capacity of more than 35 per cent from 2011 production levels	
• The construction of a limestone quarry with a production capacity of 12,000 tonnes per day or more; or the expansion of an existing limestone quarry that would result in an increase in production capacity of more than 35 per cent from 2011 production levels	
This section of the EIS will also describe:	
• The purpose of the harmonized EIS	
• The relationship between these EIS Guidelines and the EIS	
In the interest of brevity, the harmonized EIS and Environmental Assessment Certificate Application (Application) are referred to collectively as the EIS. The joint terms of reference, called the EIS Guidelines-Application Information Requirements (AIR) are collectively referred to as these EIS Guidelines.	
The EIS will generally be structured in the same way as these EIS Guidelines and will include: Preface; Acknowledgements; Table of Concordance; Executive Summary; Abbreviations and Acronyms; Definitions; Table of Contents; Project Overview and Description; Needs for, Alternatives to, Purpose of, and Alternative Means of Undertaking the Project; Project Benefits; Public, Aboriginal Groups and Agency Information Distribution and Consultation; Assessment of Potential Environmental, Economic, Social, Heritage and Health Effects, Mitigation and Significance of Residual Effects; Assessment of Potential Aboriginal Interests and Information Requirements; Federal Information Requirements; Summary of Potential Residual Effects; Table of	Requested amendment: *…and Significance of Residual Effects; Assessment of ~~Potential~~ Asserted Aboriginal Rights, Treaty Rights and Interests and Information Requirements;*

Conditions; and Conclusions.	
A draft Table of Contents for the EIS is provided in Appendix A of these EIS Guidelines.	
2 PROPONENT DESCRIPTION	
The EIS will describe BC Hydro, and provide contact information for the project management team.	Requested addition: *The EIS shall:* • *provide contact information (e.g. name, address, phone, fax, email)* • *identify the name of the legal entity that would develop, manage and operate the project;* • *explain corporate and management structures, as well as insurance and liability management related to the project;* • *specify the mechanism used to ensure that corporate policies will be implemented and respected for the project;* • *summarize key elements of the proponent's environment, health and safety management system and discuss how the system will be integrated into the project; and* • *identify key personnel, contractors, and/or sub-contractors responsible for preparing the EIS.*[27]
BC Hydro is a Crown corporation that is owned by the	

[27] CEAA. 2011. Guidelines for the Preparation of an Environmental Impact Statement for the Comprehensive Study Process Pursuant to the *Canadian Environmental Assessment Act*, at p.8.

Province of British Columbia.	
3 PROJECT OVERVIEW	
In accordance with Section 15 of CEAA, the Minister of Environment of Canada has determined that the scope of the Project in relation to which an environmental assessment will be conducted of the Project as proposed by BC Hydro in the Project Description Report (BC Hydro 2011a) and as it may be modified from time to time. Descriptions of the Project and its components are set out in these EIS Guidelines for convenience only.	See General Comments – Cumulative Effects
The EIS will describe BC Hydro's project governance process for the Project. It will then describe the project location and project components and activities.	

3.1 Project Governance Process	
BC Hydro will describe the governance and multi-staged decision-making process for the Project.	This sub-section of the EIS is open to broad interpretation, and further clarification needs to be provided in the EIS Guidelines in relation to "the governance and multi-staged decision-making process for the Project", including: • *the main participants in the environmental assessment, including government ministries and departments, Aboriginal groups, municipal governments, and funded interveners;* • *all relationships between the Project and relevant legislation, regulations and policies (municipal, provincial, and federal); and* • *a summary of the regional, provincial and national objectives, standards or guidelines that the proponent has used in the environmental assessment.*[28]
3.1.1 Scheduling	
An estimated year-by-year construction and operations schedule based on project planning at the time of preparation of the EIS will be incorporated into the EIS.	Schedules at more appropriate temporal scales (monthly, seasonally or annually) are required in order to understand and assess the environmental effects of the proposed Project. Requested change:

[28] CEAA. 2011. Guidelines for the Preparation of an Environmental Impact Statement for the Comprehensive Study Process Pursuant to the *Canadian Environmental Assessment Act*, at p.9.

	An estimated ~~year-by-year~~ month-by-month construction and operations schedule based on project planning at the time of preparation of the EIS will be incorporated into the EIS.
3.2 Project Location	
The EIS will identify the proposed project location. The EIS will indicate that the Project lies within the tract of land described in Treaty 8. The EIS will provide mapping at appropriate scales indicating the location and regional setting of the project components. For example, figures will illustrate:	
• Overall site layout including the local and regional setting of the project components and activities	
• Location of nearby communities, including Aboriginal communities	
• Tenure, ownership and land management details for lands within the areas of project components	
As appropriate, site plans, photographs and other graphics will be used to describe project components and activities.	
The dam and hydroelectric generating station will be located on the Peace River in northeast B.C., approximately 7 km southwest of the City of Fort St. John (Figure 3.1).	
Figure 3.1 Site C project location	
3.3 Project Components and Activities	
The EIS will describe the project components and activities.	

The description of the project components and activities will be supported by:	
• Maps depicting the spatial scope and local context	
• Plan and cross-section drawings	
• Tables containing pertinent data	
The temporal context of the project component and activities will be described, and BC Hydro will provide a rationale in instances where all temporal phases are not considered relevant.	We request that this section of the EIS Guidelines acknowledge that certain components and activities related to the Project have already been constructed or put into place. Understanding these components and activities is necessary to a proper assessment of the direct and cumulative effects of the proposed Project on Section 35(1) rights. Requested amendment: *The temporal context of the project component and activities will be described, <u>including those components and activities initiated prior to the submission of the Project Description Report, which include but are not limited to the following:</u>* • *<u>the flood reserve on the Peace River between Hudson's Hope and Taylor first established in 1957; and</u>* • *<u>the transmission line right of way on the south side of the Peace River between the Peace Canyon Dam and the proposed Site C transformer station.</u>* *~~and~~ BC Hydro will provide a rationale in instances where all temporal phases are not considered relevant.*
The description of the construction activities will be based on construction planning and assumptions at the time the EIS is submitted. Some activities may be different during implementation depending on procurement, including contractors' preferences for equipment, construction means and methods, and competitive pricing. Therefore, feasible options for some activities may be described if required to define the likely range of potential effects of the construction activities.	

3.3.1 Dam and Generating Station	
3.3.1.1 Earthfill Dam	
The EIS will describe:	
• The principal dimensions of the earthfill dam and associated buttress	
• The characteristics and anticipated quantities of material used to construct each zone of the earthfill dam	
• The anticipated quantities of material used to construct the buttress	
• Seepage control and drainage provisions	
3.3.1.2 Generating Station	
The EIS will describe:	
• The principal dimensions of each structure that is part of the generating station, including the associated buttress	
• The approach channel that conveys water from the reservoir to the generating station and spillways	
• The type and anticipated quantities of materials used to construct each structure	
• Seepage control and drainage provisions	
• The principal characteristics of the generating equipment	
• The ancillary mechanical and electrical systems	
• The tailrace that conveys water from the powerhouse to the river downstream of the dam	

3.3.2 Spillways	
The EIS will describe:	
• The principal dimensions of each part of the spillway, including the associated buttress	
• The type and anticipated quantities of materials used to construct each structure	
• Seepage control and drainage provisions	
• The equipment used to operate the spillway	
• The hydraulic capacity of the spillway at the maximum normal reservoir level and the maximum flood level	
• The tailrace that conveys water from the spillways to the river downstream of the dam	
• The energy dissipation and erosion protection provisions	
3.3.3 Reservoir	
The EIS will describe the physical characteristics of the reservoir, including:	
• Its normal operating range	
• Its overlap with the Peace River and its spatial extent into Peace River's tributaries	
• The surface area at the maximum normal reservoir level, with the area of each tributary arm	
• The normal operating water volume, and the volume between the maximum normal reservoir level and the minimum normal reservoir level	

• Reservoir bathymetry	
3.3.4 Transmission Line to Peace Canyon	
The EIS will describe the facilities required to connect to the bulk transmission system, including access roads required for clearing, construction and maintenance of the transmission line.	Requested amendment: *The EIS will describe the facilities required to connect to the bulk transmission system, including transmission line(s), transmission system upgrades (e.g. series compensation), and access roads required for clearing, construction and maintenance of the transmission line.*
3.3.5 Access Roads and Rail	
The EIS will describe the permanent and temporary access routes required for access to the project site. The EIS will also describe any improvements that would be required to existing roads and rail. Maps showing the access roads and rail will be provided.	
3.3.6 Highway 29 Realignment	
The EIS will describe the proposed sections of Highway 29 that would be realigned. The description will include the approximate length of bridges and causeways at watercourse crossings, clearance between bridges and the reservoir and the factors considered in alignment selection. Mapping of the proposed highway alignments will accompany the descriptions.	
3.3.7 Quarried and Excavated Construction Materials	
The EIS will describe the sources of riprap, aggregates and till that would be required to construct the dam and generating station, for highway realignment, and for the berm at Hudson's Hope. Maps showing the location of the	

proposed sources will be included with the descriptions.	
3.3.8 Worker Accommodation	
The EIS will describe plans for temporary worker accommodation for construction, at the dam site and other locations, as well as any plans for provision of worker accommodations in nearby communities.	
3.3.9 Construction Phase Activities	
The EIS will describe the expected construction sequence and activities for each project component. A description of the information to be provided is listed below.	The Draft EIS Guidelines include transportation in relation to several activities (e.g. construction of the dam and generating station, reservoir preparation, etc.). In order to better assess the effects of this transportation for noise, safety, and use of lands and resources, among other potential effects, transportation information needs to be assembled and presented on a "whole of project" basis. Requested addition: *The EIS will describe the **transportation activities** related to the Project, including:* • *location and standards of all temporary access roads;* • *location and standards of all permanent access roads;* • *location and new standards of any widened or upgraded roads;* • *increased traffic volumes on existing, temporary and permanent access roads and upgraded roads on a monthly, seasonal and annual basis for the duration of the construction activities* In addition to assembling transportation information on a "whole of project" basis, land "taken up" as a result of construction of the Project must also be mapped and presented appropriately in order to assess effects on Section 35(1) rights. Requested addition: *The EIS will describe the **lands taken up by Project***

	components and activities *during the construction phase, including lands related to the following activities:* • *dam and generating station* • *reservoir preparation* • *transmission system* • *transportation infrastructure* • *quarried and excavated material sources*
The EIS will describe the following activities for construction of the **dam and generating station:**	
• Site clearing and grubbing	
• Construction of temporary and permanent access and haul routes	
• Modifications to rail	
• Construction of a temporary access bridge over the Peace River and one over the mouth of the Moberly River	
• Transportation of equipment and materials to the site	
• Set up and operation of the temporary facilities required for construction	
• Excavations to stabilize slopes and for the foundations of structures	
• Stockpiling of excavated materials for use in construction	
• Relocation of surplus excavated materials that are unsuitable for construction, including estimated quantities, locations and treatment of relocation areas	
• Construction of cofferdams to confine the river to the main channel and isolate the north and south banks	

of the river so that work can be performed in the dry	
• Construction of the diversion tunnels	
• Diversion of the river through the tunnels	
• Construction of cofferdams across the main river channel to isolate the foundations of the earthfill dam	
• Construction of the earthfill dam	
• Placing roller-compacted concrete in the buttress abutting the earthfill dam and supporting the generating station and spillways	
• Placing reinforced concrete for the generating station and spillways	
• Placing the impervious lining and erosion protection in the approach channel	
• Placing erosion protection in the tailrace and spillway outlet channel	
• Fabricating and erecting the steel penstocks of the generating station	
• Erection of buildings and powerhouse superstructure	
• Installation of mechanical and electrical equipment	
• Testing and commissioning the generating facility and spillways	
• Removal of temporary construction facilities, including roads and bridges	
• Disposal of construction waste	
• Site reclamation	
The EIS will describe the following construction activities for	

reservoir preparation, including:	
• Estimated volumes of merchantable and non-merchantable wood within the reservoir area	
• Proposed extent and locations of cleared areas	
• Clearing strategy and methods	
• Proposed access routes, including transportation of merchantable timber to processing facilities	
• Construction of temporary access roads	
• Construction of the shoreline protection berm at Hudson's Hope	
• Removal or treatment of existing structures or utilities	
• Reservoir filling	
• Methods for managing wood debris during construction and reservoir filling	
The EIS will describe the following construction activities for the connection to the **transmission system**:	
• Clearing to widen the existing right-of-way	
• Construction of new access roads and upgrading of existing roads	
• Construction laydown areas along the transmission corridor for the storage of materials and assembly of components	
• Installation of tower foundations	
• Batching of concrete for tower foundations;	
• Assembly and erection of towers and supporting structures	

• Stringing conductor wires	
• Installation of grounding systems (i.e., counterpoise)	
The EIS will describe the following construction activities for **access roads to the dam site**:	
• Construction of access roads on the north bank including connections to and, where required, upgrades of, existing municipal roads	
• Construction of an access road on the south bank connecting to the existing Jackfish Lake road and any upgrades required to the existing road	
• Traffic management during modifications to existing roads	
• Addition of new rail sidings and associated facilities on the existing Canadian National railway	
The EIS will describe the following construction activities for each section of **Highway 29** that has to be relocated or modified:	
• Clearing and grubbing	
• Removal/decommissioning of existing pavement	
• Excavation and embankment construction	
• Sources of gravel fill, sub-base, base course and asphalt	
• Pavement construction	
• Bridge construction	
• Construction of connections to existing driveways and local roads	
• Construction sequence	
• Traffic management	

The EIS will describe the following construction activities for each **quarried and excavated material source:**	
• Development plan	
• Clearing and grubbing	
• Construction of access roads	
• Excavation and stockpiling of unsuitable material, including topsoil	
• Excavation of suitable material, including drilling, blasting, sorting and screening in rock quarries and moisture conditioning of impervious material	
• Reclamation plan, or plan for ongoing use by others	
The EIS will describe how the **construction contracts** will include:	
• Commitments to perform all construction activities in accordance with the Project Environmental Management Plan	
• The process to be followed for upgrading any bridges required to meet load capacity	
3.3.10 Operations Phase Activities	
A description of activities to be conducted during the operations phase will be included in this section of the EIS.	Requested addition (as per the construction phase): *The EIS will describe the **transportation activities** related to the Project, including:* • *location and standards of all permanent access roads;* • *location and new standards of any widened or upgraded roads;* • *increased traffic volumes on existing and permanent access roads and upgraded roads on a monthly, seasonal and annual basis*

	In addition to assembling transportation information on a "whole of project" basis, land "taken up" during operations of the Project must also be mapped and presented appropriately in order to assess effects on Section 35(1) rights. Requested addition: *The EIS will describe the **lands taken up by Project components and activities** during its construction, within lands covered by Treaty 8, including lands related to the following activities:* • *dam and generating station* • *reservoir preparation* • *transmission system* • *transportation infrastructure* • *quarried and excavated material sources*
The Project will be operated to respond to provincial electricity demand in the same manner as BC Hydro's other generating facilities on the Peace River. A water management approach will be developed for the Project which will describe reservoir operations and resulting downstream flows and water levels. A draft of a Water Management Plan will be appended to the EIS. The final Water Management Plan will require approval by the BC Comptroller of Water Rights as part of the water licensing process.	In order to provide context for the environmental assessment, we request that this sub-section be changed to add the following sentence after the first sentence in the paragraph. *The EIS will describe the current operating conditions and other relevant aspects of the WAC Bennett Dam and Peace Canyon Dams as established in the Peace Project Water Use Plan.*
The EIS will include an estimate of the frequency and duration of potential spillway discharges.	Requested amendment: *The EIS will include an estimate of the frequency, seasonality, and duration of potential spillway discharges.*
The EIS will also include a list of operating plans where there would be a potential interaction with the Valued Components and provide outlines of each of those plans.	

3.3.11 Decommissioning Activities	
The EIS will describe the decommissioning of the temporary construction facilities.	
Once operational, the Project will be a major addition to BC Hydro's hydroelectric generating assets. Such assets are operated and maintained over the long term with no future decommissioning contemplated. Should a proposal be made in the future to decommission the Site C dam and generating station, a plan for decommissioning and restoration would be developed and executed by BC Hydro, in accordance with applicable regulations at that time.	The EIS Guidelines for the recently assessed Lower Churchill Hydroelectric Generation Project required the following with respect to decommissioning (s.4.3.6): *"[t]he EIS will present an approach for the decommissioning phase of the Project, which sets out a commitment to address: environmental planning and mitigation measures; socio-economic mitigation measures; and public health and safety procedure"*[29] The Joint Review Panel clarified this requirement in Information Request #JRP.150, as follows: *The Proponent is asked to provide an overview of the range of options that exist for decommissioning hydroelectric facilities, including information on environmental planning and mitigation measures, socio-economic mitigation measures, public health and safety procedures and costs (order of magnitude estimates).* *The Proponent is asked to discuss how dam decommissioning would change environmental conditions, whether the pre-Project river system and associated habitats*

[29] Government of Canada and Government of Newfoundland and Labrador. July 2008.Environmental Impact Statement Guidelines: Lower Churchill Hydroelectric Generation Project Newfoundland and Labrador Hydro, at p.23.

	could be re-established and how long this might take. The approach taken for the Lower Churchill Hydroelectric Generation Project is reasonable, prudent, and important to the assessment of the Project. Requested addition: *The EIS will provide an overview of the range of options that exist for decommissioning hydroelectric facilities, including information on environmental planning and mitigation measures, socio-economic mitigation measures, public health and safety procedures and estimated costs.* *The EIS will discuss how dam decommissioning would change environmental conditions, whether the pre-Project river system and associated habitats could be re-established and how long this might take. Appropriate maps and illustrations will be provided to illustrate the decommissioning options and environmental conditions.*
3.4 References	
This subsection will include a list of supporting references	

used in this section of the EIS.	
4 NEED FOR, ALTERNATIVES TO, PURPOSE OF, AND ALTERNATIVE MEANS OF CARRYING OUT, THE PROJECT	We request that the sequence of sub-sections in this section of the EIS Guidelines be ordered more logically and in accordance with Agency policy[30] as follows: • Purpose of the Project • Need for the Project • Alternatives to the Project • Alternative Means of Carrying out the Project
4.1 Need for the Project	
The EIS will describe the "need for" the Project. The "need for" the Project is defined as the problem or opportunity that the Project is intending to address, solve or satisfy (Agency 2007b). The "need for" establishes the fundamental justification or rationale for the Project.	
In the EIS, the need for the Project will be explained within the Provincial legal and policy context that result from the B.C. *Clean Energy Act* and *Utilities Commission Act*.	See General Comments – Need, Purpose and Alternatives to the Project
The need for the Project will be demonstrated using BC Hydro's most recent load-resource balance. Establishing the load-resource balance begins with defining customers' electricity needs through BC Hydro's most recent 20-year	

[30] CEAA. 2011. Guidelines for the Preparation of an Environmental Impact Statement for the Comprehensive Study Process Pursuant to the *Canadian Environmental Assessment Act*.

electric load forecast. Comparison of the load forecast to existing and committed resources indicates the volume and timing of resource requirements. This comparison will be performed for two reliability requirements – energy and dependable capacity.	
The EIS will present the need for the Project in terms of forecasted electricity demand and in economic terms:	
• How the Project fulfills the mandate of BC Hydro to provide cost-effective, reliable electricity to its service area	
• How the Project meets the objectives of the B.C. *Clean Energy Act* , the B.C. Government's "The BC Energy Plan: A Vision for Clean Energy Leadership" (BCMEMPR 2007), BC Hydro's vision, objectives, and values (BC Hydro 2011b)	See comments related to s.4.3 Project Purpose.
The EIS will provide a description of methodologies, assumptions and conclusions used in the analysis, and will include an evaluation of the following:	
• Current and forecasted electricity demand	Requested amendment: • *Current and forecasted electricity demand, including the source, location and expected evolution* The location and source of the demand are relevant to the consideration of alternatives to the Project. The location of the electricity demand is relevant to the transmission infrastructure required to meet that demand and therefore to the assessment of cumulative effects.
• Current and forecasted BC Hydro electricity conservation measures	Requested amendment: • *Current and forecasted BC Hydro electricity conservation, electricity efficiency and demand-side management measures, including embedded generation* Requested addition:

	• *Current and forecasted non-BC Hydro electricity conservation, electricity efficiency, and demand-side management measures, including embedded generation*
• Existing resources	
• Committed resources – those that have received British Columbia Utilities Commission, and if necessary BCEAO, and/or BC Hydro Board of Directors approvals, but are not yet in-service	
• The uncertainties in load growth and resource delivery	This list of uncertainties is too narrow to properly determine the need for the project. Requested additions: • *in-stream flow variability;* • *export market prices;* • *planning and construction schedule delays* • *interest rates; and* • *other risk factors relevant to the decision to proceed with the Project*
4.2 Alternatives to the Project	
The EIS will describe the functionally different ways to meet the need for the Project. The EIS will contain an analysis of technically and economically feasible alternatives to the Project that are within the control of BC Hydro – that is, those alternatives that are available to BC Hydro, including: (1) management of electricity demand through utility-based energy efficiency and conservation initiatives; (2) alternative generation sources to the Project; (3) the addition by BC Hydro of more dependable capacity at existing generation facilities; and (4) implications of non-implementation or postponement of the Project.	See comments related to s.4.3 Project Purpose.

4.2.1 Rationale for Selection of Resources for Consideration	
The EIS will identify the legislative and policy rationales for including and excluding certain resource alternatives from consideration, such as:	It is unclear whether this list is meant to be exhaustive or not. Requested additions (or potentially to the list in s.4.2.2): • *Part 1 of the Clean Energy Act establishes British Columbia's energy objectives, including to generate 93% of the electricity in British Columbia from clean or renewable resources* • *Part 1, section 2(1) of the Greenhouse Gas Reduction Targets Act establishes the Province's greenhouse gas emissions target levels*
• Policy Action No. 23 of the 2007 Energy Plan provides that nuclear power "is not part of B.C.'s energy future". BC Hydro is a Crown agent of the B.C. Government, and the B.C. Government can direct BC Hydro not to acquire nuclear power.	
• Sections 10 and 11 and Schedule 2, of the B.C. *Clean Energy Act* prohibit the following large hydroelectric projects: Murphy Creek, Border, High Site C, Low Site E, Elaho, McGregor Lower Canyon, Homathko River, Liard River, Iskut River, Cutoff Mountain and McGregor Diversion	
• Subsections 3(5), 6(2)(d) and 13 of the B.C. *Clean Energy Act*, and the Authorization for Burrard Thermal Electricity Regulation, restrict the role of Burrard Thermal Generating Station (Burrard) after the following projects are in service: Mica Units 5 and 6, the Interior to Lower Mainland Project, and the third transformer at the Meridian Substation. After this, BC Hydro will only be able to operate Burrard in case of "emergency" and for voltage support (not generating electricity but running in	

synchronous condenser mode).	
4.2.2 Evaluation of Alternatives to the Project	
The EIS will describe the methodology used to identify the major environmental, economic and technical costs and benefits of alternatives within the control of BC Hydro, and whether, and how, the Project can be seen as the preferred option based on consideration of the environmental, economic and technical benefits and costs.	Requested addition: *This analysis of alternatives will be done to a level of detail which is sufficient to allow the Agency, technical and regulatory agencies, the public and Aboriginal groups to compare the proposed project with its alternatives.*[31] *In the assessment of project alternatives, the EIS will take into account the relations and interactions among various components of the ecosystem, including affected Aboriginal and other communities, and any adverse impacts on potential or established Aboriginal and Treaty rights. Further, the EIS will demonstrate how the preferred alternative contributes to sustainable development.*[32] *The EIS will describe the conditions or circumstances that could affect or alter the selection of the preferred alternative, including:* • *Electricity market conditions (e.g. changes in demand, higher or lower levels of conservation);* • *economic conditions or factors (e.g. interest rates);*

[31] CEAA. 2011. Guidelines for the Preparation of an Environmental Impact Statement for the Comprehensive Study Process Pursuant to the *Canadian Environmental Assessment Act*, p. 13.

[32] CEAA. 2011. Guidelines for the Preparation of an Environmental Impact Statement for the Comprehensive Study Process Pursuant to the *Canadian Environmental Assessment Act*, p. 13.

	• *regulatory changes (e.g. greenhouse gases);* • *costs of supply-side alternatives;* • *Project-related costs; and* • *considerations respecting the timing of phases and components of the Project and alternatives to the Project. (i.e. whether the preferred alternative varies over time depending on when the Project is initiated.)* *The EIS will indicate how the principles outlined in the EIS Guidelines were taken into account in determining criteria for selecting the preferred alternative.*
The comparison of Site C to other options will be through an integrated resource planning methodology as follows:	
• Portfolio analysis - The methodology will evaluate alternative portfolios, each of which can meet BC Hydro's customers' electricity needs. These portfolios will be composed of discrete identified resources. Portfolio analysis is considered best practice for integrated resource planning analysis.	
• Scenario-based - The methodology will evaluate alternative portfolios under a range of potential future conditions.	
• Characterization of uncertainties and risks - The methodology should characterize the uncertainties and risks associated with the alternative portfolios under consideration.	
The EIS will also describe constraints that exist with respect to resources that could potentially be alternatives to the Project such as:	See comments above in s.4.2.1.
• Policy Action No. 20 of the 2007 Energy Plan stipulates that coal-fired generation must meet a zero greenhouse gas (GHG) emission standard "through a combination of clean coal fired	

generation technology, carbon sequestration and offsets for any residual GHG emissions". The EIS will provide information concerning the current status of coal-fired generation with carbon capture and sequestration.	
• Policy Action No. 18 of the 2007 Energy Plan requires that new natural gas-fired generation have zero net GHG emissions. Therefore, the analysis of natural gas-fired generation must include a discussion of GHG offset-related costs.	
4.3 Purpose of the Project	
The EIS will present the "purpose of" the Project. The "purpose of" the Project is defined as what is to be achieved by carrying out the Project (Agency 2007b). The "purpose of" the Project will be established from the perspective of BC Hydro, and will provide context for the consideration of alternatives means of carrying out the Project in Section 4.4.	The draft EIS Guidelines misstate Agency policy, which reads: *The 'purpose of' and 'need for' the project should be established from the perspective of the proponent and a context provided for the consideration of alternatives to the project.*[33] This difference is significant as the purpose described in the draft EIS Guidelines does not provide a proper context for consideration of alternatives to the Project.
The purpose of the Project is to maximize the development of the hydroelectric potential of the Peace River between BC Hydro's Peace Canyon generating station and the site	See General Comment – Need, Purpose and Alternatives to the Project

[33] CEAA. 2011. Guidelines for the Preparation of an Environmental Impact Statement for the Comprehensive Study Process Pursuant to the *Canadian Environmental Assessment Act*, at p.10.

of the proposed Site C dam and generating station in a cost effective manner.	
4.4 Alternative Means of Carrying Out the Project	
The EIS will summarize various studies on developing the hydroelectric potential of the Peace River downstream of Peace Canyon Dam that were undertaken prior to publication in 2007 of BC Hydro's report on the feasibility of the Project (the "Stage 1 Report").	See General Comments – Need, Purpose and Alternatives to the Project
The EIS will describe results of studies completed since the publication of the Stage 1 Report of the following alternative means of developing the hydroelectric potential of the Peace River between Peace Canyon Dam and Site C:	We note that for the analysis of alternative means to be meaningful it must include alternative means that do not maximize the development of the available head between Peace Canyon Dam and the location of the proposed Site C Project. Requested addition: *The EIS will describe technically feasible alternative means of developing some of the hydroelectric potential of the Peace River between Peace Canyon and Fort St. John.*
• A dam located 3 km upstream of Site C, upstream of the Moberly River confluence	
• A dam located 5.5 km upstream of Site C	
• A dam located 11.5 km upstream of Site C	
• A dam located at Site C, 15 m lower than that proposed in the Project, plus a 15-metre-high dam located 66 km upstream	
• A lower dam at Site C, with two other low dams located 22 km and 58.5 km upstream	
• A lower dam at Site C, with three other low dams	

located 18 km, 38.5 km and 60.5 km upstream	
• A very low dam located 0.5 km downstream of Site C, with six other very low dams located 10 km, 23 km, 36.5 km, 52.5 km, 65 km and 78.5 km upstream	
The EIS will describe the following characteristics of each of these alternatives:	
• Engineering parameters	
• The physical footprint during construction, reservoir filling and operation	
• The capital cost	
• Generation of dependable capacity	
The EIS will provide a parameter-based analysis comparing the relative potential environmental effects of the each of the alternative means identified above to the potential environmental effects of the Site C dam.	In addition to comparison of the relative potential environmental effects of each of the alternative means identified (and in addition alternative means that do not maximize the development of the available head), a comparison of the effects on Section 35(1) rights is also required. Requested addition: *When assessing project alternatives, the EIS will take into account the relations and interactions among various components of the ecosystem, including affected Aboriginal and other communities, and any adverse impacts on potential or established Aboriginal and Treaty rights.*[34]

[34] CEAA. 2011. Guidelines for the Preparation of an Environmental Impact Statement for the Comprehensive Study Process Pursuant to the *Canadian Environmental Assessment Act*, at p.13.

	The comparison of alternative means would also benefit from a thorough cost benefit analysis, which would acknowledge the environmental benefits (and effects on existing benefits) of the various alternative means.
The rationale by which BC Hydro identified the Project as the preferred alternative for developing the hydroelectric potential of the Peace River between Peace Canyon Dam and Site C will be described in the EIS.	Requested addition: • *The EIS will analyze and compare the alternatives means for the Project in relation to their environmental and social costs and benefits, including those alternative means that cost more to build and/or operate but that result in reduced adverse environmental effects or more durable social and economic benefits.* • *The EIS will indicate under what situations a change in circumstances or conditions may influence its selection of preferred alternative means.*
4.5 References	
This subsection will include a list of supporting references used in this section of the EIS.	
5 PROJECT BENEFITS	
The EIS will present the extent, distribution and duration of benefits of the Project and will describe the following information.	
Projected financial benefits of the Project, as measured by standard financial indicators, including:	
• The value of the electricity generated by the Project	Requested clarification: Does the Proponent intend to attach value to both electrical energy and capacity produced by the proposed Project?
• Initial capital construction cost and operating cost estimates	

• Annual federal, provincial, municipal, and regional government revenues that will accrue during the construction and operation phases of the Project	Requested amendment: *…revenues and net cash-flows that will accrue…*
• Annual federal and provincial Gross Domestic Product that will accrue during the construction and operations phases of the Project	
Projected economic development benefits, including:	Request that each of these benefits be broken down by gender.
• Estimated direct employment, stated in number of person years, to be created by major job category (e.g., labour, management, business services) during construction and operations	
• Estimated indirect employment (i.e., employment in industries that supply goods and services used to produce an industry's output or to be consumed by individuals) and induced employment (i.e., employment due to the spending and re-spending of directly and indirectly generated incomes in the broader economy) during construction and operation predicted by the British Columbia Input-Output Model developed and maintained by BC Stats (BC Stats 2011a)	
• Predicted locality of direct and indirect hires	
• Contractor supply services estimates, including the value of supply of service contracts expected for the Project's construction and operations phases	
Projected economic development benefits for Aboriginal groups, including:	Request that each of these benefits be broken down by gender.
• Employment	
• Contracting and business development	
• Capacity-building initiatives	

Projected social benefits, including:	Request that each of these benefits be broken down by gender.
• Potential for use of local human resources that are currently not in the labour market	
• Potential for use of existing local facilities for construction and operations activities, and an indication of their current level of use	
Provided benefits to sustainable development, including:	We support the inclusion of the potential of the Project to provide benefits to sustainable development. However, a meaningful sustainability assessment of the Project also requires consideration of the ability of the Project to result in impacts to sustainable development, which include the following: • *The ability of the Project to integrate intermittent generation sources such as wind and small hydro and the potential environmental effects of this additional development, effects on Section 35(1) rights, and implications for the taking up of lands within Treaty 8 territory* • *The potential for electricity from the Project to be used for the extraction, transportation, liquefaction, manufacturing, or combustion of fossil fuels resulting in increases in greenhouse gas emissions and other environmental effects* • *The potential for the Project to displace alternative sources of electricity supply or economically discourage electricity conservation that would have lower emissions of greenhouse gases or lower overall adverse environmental effects*
• The ability of the Project to integrate intermittent generation resources such as wind and small hydro	
• The ability of the Project to generate electricity with a low amount of greenhouse gas emissions per unit of energy delivered	

All assumptions and reference sources used to develop the above information will be identified.	
5.1 References	
This subsection will include a list of supporting references used in this section of the EIS.	

6 ASSESSMENT PROCESS	We request that the following new sub-sections be added to this Section 6 of the EIS Guidelines, at the most appropriate location: ***Aboriginal Agencies, Governments and Organizations*** *The EIS will identify policies and guidelines of the Aboriginal groups being consulted that are pertinent to the proposed Project and/or the environmental assessment and discuss their implications.* • *The EIS shall identify any publicly available agreements or arrangements, including Treaty No. 8, entered into between the Proponent and/or the Government of Canada and/or the Government of British Columbia and/or Aboriginal group(s) in the context of land claims or land rights, and address how they may affect or be affected by the Project.*[35] ***Previous Registration and Environmental Assessment***

[35] Government of Canada and Government of Newfoundland and Labrador. July 2008.Environmental Impact Statement Guidelines: Lower Churchill Hydroelectric Generation Project Newfoundland and Labrador Hydro, at p.14.

	The EIS shall describe their previous registrations of proposed hydro developments on the Peace River, environmental assessment(s), the outcome of the assessment(s), and the reasons the proposals presented in those previous registrations did not commence.[36] ***Other Registrations*** *The EIS shall indicate whether any other registrations are to be submitted for environmental assessment in the future as a result of this Project.*[37]
6.1 Provincial Agencies, Departments and Organizations	
The EIS will list the provincial agencies, departments and organizations that will be involved in the Project's environmental assessment process.	Requested addition: *The EIS will:* • *identify the environmental and other specific regulatory approvals and legislation that are applicable to the project at the provincial, regional and municipal levels;* • *identify provincial government policies, resource management, planning or study initiatives pertinent to the project and/or the environmental assessment and discuss*

[36] Government of Canada and Government of Newfoundland and Labrador. July 2008.Environmental Impact Statement Guidelines: Lower Churchill Hydroelectric Generation Project Newfoundland and Labrador Hydro, at p.14.

[37] Government of Canada and Government of Newfoundland and Labrador. July 2008.Environmental Impact Statement Guidelines: Lower Churchill Hydroelectric Generation Project Newfoundland and Labrador Hydro, at p.14.

	their implications; • *provide a description of any provincial or regional objectives, standards or guidelines that have been used in the EIS; and* • *identify any relevant land use plans, water use plans, land zoning, or community plans that have been used in the EIS.*
A summary of the issues and concerns identified by provincial, local and regional government agencies will be provided in the EIS. Detailed agency comments and BC Hydro responses will be provided in an issues tracking table to be prepared by BC Hydro and posted on the BCEAO's website.	
6.2 Federal Responsible Authorities and Federal Authorities	
The EIS will include a description of the Responsible Authorities and Federal Authorities.	Requested additions: *The EIS will:* • *identify the environmental and other specific regulatory approvals and legislation that are applicable to the project at the federal level;* • *identify federal government policies, resource management, planning or study initiatives pertinent to the project and/or the environmental assessment and discuss their implications;* • *provide a description of any federal objectives, standards or guidelines that have been used in the EIS.*
A summary of the issues and concerns identified by federal agencies will be provided in the EIS. Detailed agency comments and BC Hydro responses will be provided in an issues tracking table to be prepared by BC Hydro.	Request for this summary to be posted to the Agency's public registry.

6.3 Co-operative Review Process	
The EIS will describe the cooperative BC and Canada review process.	
The EIS will describe BC Hydro's preparation of the draft EIS Guidelines, its review by the BCEAO, the Agency and the Working Group, the public comment period, and its finalization by the Minister of Environment of Canada and the Executive Director of the BCEAO. The EIS will be prepared by BC Hydro according to these EIS Guidelines and will be submitted to the Agency, BCEAO and Working Group for review and comment.	
6.4 Permitting	
The EIS will list applicable federal, provincial, and municipal or regional licences, permits and approvals required for the construction and operation of the Project, and will identify the associated responsible regulatory agencies. A preliminary list of key licences, permits and approvals is provided in the Project Description Report accepted by the BCEAO and the Agency in August 2011.	Requested amendment: *The EIS will list applicable federal, provincial, and municipal or regional licences, permits and approvals required for the construction and operation of the Project, and will identify:* • *the activity requiring regulatory approval;* • *the name of the permit or regulatory approval;*

	• *the applicable legislation in each case; and* • *the associated responsible regulatory agencies responsible for each permit or approval*. [38]
6.5 References	
This subsection will include a list of supporting references used in this section of the EIS.	
7 INFORMATION DISTRIBUTION AND CONSULTATION	
The requirements for distribution of information to and consultation with the public, Aboriginal groups and agencies will be described in this section.	
7.1 Public Information Distribution and Consultation	
The EIS will describe and summarize BC Hydro's information distribution and consultation activities with local government, communities, stakeholders, property owners and the public prior to and during the environmental assessment process. This section will also describe expected public and stakeholder consultation during post-	

[38] Government of Canada and Government of Newfoundland and Labrador. July 2008.Environmental Impact Statement Guidelines: Lower Churchill Hydroelectric Generation Project Newfoundland and Labrador Hydro, at p.14.

certification stages.	
BC Hydro will report on the results of all public and stakeholder pre-consultation, project definition consultation and other consultation activities in the EIS.	
7.1.1 Pre-panel Review Stage	
The EIS will include a description and summary of BC Hydro's information distribution and consultation activities undertaken with the public and stakeholders.	
This section will include:	
• A description of the public consultation program	
• A summary of the issues and interests identified by the public during the course of the Project's information distribution and consultation activities during the pre-panel stage and the means that BC Hydro has used, or proposes to use, to consider them. Issues tracking tables will be provided	
• A summary of comments provided by the public with respect to these EIS Guidelines, and BC Hydro's responses to those comments. Issues will be summarized by BC Hydro in an issues tracking table, which will also describe how the issues will be considered, list the party or parties responsible for addressing issues, and list the status of issues	
• A summary of additional BC Hydro-led public consultation on project planning and completion of the environmental assessment	
The EIS will describe consultation undertaken to cover both the preparation of these EIS Guidelines and the EIS.	

7.1.2 Construction Communication	
The EIS will describe BC Hydro's approach to continuing communications with affected communities, stakeholders, property owners, leaseholders, businesses and the public in the project area during project construction. The EIS will outline a construction communication plan for the public.	
7.2 Aboriginal Group Information Distribution and Consultation	
The EIS will describe BC Hydro's general approach and detailed activities to consultation with Aboriginal groups prior to and during the environmental assessment process.	
The EIS will identify the Aboriginal groups potentially adversely affected by the Project as identified by the BCEAO and the Agency. Maps will be provided in the EIS showing the location of Aboriginal communities, and the area in which Treaty 8 First Nations exercise treaty rights.	
7.2.1 Pre-Panel Review Stage	
The EIS will present detailed information regarding the information distribution and consultation activities undertaken with Aboriginal groups.	
The EIS will also include:	
• A description of how project information has been made available to potentially affected Aboriginal groups	
• A summary of BC Hydro's approach to facilitating the participation of Aboriginal groups in the environmental assessment process	
• A description of the activities undertaken to notify	

and consult with potentially affected Aboriginal groups, during the preparation of both of these EIS Guidelines and the EIS	
• The issues, concerns and interests identified by Aboriginal groups. This will be presented in an issues tracking table, prepared by BC Hydro for posting on the BCEAO and Agency's websites	
• The activities undertaken by BC Hydro to address any issues, concerns and interests identified by Aboriginal groups, including the degree to which Aboriginal issues have been taken into account, resolved and addressed	
• The methods and processes to resolve any outstanding issues	
• Changes that are suggested during the draft EIS Guidelines review process that may be incorporated into these EIS Guidelines as appropriate	
BC Hydro will provide a description of consultations with Aboriginal groups to cover both the preparation of these EIS Guidelines and the EIS.	
7.2.2 Construction Communication	
The EIS will describe BC Hydro's approach to continuing communications and consultation with Aboriginal groups in the vicinity of the Project during project construction and issuances of permits and authorizations. The EIS will outline a construction communication plan for Aboriginal groups.	

7.3 Agency Information Distribution and Consultation	
The EIS will describe and summarize BC Hydro's information distribution and consultation activities undertaken with federal, provincial, territorial and local governments prior to and during the environmental assessment process. This section will also comment on what would be expected with respect to agency consultation during post-certification stages.	
7.3.1 Pre-Panel Review Stage	
The EIS will describe the consultation and information sharing with the agencies that occurred prior to entering the environmental assessment process and during the pre-panel review stage (development of these EIS Guidelines and EIS). This section will identify issues raised during these consultations, and describe BC Hydro's response or suggested solutions.	
In the EIS, BC Hydro will summarize issues raised prior to entering the environmental assessment process, primarily through BC Hydro's Technical Advisory Committees process.	
The EIS will summarize engagement with agencies that occurred with working groups, topic-specific engagement with appropriate agencies led by BC Hydro, and issues raised during these meetings.	
7.3.2 Construction Communication	
The EIS will describe BC Hydro's approach to engaging with federal and provincial regulatory agencies and local governments during project construction. The EIS will describe the methods to be used to document and report	

the status of project compliance with respect to requirements and conditions to the Agency, Responsibility Authorities, BCEAO and provincial ministries. The EIS will also describe a proposed process for tracking and reporting regulatory issues and concerns raised during project construction and operations.	
7.4 References	
This subsection will include a list of supporting references used in this section of the EIS.	
VOLUME 2 – ASSESSMENT METHODOLOGY AND ENVIRONMENTAL EFFECTS ASSESSMENT	
8 EFFECTS ASSESSMENT METHODOLOGY	
8.1 Overview	
In the EIS, BC Hydro will identify the potential adverse effects of the Project identified using the environmental assessment methodology outlined in Figure 8.1 and described in the sections below.	Requested addition: *In describing methods, the proponent will document how it used scientific, engineering, Aboriginal traditional and community knowledge to reach its conclusions. Assumptions must be clearly identified and justified. All data, models and studies should be documented such that the analyses are transparent and reproducible. All data collection methods should be specified. The uncertainty, reliability and sensitivity of models used to reach conclusions should be indicated.* *All significant gaps in knowledge and understanding related to key conclusions presented in the EIS will be identified. The steps to be taken by the proponent to address these gaps will also be identified. Where the conclusions drawn from scientific and technical knowledge are inconsistent with the*

	conclusions drawn from traditional knowledge, the EIS will contain a balanced presentation of the issues and a statement of the proponent's conclusions.[39]
Figure 8.1 Conceptual representation of the environmental assessment process	
8.2 Technical Studies and Planning	
To conduct an environmental assessment of the Project, planning and technical studies will be undertaken and reports will be prepared. The planning and technical studies will fall within these general categories:	
• Reports summarizing consultation with government agencies, Aboriginal groups, and the public	
• Baseline conditions	
• Predictive studies	
• Certain steps in project planning, for example, estimates of the direct employment required for construction of the Project will be derived	
• A framework for environmental management to be implemented during construction and operation of	

[39] CEAA. 2011. Guidelines for the Preparation of an Environmental Impact Statement for the Comprehensive Study Process Pursuant to the *Canadian Environmental Assessment Act*, at p.6.

the Project	
The EIS will describe the planning and technical studies undertaken to produce the information required for the EIS, and will include descriptions of, or attach, the results of the planning and the technical studies.	
8.3 Selection of Valued Components	
The EIS will describe the valued components (VC) identified in accordance with the process described below and shown in Figure 8.2.The term "valued component" also refers to the federal term "valued ecosystem components".	See General Comments – Valued Components The EIS Guidelines would benefit from further detail concerning the definition, purpose and limitations of valued components. Requested addition: *The EIS must explain and justify methods used to predict the effects of the project on each VC, which includes biophysical and socio-economic components, the interactions among these components and on the relations of these components within the environment. The information presented must be substantiated. The EIS will describe how the VCs were selected and what methods were used to predict and assess the adverse environmental effects of the project on these components.*[40] *Where appropriate and possible to do so, the Proponent will present a time series of data and sufficient information to establish the averages, trends and extremes of the data that*

[40] CEAA. 2011. Guidelines for the Preparation of an Environmental Impact Statement for the Comprehensive Study Process Pursuant to the *Canadian Environmental Assessment Act*, at p.12.

	are necessary for the evaluation of potential environmental and cumulative effects of the Project. For each VC, the EIS should consider and justify how far back in time and how far into the future the environmental assessment should be conducted. The Proponent will identify any deficiencies in information, and how these deficiencies will be addressed.[41]
8.3.1 Identification of Candidate Valued Components – Step 1	
The EIS will describe, as Step 1, the process for identification of candidate-valued components ("candidate VCs"). Candidate VCs will be selected based on interests and concerns raised by the public and Aboriginal groups prior to the issuance of these EIS Guidelines, and input obtained during consultation with the public, government agencies and Aboriginal groups leading up to submission of the EIS to the Agency and the BCEAO. In doing so, BC Hydro will seek to identify those components that are valued:	It is unclear whether the VCs for the baseline, effects assessment and the cumulative effects assessment will be the same or different. As an example, the key indicators proposed in 10.2.3 for the fish and fish habitat baseline are different than the key indicators proposed in s.10.2.4 for the effects assessment. Requested addition (or in sub-section 8.5.3): *The EIS will indicate whether valued components used for the Project effects assessment will be the same as for the cumulative effects assessment, and will provide justification and rationale for using the same or different VCs for the cumulative effects assessment.*

[41] Government of Canada and Government of Newfoundland and Labrador. July 2008.Environmental Impact Statement Guidelines: Lower Churchill Hydroelectric Generation Project Newfoundland and Labrador Hydro, at p.25.

	Requested addition: *In considering VCs, the Proponent will recognize that:* • *The value of a component not only relates to its role in the ecosystem, but also to the value placed on it by humans;* • *Culture and way of life of those using the area affected by the Project may also be considered as VCs; and* • *Functional relationships within the environment may also be considered as VCs.*[42]
• For environmental, economic, social, heritage or human health reasons	Requested additions to this list: • *For their economic significance;* • *Due to their protected status;* • *Due to regulatory requirements;* • *For their rarity or special status;* • *For the preservation of biodiversity;* • *Due to their sensitivity to disturbances or pollution;* • *Human health;* • *Due to the importance of their ecological role; or* • *Due to their cultural heritage or social significance.* [43]

[42] Government of Canada and Government of Newfoundland and Labrador. July 2008.Environmental Impact Statement Guidelines: Lower Churchill Hydroelectric Generation Project Newfoundland and Labrador Hydro, at p.24.

[43] Government of Canada and Government of Newfoundland and Labrador. July 2008.Environmental Impact Statement Guidelines: Lower Churchill Hydroelectric Generation Project Newfoundland and Labrador Hydro, at p.23.

• As land or resources currently used by Aboriginal persons for traditional purposes	Requested amendment: • *As land or resources for previous, currently or future used by Aboriginal persons for traditional purposes*
Figure 8.2. Decision process for the selection of valued components	
8.3.2 Project Interaction Identification – Step 2	
The EIS will describe how the candidate VCs will be evaluated to identify whether there is an interaction, a cause-and-effect pathway, linking the candidate VC to the Project in Step 2. Linkage diagrams in the format shown in Appendix B demonstrate the cause-and-effect pathways that will be provided in the EIS.	See General Comments – Valued Components
The approach for determining potential project interactions involved the following steps:	
• Identify project components and activities	
• Map project activity zones temporally and spatially	
• Locate the candidate VC temporally and spatially	
• Identify potential interactions between the candidate VC and project components or activities	
In the EIS, the interactions between the project components and each of the candidate VCs will be identified, ranked and presented in the format shown in Table 8.1.	
Potential interactions will be ranked as follows:	
• A rank of “0” will be given where no interaction is predicted between a project component and a candidate VC	

• A rank of “1” will be given where an adverse effect may result from an interaction, but standard measures to avoid or minimize the potential effect are available and well understood to be effective, and any residual effects are negligible	
For example:	
○ Water-borne sediment resulting from soil erosion has a potential interaction with fish and fish habitat, which can be effectively mitigated by applying Fisheries and Oceans Canada’s and the BC Ministry of Environment’s “Land Development Guidelines for the Protection of Aquatic Habitat” and the B.C. Ministry of Environment’s “Standards and Best Practices for Instream Works”	
○ Oil spilled in or near a body of water has a potential interaction with fish and fish habitat, which can be effectively mitigated by applying the B.C. Ministry of Environment’s “Standards and Best Practices for Instream Works” and the B.C. Ministry of Environment’s “Field Guide to Fuel Handling, Transportation and Storage”	
• A rank of “2” will be given where interactions may result in an adverse effect and mitigation measures are not well understood.	
Candidate VCs subject to an interaction ranked “2” will be carried forward into Step 3 of the VC selection process.	

Table 8.1 Example of an interactions matrix used to screen project interactions	
8.3.3 Selection of Valued Components – Step 3	
Step 3 is a determination as to whether the effect of an interaction on each candidate VC carried through to this point in the selection process can be effectively assessed under a separate and related, but more appropriate, candidate VC.	
A key consideration in determining whether a more appropriate candidate VC exists is whether, given the nature of the candidate VC, it falls within the same effects pathway as another candidate VC. An example of an effects pathway is: the burning of project-related woody debris, which may in turn lead to deterioration in "air quality", which may in turn ultimately contribute to an adverse effect on human health. In this example, parameters of "air quality" will be identified, measured and reported. This data will be used to assess the potential impact of the Project on the human health VC.	Requested addition: *The EIS will state the rationale for the selection or rejection of each candidate VC. Where candidate VCs are excluded, sufficient documentation of the information and criteria used to make the determination will be documented to justify the exclusion should its exclusion be challenged. Examples of justification include primary data collection, computer modelling, literature references, public consultation, expert input and professional judgment. If comments are received on a component that has not been included as a VC, these comments will be summarised and addressed.*[44]
The candidate VCs that are not rejected in Steps 1, 2 and 3, and that cannot be effectively assessed under another VC will be taken forward through the effects assessment.	

[44] CEAA. 2011. Guidelines for the Preparation of an Environmental Impact Statement for the Comprehensive Study Process Pursuant to the *Canadian Environmental Assessment Act*, at p.17.

Not all candidate VCs will be carried forward through the effects assessment. However, technical data collected for these candidate VCs will be taken into account in the assessment of potential effects on the VCs that are carried through.	Clarification is required that the finalization of the EIS Guidelines will not result in finalization of the VCs. Requested addition: *It is understood that the process for defining VCs is iterative and that the list of VCs can be modified during the environmental effects analysis phase. The VCs can be revised and adjusted in relation to the information acquired during the environmental assessment process.*[45]
8.4 Assessment Boundaries	
8.4.1 Spatial Boundaries	
The EIS will describe the spatial boundaries within which each of the potential adverse effects of the Project will be assessed. The spatial boundaries will be presented as described in the spatial boundary tables in the VC specific effects assessment sections in these EIS Guidelines. Spatial boundaries will also describe the relevant administrative and technical boundaries, where applicable.	Requested amendment: *The EIS will describe the spatial boundaries within which each of the potential adverse effects of the Project will be assessed. ~~The spatial boundaries will be presented as described in the spatial boundary tables in the VC specific effects assessment sections in these EIS Guidelines.~~ The EIS will present the rationale for the spatial boundaries to be used to assess potential adverse effects of the Project relevant to each VC. Spatial boundaries will also describe the relevant administrative and technical boundaries, where applicable*

[45] Government of Canada and Government of Newfoundland and Labrador. July 2008.Environmental Impact Statement Guidelines: Lower Churchill Hydroelectric Generation Project Newfoundland and Labrador Hydro, at p.32.

	Requested addition: *The EIS must contain a justification and rationale for all boundaries chosen. It is important to note that the spatial boundaries for each VEC may not be the same.*[46] *Each study area should be inclusive of the landscape necessary to predict the environmental effects of the Project on each VC.*[47] *Study boundaries must be defined taking into account (where applicable) the spatial extent of potential environmental effects, traditional and local knowledge, past, current and proposed land use by Aboriginal groups, ecological, technical, political and social and cultural considerations.*[48]
These spatial boundaries will be defined based on applicable discipline guidance documents (e.g., BCMOE 2008, BCOGC 2009). Spatial boundaries descriptors are listed in Table 8.2.	Requested addition: *The geographic study areas for the EIS must encompass the areas of the environment that can reasonably be expected to be affected by the Project, or which may be relevant to the assessment of cumulative environmental effects. In determining the spatial boundaries to be used in assessing the potential adverse and beneficial environmental effects, the EIS must consider, but not be limited to, the following criteria:*

[46] CEAA. 2011. Guidelines for the Preparation of an Environmental Impact Statement for the Comprehensive Study Process Pursuant to the *Canadian Environmental Assessment Act*, at p.12.

[47] Government of Canada and Government of Newfoundland and Labrador. July 2008.Environmental Impact Statement Guidelines: Lower Churchill Hydroelectric Generation Project Newfoundland and Labrador Hydro, at p.24.

[48] CEAA. 2011. Guidelines for the Preparation of an Environmental Impact Statement for the Comprehensive Study Process Pursuant to the *Canadian Environmental Assessment Act*, at p.12.

	• *the physical extent of the proposed project, including any offsite facilities or activities;* • *the extent of aquatic and terrestrial ecosystems potentially affected by the project;* • *the extent of potential effects arising from noise, light and atmospheric emissions;* • *the extent to which traditional land use, asserted or established Aboriginal rights, Aboriginal title or Treaty rights could potentially be affected by the project;* • *lands used for residential, commercial, industrial, recreational, cultural, and aesthetic purposes by communities whose areas include the physical extent of the project; and* • *the size, nature and location of past, present and reasonably foreseeable projects and activities which could interact with items b), c), d) and e).*[49]

[49] CEAA and NEB. 2009. Guidelines for the Preparation of the Environmental Impact Statement for Ontario Power Generation's Darlington New Nuclear Power Plant Project, at p.26.

Table 8.2 Spatial boundary descriptors	Requested clarification: Why does the Project Activity Zone exclude the "transportation infrastructure that will be used without modification to transport materials or personnel required for the Project"? Transportation activity on existing roads would have adverse effects in several ways, including noise effects, roadkill, effects on land use, etc.
8.4.2 Temporal Boundaries	
The EIS will present the rationale for the temporal boundaries to be used to assess potential adverse effects of the Project relevant to each VC.	Requested addition: *The EIS will provide a concise discussion of past hydroelectric generation projects on the Peace River and its tributaries, the environmental effects that have occurred as a result, where overlapping environmental effects are anticipated, and the measures that have been taken to mitigate or manage these overlapping environmental effects. Discussion of overlapping environmental effects should include consideration of the degree to which those mitigation measures have been successful. Any long-term monitoring or follow-up programs of relevance to these overlapping environmental effects and the key results should also be described.*[50] *In describing and predicting the environmental effects of the*

[50] Government of Canada and Government of Newfoundland and Labrador. July 2008.Environmental Impact Statement Guidelines: Lower Churchill Hydroelectric Generation Project Newfoundland and Labrador Hydro, at p.24-25

	Project, the Proponent must cover the period from the start of any site preparation activity associated with the project through construction, operation, including maintenance and repairs, and refurbishment, where applicable, and eventual decommissioning and abandonment.[51] *Site preparation activity would include:* • *the flood reserve established in 1957 in the Peace River valley between Hudson's Hope and Taylor that is essential to the Project; and* • *the transmission right of way on the south side of the Peace River through the Peace-Moberly tract established prior to 1980*
8.5 Effects Assessment Methods	
The EIS will describe the methods used to assess potential adverse effects on VCs as described below.	
8.5.1 Baseline Conditions	
In the EIS, baseline conditions will be described, as follows:	
▪ identify relevant legal framework (e.g., *Fisheries Act*)	

[51] CEAA and NEB. 2009. Guidelines for the Preparation of the Environmental Impact Statement for Ontario Power Generation's Darlington New Nuclear Power Plant Project, at p.27.

▪ explain the methods used to collect the baseline data	
▪ identify sources of information	
▪ explain the extent to which information has been obtained from the public and has been considered	
▪ explain the extent to which Aboriginal traditional knowledge has been obtained and has been considered	
▪ provide an overall baseline description	
8.5.2 Analysis of Effects	
For each VC carried through the effects assessment, the EIS will identify, describe and present an analysis of each of the potential adverse effects resulting from the Project.	
In the EIS, for each VC, the information outlined in Sections 10 to 19 of these EIS Guidelines will be presented.	
8.5.2.1 Description of Potential Adverse Effects on Valued Components	
For each VC carried through the assessment process, potential adverse effects on the VCs will be described, including:	Assessing "valued components" and "key indicators" is an accepted practice in environmental assessment in Canada to use limited resources more efficiently. However, it is also important to recognize what the "indicator species" might be indicating. For example, if 60% of primary wetland sparrow habitat is lost, it is not just the wetland sparrows that are affected but everything else in those habitat types that we did not study because it was too complicated and time consuming. This reality needs to be discussed in the EIS. Requested addition: *Emphasis must be on those species, communities and processes identified as VCs. However, the interrelations of*

	these components and their relation to the entire ecosystem and communities of which they are a part must be indicated.[52]
▪ cause-and-effect pathway, the mechanism by which the Project may result in each potential adverse effect	
▪ quantitative and qualitative parameters by which each potential adverse effect will be characterized	
8.5.2.2 Identification of Mitigation Measures	
The EIS will describe the technically and economically feasible measures that BC Hydro is proposing to mitigate any potentially significant adverse effects of the Project.	Requested replacement of this sub-section with the following: *The EIS shall identify and discuss the proposed mitigation measures that are technically and economically feasible and that would mitigate the significant adverse effects of the Project and enhance beneficial effects, including the interaction of these measures with existing environmental management plans.* *Under the CEAA, mitigation is defined as the elimination, reduction or control of the adverse environmental effects of the Project, and includes restitution for any damage to the environment caused by such effects through replacement, restoration, compensation or any other means. The rationale for and effectiveness of the proposed mitigation and enhancement measures should be discussed and evaluated.*

[52] CEAA. 2011. Guidelines for the Preparation of an Environmental Impact Statement for the Comprehensive Study Process Pursuant to the *Canadian Environmental Assessment Act*, at p.17

	The EIS, where possible, should refer to similar situations where the proposed mitigation has proven to be successful. Mitigation failure should be discussed with respect to risk and severity of consequence. The discussion should include failure of dam/control structures. *The EIS shall identify who is responsible for the implementation of these measures and the system of accountability, including the obligations of contractors and subcontractors.*[53]
8.5.2.3 Characterizing Residual Effects	
Residual adverse effects are the effects of the Project that may remain after taking into account the implementation of mitigation measures. The criteria listed in Table 8.3 will be used to characterize any beneficial effects and any residual adverse effects that may result from the Project.	
Where possible, these criteria will be described quantitatively for each VC. When residual effects cannot be characterized quantitatively, they will be characterized qualitatively. Definitions will be provided when qualitative terms are used. For each VC, the characterization criteria provided in Table 8.3 will be defined in specific terms in the EIS.	

[53] Government of Canada and Government of Newfoundland and Labrador. July 2008.Environmental Impact Statement Guidelines: Lower Churchill Hydroelectric Generation Project Newfoundland and Labrador Hydro, at p.36-37.

Table 8.3 Residual effects characterization	
8.5.2.4 Significance of Residual Effects	
In the EIS, BC Hydro will provide its assessment of the significance of any residual adverse effects and its rationale for that determination. The determination will incorporate the federal and provincial guidance (e.g., Agency 1999, FEARO 1994). The EIS will contain a summary of residual effects in a table format as shown below (Table 8.4).	Requested addition: *Residual effects are those adverse environmental effects which cannot or will not be avoided or mitigated through the application of environmental control technologies, best management practices or other acceptable means.*
Table 8.4 Summary of assessment of potential significant residual adverse effects	
8.5.3 Cumulative Effects Assessment	
The EIS will provide an assessment of the cumulative effects that are likely to result from the Project in combination with other projects or activities that have been or will be carried out. Federal and provincial guidance will be consulted (e.g., Agency 2007c, BCEAO 2010, Hegmann et al. 1999).	
A cumulative effects assessment of the Project on a VC will be conducted if the potential residual adverse effect of the Project on that VC has a spatial and temporal overlap with	Requested addition: *Cumulative effects are defined as changes to the environment due to the Project where those overlap, combine or interact*

a residual effect of another project.	*with the environmental effects of other past, existing or reasonably foreseeable projects or activities.*[54]
The EIS will describe the cumulative effects assessment methodology, which will follow the method outlined above for the project-specific VC effects assessment, and will include the following steps:	Requested amendment: *The EIS will describe and justify the cumulative effects…* The above comments in s.8.3, s.8.4 and s.8.5 related to the project-specific VC effects assessment apply also to the cumulative effects assessment.
• Determination of spatial and temporal boundaries	Requested amendment: • *Determination and justification of spatial and temporal boundaries*
• Consideration of other projects and activities and identification of project interactions	Requested amendment: • *Consideration of other past projects and activities, those being carried out and future projects or activities likely to be carried out and identification of project interactions*[55]
• Description of cumulative effects	
• Identification of mitigation measures	
• Characterization of cumulative residual effects	
• Determination of significance of cumulative residual effects	

[54] Government of Canada and Government of Newfoundland and Labrador. July 2008.Environmental Impact Statement Guidelines: Lower Churchill Hydroelectric Generation Project Newfoundland and Labrador Hydro, at p.35.

[55] Government of Canada and Government of Newfoundland and Labrador. July 2008.Environmental Impact Statement Guidelines: Lower Churchill Hydroelectric Generation Project Newfoundland and Labrador Hydro, at p.35.

8.5.3.1 Spatial and Temporal Boundaries	
Cumulative effects will be assessed within an RAA defined for each VC. The spatial boundaries of the RAA will be based on:	Requested addition: *The cumulative effects assessment should provide a justification and description of the temporal boundaries and include, but not be limited to, the following:* • *a pre-industrial case that takes into account the effects that may have already been experienced prior to the project; and* • *future foreseeable projects or activities as of the issuance of the Joint Review Panel's Terms of Reference.*[56] *At a minimum, the assessment must include the period of time during which the maximum effect is predicted to occur. "Maximum" refers to the greatest change from baseline conditions to what is predicted from all Project components. The approach taken to determine the temporal boundary of the assessment should take into account the following elements:* • *duration of the construction and operational period;* • *design life of constructed components;* • *duration of both active and passive institutional controls; and* • *frequency and duration of natural events and human-*

[56] Agreement to Establish a Joint Review Panel for the Jackpine Mine Expansion Project between the Minister of Environment, Canada and the Energy Resources Conservation Board, Alberta, p.13.

	induced environmental changes (e.g., seismic occurrence, flood, drought, climate change, etc.).[57]
• where possible interactions with other projects or activities overlap	Requested amendment: • *where possible interactions with <u>other past, existing and future</u> projects or activities overlap"*
• for ecological boundaries, they will be ecologically defensible (e.g., wildlife range boundaries)	Requested amendment: • *for the purposes of assessing effects on Section 35(1) rights, they will consider traditional and local knowledge, past, current and proposed land use by Aboriginal groups, social and cultural considerations.*
To assess the cumulative effects that are likely to result from the Project in combination with other projects or activities that have been or will be carried out, BC Hydro will present the following in the EIS:	
Baseline Case: The Baseline Case will demonstrate the current status of the VC. In doing so, it will reflect the effect of all projects and activities that have been carried out.	See General Comments – Cumulative Effects
Future Case without the Project: To identify the potential adverse effects of projects and activities that will be carried out, the Future Case without the Project will be developed	

[57] CEAA and NEB. 2009. Guidelines for the Preparation of the Environmental Impact Statement for Ontario Power Generation's Darlington New Nuclear Power Plant Project, at p.27.

to predict the status of the VC by taking into account the Baseline Case and projects and activities that are at least as foreseeable as the Project. This will demonstrate the potential residual effects of projects and activities that have been and will be carried out.	
Project Case: To demonstrate the cumulative effects that are likely to result from the Project, the Project Case will demonstrate the status of the VC, taking into account the residual effects of the Project that are likely combined with those identified in the Future Case Without the Project.	
8.5.3.2 The Project Inclusion List	
The following types of projects and activities within the RAA will be taken into account in the Future Case Without the Project and in the Project Case:	See General Comments – Cumulative Effects Requested addition to the Project Inclusion list: • *activities relied upon by BC Hydro to demonstrate the need for the Project*
• Registered as active projects on BCEAO website	
• Registered as active projects on CEA Agency website	
• Registered water licence applications	
• Registered oil and gas applications	
• Forest Stewardship Plans	
• Official Community Plans	
The EIS will provide an assessment of the adequacy of existing data in conducting the cumulative effects assessment.	We understand that this sub-section would require BC Hydro to conduct an assessment of the adequacy of existing data as part of its cumulative effects assessment. Since the availability and quality of existing data will vary among Valued Components it will be necessary to assess and document the relative quality of this data so the reliability of inferences can be established.

	We recommend that this sub-section be clarified to reflect this.
The project-interaction methodology used to determine project interactions for the project-specific effects assessment (shown in Section 8.3.2) will be used to identify interactions with other projects and activities.	See comments above concerning s.8.3.2.
The EIS will provide maps that show the projects and activities that overlap with the Project for each residual effect.	
8.5.3.3 Analysis of Cumulative Effects	
Description of Potential Cumulative Effects on VCs	
The EIS will describe the potential cumulative effects on VCs, including the following:	
• Overview of the project or activity	
• Project status	Requested replacement: • *Status of the project or activity*
• Spatial and temporal boundary	
• Potential residual cumulative effects	
Identification of Cumulative Effects Mitigation Measures	
If significant residual cumulative effects are identified, the EIS will recommend possible regional approaches to mitigation.	Based on correspondence with BC Hydro, we understand this sub-section to mean that "if residual cumulative effects are identified, BC Hydro would look at mitigation options. However, because the potential effects would be on a cumulative scale, recommendations regarding possible regional approaches would be made because the implementation of potential mitigation measures could be out of BC Hydro's control." We recommend that this sub-section be clarified to reflect this.
Characterizing Residual Cumulative Effect	

The EIS will characterize the residual cumulative effects using the approach outlined for the Project-specific effects assessment described in Section 8.5.2 and the criteria provided in Table 8.3.	
Significance of Residual Cumulative Effects	
In the EIS, BC Hydro will provide its assessment of the significance of any residual adverse cumulative effect that may result from the Project, and the rationale for its assessment.	
8.6 References	
This subsection will include a list of supporting references used in this section of the EIS.	
9 ENVIRONMENTAL BACKGROUND	
As further described below, the EIS will describe:	Requested addition: *The EIS will provide a baseline description of the existing environment, including its components and processes, interrelations and interactions as well as the variability in these components, processes and interactions over time scales appropriate to the EIS. The description will be in sufficient detail to permit the identification, assessment and determination of the significance of potentially adverse environmental effects that may be caused by the project, to*

	adequately identify and characterize the beneficial effects of the project, and to provide the data necessary to enable effective testing of predictions during any follow-up program.[58] *The baseline description should include results from studies done prior to any physical disruption of the environment due to initial site preparation activities and characterization of environmental conditions resulting from historical and present activities in the local and regional study area.*[59] *Components of the environment must be described and shall include the necessary data and the required information to understand, interpret and address the confidence levels of these data (e.g., methods; survey dates and times; weather conditions; location of sampling stations) and shall employ appropriate methods to identify, understand, analyze and assess the environmental effects of the Project.* *In addition, the EIS shall describe environmental interrelationships and sensitivity to disturbance. If the study results or data have been extrapolated or otherwise manipulated to depict environmental conditions in the study area modeling methods and equations shall be described with calculations of margins of error and/or confidence limits.* [60]

[58] CEAA. 2011. Guidelines for the Preparation of an Environmental Impact Statement for the Comprehensive Study Process Pursuant to the *Canadian Environmental Assessment Act*, at p.15.

[59] CEAA. 2011. Guidelines for the Preparation of an Environmental Impact Statement for the Comprehensive Study Process Pursuant to the *Canadian Environmental Assessment Act*, at p.16.

[60] Government of Canada and Government of Newfoundland and Labrador. July 2008.Environmental Impact Statement Guidelines: Lower Churchill Hydroelectric Generation Project Newfoundland and Labrador Hydro, at p.25.

• The state of land, water and air in the vicinity of the project	
• Certain changes to land, water and air based on predictive analyses	
9.1 Land	
9.1.1 Geology, Terrain and Soils	
The EIS will describe the physiographic and topographic setting and the stability of the terrain within the project activity zone.	
The EIS will contain a description of bedrock and surficial geology, key landforms (such as mountains, uplands, slopes, terraces and streams), existing and predicted changes to seismic conditions, and geotechnical and geochemical processes (such as erosion, slope stability and acid rock drainage) that may affect land or resource use. This will include:	
• regional bedrock and surficial geology, terrain stability and soil conditions	
• regional seismicity and seismic hazard	Requested addition: • *Relevant geologic structures (lineaments, faults, joints)*[61]

[61] Government of Canada and Government of Newfoundland and Labrador. July 2008.Environmental Impact Statement Guidelines: Lower Churchill Hydroelectric Generation Project Newfoundland and Labrador Hydro, at p.27.

• pertinent physical and chemical properties of soils and bedrock and potential for contaminants based on current and historic land uses	
Characterization and classification of the proposed reservoir shoreline will be carried out, including:	
• description of the geology at select representative cross-sections and extrapolation along the shoreline using borehole and surface mapping observations to produce geological fence diagrams	
• descriptions of geological materials and/or thickness of colluvium and a description of the underlying geological materials located at the normal maximum reservoir level	
• inventory of landslides, including their estimated mechanism, volume and current degree of activity	
• predictions of potential for groundwater changes caused by reservoir operations that could alter the potential for landslides	Requested amendment: • *predictions of potential for groundwater changes, <u>including changes in aquifer recharge rates or zones</u>, that could alter the potential for landslides*[62]
• classification of the erosion potential of the shoreline materials	Requested amendment: • *classification of the erosion potential of the shoreline materials, <u>and potential ground instability such as</u>*

[62] Government of Canada and Government of Newfoundland and Labrador. July 2008.Environmental Impact Statement Guidelines: Lower Churchill Hydroelectric Generation Project Newfoundland and Labrador Hydro, at p.27.

	slumping or landslide[63]
• estimation of short and long-term beach profiles (physical changes associated with erosion due to wind generated waves) for reservoir operation periods up to 100 years	
Predicted changes to shoreline erosion and slope stability due to the Project will be assessed based on the results of shoreline classification. A series of reservoir impact lines will be prepared to delineate areas where limitations on residential land use or other measures may be required to manage public safety.	
Sources of information regarding geology and terrain stability conditions within the technical study area will include:	
• Historical aerial photographs, ortho-photographs and satellite imagery	
• Published topographic maps	
• Published studies, maps and academic research on regional bedrock and surficial geology and engineering geology	
• Topography and digital elevation models generated	

[63] Government of Canada and Government of Newfoundland and Labrador. July 2008.Environmental Impact Statement Guidelines: Lower Churchill Hydroelectric Generation Project Newfoundland and Labrador Hydro, at p.27.

from aerial photography and from LiDAR	
• Published studies and academic research on landslides within the region, a detailed landslide inventory within the proposed reservoir area, and relevant landslide case histories	
• Historical and recent geotechnical investigations (mapping, drilling, test pits, material classification, testing, instrumentation monitoring and other techniques)	
• A regional and site-specific seismic hazard assessment	
9.1.2 Land Requirements	
The EIS will identify any requirements to acquire or obtain new rights over private or government-owned property to construct and operate the Project. The EIS will describe the approach for acquiring private property and rights to Crown land.	
9.2 Water	
9.2.1 Surface Water Regime	
The EIS will describe existing surface water hydrology conditions in the Peace River from Peace Canyon Dam downstream to the town of Peace Point, Alberta.	This sub-section will not provide sufficient information to assess the cumulative effects of the Project on Section 35(1) rights. Requested amendment: *The EIS will describe existing surface water hydrology conditions in the Peace River from ~~Peace Canyon Dam downstream to the town of Peace Point, Alberta~~ WAC Bennett Dam to the Peace-Athabasca Delta. The EIS will describe the current operating conditions of the WAC Bennett Dam and Peace Canyon Dams as established in the Peace Project Water Use Plan, and the effects of these operating conditions*

	on surface water hydrology conditions downstream to the Peace-Athabasca Delta.
The EIS will describe existing surface hydrological features (reservoirs, rivers, tributaries), watershed boundaries, mean annual flows, and flood zones for the Peace River down to Peace Point, Alberta, and the main drainage tributaries to the proposed reservoir (Lynx Creek, Farrell Creek, Halfway River, Moberly River).	The scope of the information indicated in this sub-section will not be sufficient to understand the environmental effects of the proposed Project. Requested amendment: *The EIS will describe for the Peace River and the main tributaries of the Peace River within the reservoir (e.g. Lynx Creek, Farrell Creek, Halfway River, Moberly River):* • *existing surface hydrological features (reservoirs, rivers, tributaries),* • *watershed boundaries,* • *river hydraulics,* • *bathymetry,* • *mean and extreme monthly, seasonal and annual flows, and* • *flood zones.* It is widely acknowledged[64] that a (if not *the*) primary adverse biophysical effect of river regulation is the reduction of species richness and the decline in the populations of many other species in river valleys as a result of the selective removal of particular types of riparian ecosystems due to both inundation and flow regulation (i.e. reduction or removal of the spring flood). Spring flooding is a key

[64] Naiman, R.J., H. Décamps and M. Pollock. 1993. The role of riparian corridors in maintaining regional biodiversity. *Ecological Applications* 3: 209-212; Millennium Ecosystem Assessment. 2005. *Millennium ecosystem assessment synthesis report*. World Resources Institute, Washington D.C.

	indicator of ecological health in a river system and can also be evaluated in a cumulative fashion throughout the watershed. Regulating a river largely removes a fundamental process, flooding cycles, which is what largely forms the structure and habitat complexity of the river channel and shores. If the proposed Project proceeds, the riverine system will become further simplified over an extensive area from what it is now. Requested addition: *The EIS will present existing knowledge concerning the importance of spring floods for river sedimentation, aquatic and shoreline vegetation, habitat complexity, biodiversity, nutrient supply, water quality and productivity.*
The EIS will describe in detail the hydraulic models that will be used to predict the potential changes in the hydrological regime as a result of the Project. A list of some of the models that will be used is provided in Table 9.1.	As proposed, the modeling would be done on the basis of the current operating conditions of the WAC Bennett Dam and Peace Canyon Dams. In order to undertake an appropriate cumulative environmental effects assessment and to identify possible regional approaches to mitigation, alternative operating conditions must be considered. Requested addition: *Hydraulic models used to predict the potential changes in the hydrological regime as a result of the Project will consider additional baseline operating conditions at the WAC Bennett and Peace Canyon Dams.*
The EIS will describe the following information for each model used:	Requested addition: • *limitations to the model*
• input parameters and assumptions	
• outputs provided by the model	
• basis of the model methodology	
• purpose for the model	
Models, as well as additional quantitative and qualitative assessment methods as required, will be used to describe:	
• the proposed reservoir (volume, bathymetry,	

maximum and minimum surface areas, active storage volume, and residence time)	
• anticipated changes in the hydraulic regime during construction (e.g., channelization, diversion, reservoir filling, and commissioning), including predicted ranges of water levels with inundation mapping for the construction headpond during channelization and diversion phases	
• seasonal flow patterns of post-construction flows, water levels, wetted widths, and average cross-sectional velocity statistics at selected locations on the Peace River downstream of the proposed dam to Peace Point, Alberta	Requested amendment: • *…at selected locations on the Peace River downstream of the proposed dam to ~~Peace Point, Alberta~~ the Peace-Athabasca Delta*
• expected frequency and range of water levels for the project reservoir	
Table 9.1 Hydraulic models used to predict potential changes in surface water hydrology	
A representative flow record will be used to assess hydrological conditions during construction and operation phases.	
9.2.2 Water Quality	
The EIS will describe existing water quality conditions in the Peace River and its tributaries from Williston Reservoir to the British Columbia/Alberta border. Water quality parameters recorded during baseline studies (e.g., nutrient and metals concentrations, suspended sediment levels, dissolved gas pressure levels, pH, alkalinity, temperature) will be summarized and compared with provincial and federal guidelines, including:	A water quality spatial boundary ending at the British Columbia/Alberta border has no ecological basis. Requested amendment: *The EIS will describe existing water quality conditions in the Peace River and its tributaries from Williston Reservoir to the ~~British Columbia/Alberta border~~ Peace-Athabasca Delta.*
• British Columbia Approved Water Quality Guidelines for freshwater aquatic life, drinking water	

supply, wildlife water supply, recreation and aesthetics, irrigation, and livestock water supply, as applicable (BCMOE 2010a)	
• Canadian Water Quality Guidelines for the protection of freshwater aquatic life and agricultural water uses, and recreational water quality and aesthetics (CCME 2011a)	
The EIS will include a description of sediment quality in the Peace River. Sediment data from the proposed reservoir will be summarized and compared with provincial and federal guidelines (CCME 2011b).	
9.2.3 Groundwater Regime	
The EIS will contain a description of the following existing conditions and potential changes to the groundwater regime from Peace Canyon Dam to the proposed Site C dam site, and along select roads on the south bank of the Peace River, as follows:	
• location of water wells, infrastructure, contamination, and land use that could be affected by changes to the groundwater regime	Requested addition: • *location of water wells, springs, infrastructure…*
• development of a series of two-dimensional cross-sections at representative reservoir locations where reservoir filling could affect slope stability, land or resource use	
• in the cross-sections, subsurface geology, aquifers and water table positions will be estimated for the baseline and reservoir conditions. Estimates will be based on a literature review, surface mapping, historic and recent geotechnical drilling, water well data, instrumentation monitoring results installed for the project, aquifer tests (specifically single well rising and falling head tests), lab testing and two-	

dimensional numerical groundwater flow results	
• qualitative extrapolation of the results of the two-dimensional cross-sections to lands nearby and adjacent to the reservoir using shoreline classification, geological fence diagrams and other available relevant hydrogeological information along the reservoir	
• the potential adverse effects of project construction and operations on groundwater quality will be evaluated qualitatively by assessing the potential changes to groundwater chemistry due to the release of substances related to non-natural sources (known or potential contamination) or natural sources (geologic materials)	
9.2.4 Thermal and Ice Regime	
The EIS will include a description of the existing water temperature and ice regimes of the Peace River. Technical study areas for reservoir and river locations are described below. This section of the EIS will support a description of the anticipated predictive changes in these parameters related to the Project.	
Reservoir	
The water temperature and ice regimes of the proposed reservoir will be predicted using H3D, a three-dimensional numerical model (Stronach et al. 1993). The technical study area for thermal and ice regimes in the reservoir will extend from the tailrace of the Peace Canyon Dam to the proposed Site C dam. The study period will extend from 1995 to 2011, the period for which the data set is available for analysis. These years will be used to simulate post-construction conditions. A description of the model, calibration and validation methods and predicted water	As proposed, the modeling would be done on the basis of the current operating conditions of the WAC Bennett Dam and Peace Canyon Dams. In order to undertake an appropriate cumulative environmental effects assessment and to identify possible regional approaches to mitigation, alternative operating conditions must be considered. Requested addition: *Ice models used to predict water temperature and ice regimes will consider additional baseline operating conditions at the WAC Bennett and Peace Canyon Dams.*

temperature and ice characteristics of the proposed reservoir will be provided.	
Downstream Temperature	
Potential changes to downstream water temperature from the Peace Canyon dam to Grimshaw, Alberta during open-water conditions will be studied using a two-dimensional cross-sectionally averaged hydrodynamic and water quality model (CE-QUAL W2). This model is being used primarily for the purpose of examining aquatic productivity. The CE-QUAL W2 models basic eutrophication processes such as temperature-nutrient-algae-dissolved oxygen-organic matter and sediment relationships (Portland State University, 2011).	Requested amendment: *Potential changes to downstream water temperature from the Peace Canyon dam to ~~Grimshaw, Alberta~~ the Peace-Athabasca Delta during open-water conditions will be studied…*
Downstream Ice	
Existing and post-construction ice conditions in the Peace River will be studied using the Comprehensive River Ice System Simulation Program model (CRISSP), a one-dimensional numerical ice simulation model. The technical study area for downstream ice conditions will extend from the proposed Site C dam to a location approximately 700 km downstream near Fort Vermilion, Alberta. The CRISSP model simulates ice processes in natural rivers, including water temperature variation, young ice, anchor ice evolution, surface ice run, ice cover formation, surface and undercover ice transport and jam, thermal growth and decay of ice, and breakup (Clarkson University, 2005).	Requested amendment: • *… The technical study area for downstream ice conditions will extend from the proposed Site C dam to a ~~location approximately 700 km downstream near Fort Vermilion, Alberta~~ the Peace-Athabasca Delta.*
The CRISSP model will be run using a representative range of atmospheric conditions. Results will be compared to determine the potential change on the following characteristics as a result of the Project:	
• timing of ice cover formation and breakup	
• maximum upstream extent of ice cover	

• ice thickness	
• river transportation	
9.2.5 Fluvial Geomorphology and Sediment Transport	
The EIS will present information regarding the existing conditions and predicted project-related changes to fluvial geomorphology and sediment transport in the Peace River between the Peace Canyon Dam and Peace Point, Alberta. The reservoir technical study area extends from the Peace Canyon Dam to the proposed Site C Dam location. The downstream technical study area extends from Site C to Peace Point, Alberta.	Requested amendment: • *The EIS will present information regarding the existing conditions and predicted project-related changes to fluvial geomorphology and sediment transport in the Peace River between the Peace Canyon Dam and ~~Peace Point, Alberta~~ the Peace-Athabasca Delta. The reservoir technical study area extends from the Peace Canyon Dam to the proposed Site C Dam location. The downstream technical study area extends from Site C to ~~Peace Point, Alberta~~ the Peace-Athabasca Delta.*
The fluvial geomorphology and sediment transport investigations will characterize baseline conditions of the following parameters:	Requested clarification: What is the intention of "as determined from existing information" in the following sub-sections? Our concern is that existing information may not be adequate to understand the extent of Project-related effects, and that fieldwork is required.
• Suspended sediment characteristics and transport rates in the Peace River and tributaries in the reservoir technical study area and in the downstream technical study area within the anticipated extent of Project-related effects as determined from existing information	
• Bed material characteristics and bedload transport rates in the Peace River and tributaries in the reservoir technical study area and in the downstream technical study area within the anticipated extent of Project-related effects as	Requested addition: • *Bed material characteristics, channel dynamics. and bedload transport rates*

determined from existing information	
• Historical locations, patterns, and rates of channel erosion and deposition in the downstream technical study area	
The sources of information reviewed will include:	
• Channel mapping from remote sensing imagery (aerial photographs and satellite imagery)	
• Water Survey of Canada streamflow and suspended sediment records	
• Project streamflow, turbidity and suspended sediment records	
• Project bed material sampling and bedload transport calculations	
The EIS will also present the results of predictive modelling used to characterize the potential changes in fluvial geomorphology and sediment transport and will consider the following:	As proposed, the modeling would be done on the basis of the current operating conditions of the WAC Bennett Dam and Peace Canyon Dams. In order to undertake an appropriate cumulative environmental effects assessment and to identify possible regional approaches to mitigation, alternative operating conditions must be considered. Requested addition: *Predictive models used to characterize the potential changes in fluvial geomorphology and sediment transport will consider additional baseline operating conditions at the WAC Bennett and Peace Canyon Dams.*
• Suspended sediment dynamics (inflow, deposition and outflow) in the proposed reservoir	
• Suspended sediment concentrations and tributary sediment mixing in the Peace River downstream of the proposed reservoir within the anticipated extent of Project-related effects as determined from existing information	
• Bed material mobilization in the proposed Site C	

tailrace area	
• Channel erosion and deposition downstream of proposed Site C dam site within the anticipated extent of Project-related effects as determined from existing information	
The EIS will describe the approaches used for predictive analyses of these parameters.	
9.2.6 Methylmercury	
The EIS will describe the approach used to determine the dynamics of mercury in the environment and an understanding of the conversion of inorganic mercury to methylmercury following reservoir creation from the Peace Canyon Dam to the proposed Site C dam.	
Existing conditions and an understanding of the methylation process will be conducted by:	
• Reviewing historic information within the Peace River system	
• Collecting mercury and methylmercury baseline data in the technical study area	Requested clarification: What constitutes "methylmercury baseline data"? Potential baseline information could include mercury in water, fish and fish-eating wildlife, riparian ecosystems, and/or soils.
• Reviewing other hydroelectric developments elsewhere in Canada that may pertain to mercury	
The EIS will summarize aquatic and terrestrial baseline information on mercury in environmental media within the technical study area, and will predict mercury concentrations within and downstream of the Site C reservoir to Many Islands, Alberta (200 km downstream of the W.A.C. Bennett Dam).	Requested amendment: • *…and downstream of the Site C reservoir to ~~Many Islands, Alberta (200 km downstream of the W.A.C. Bennett Dam)~~ the Peace-Athabasca Delta.* We recognize that water mercury concentrations may be below thresholds of concern downstream of the Smoky River; however, fish within the system are capable of migrating great distances. Since "fish

	and fish habitat" is the proposed VC, there is no basis to having different study areas for different aspects of fish habitat.
The EIS will also describe the methods used to develop a mechanistic model (RESMERC) for the purpose of predicting mercury and methylmercury concentrations in water and biota (e.g., invertebrates, fish) over the life of the Site C reservoir. This section of the EIS will summarize modelling results that will predict the rates of mercury methylation and de-methylation, as well as transfer and bioaccumulation of mercury through the food chain.	
9.3 Air	
9.3.1 Micro-Climate	
The EIS will present information regarding the existing conditions and predicted project-related changes to the microclimate in the Peace River valley and at the Fort St. John airport.	
The most current 30-year climate normals and hourly meteorological observations, both from Fort St John Airport, will be used to characterize baseline climate conditions. For parameters not provided in standard climate normal format (e.g., absolute humidity), the hourly data for the 30-year period will be summarized in a format consistent with the climate normals provided by Environment Canada. This will include the following parameters:	
• Temperature: Annual average, extreme minimum and maximum, daily average, minimum and maximum by month	
• Precipitation - Annual and monthly total precipitation	
• Wind speed - Monthly and annual average, monthly	

extreme maximum	
• Relative and absolute humidity - Monthly and annual average humidity	
• Fog - Monthly and annual hours of potential fog	
The climate monitoring network in the Peace River valley between Hudson's Hope and Taylor installed by BC Hydro will be used to improve the understanding of micro-climate parameters, including precipitation levels, wind speed and direction, air temperature, barometric pressure, humidity, solar radiation, and heat flux.	Requested clarification: How long has this climate monitoring network been in place?
The Weather Research and Forecast model will be used to assess and evaluate potential changes in microclimate due to the proposed reservoir. The Weather Research and Forecast Model is a mesoscale numerical weather prediction system designed to serve both operational forecasting and atmospheric research needs. It is suitable for a broad spectrum of applications across scales ranging from metres to thousands of kilometres. It allows practitioners the opportunity to conduct simulations reflecting either real data or idealized configurations.	As proposed, the modeling would be done on the basis of the current operating conditions of the WAC Bennett Dam and Peace Canyon Dams. In order to undertake an appropriate cumulative environmental effects assessment and in order to identify possible regional approaches to mitigation, alternative operating conditions must be considered. Requested additions: *The Weather Research and Forecast model used to assess and evaluate potential changes in microclimate due to the proposed reservoir will consider additional baseline operating conditions at the WAC Bennett and Peace Canyon Dams.*
The EIS will describe the model, its input and outputs. Inputs to the model that will be described in the EIS include: meteorological data and geophysical inputs that define land use category and terrain.	
9.3.2 Air Quality	
The EIS will present information regarding the existing conditions and predicted project-related changes to air quality in the Peace River valley associated with project activity zones.	
This section of the EIS will describe current ambient levels	We recommend that BC Hydro review ambient data from the BC

of the following:	Ministry of Environment prior to finalizing the list of parameters to be described in the EIS. Requested amendment: *This section of the EIS will describe current ambient levels ~~of~~, <u>including</u> the following:…*
• Nitrogen Oxides (NO_x)	
• Sulphur Dioxide (SO_2)	
• Carbon Monoxide (CO)	
• Particulate Matter less than 10 microns (PM_{10})	
• Particulate Matter less than 2.5 microns ($PM_{2.5}$)	
Baseline air quality conditions will be determined from ambient air quality data and emission inventories. Ambient air quality monitors were installed for the Project to collect baseline particulate matter (PM_{10} and $PM_{2.5}$) data. Background ambient air quality data for other contaminants will be obtained from the BC Ministry of Environment (BCMOE). The BCMOE operates a network of ambient air quality monitoring stations in the province. The closest ambient air quality monitoring stations to the potential Site C reservoir that would be included in the baseline study are located at the Fort St. John North Peace Cultural Centre, Taylor Townsite, and Taylor South Hill. Information on existing emissions in the technical study area will also be obtained from BCMOE's 2000 provincial emission inventory and from the National Pollutant Release Inventory.	
This section of the EIS will describe the estimated air quality emissions during construction activities. The emission estimation methodology will primarily adhere to the US Environmental Protection Agency's Compilation of Air Pollutant Emission Factors guidelines (US EPA 1995). The scope of the emission inventory will consider vehicles and equipment, clearing and burning of vegetation and	

debris, extraction of construction materials from quarries, gravel pits and borrow pits, material handling and processing, and fugitive emissions from access roads.	
9.3.3 Noise and Vibration	
The EIS will present information regarding the existing conditions and predicted project-related changes to noise and vibration within the project activity zone.	
The EIS will summarize baseline noise conditions determined from noise monitoring at identified receptor sites and through transportation studies.	
Noise receptors will be identified in the vicinity of anticipated construction and operation activities and along equipment movement corridors that are used by people and wildlife. The criteria available from the BC Oil and Gas Commission guidance document (BCOGC 2009) and the Ministry of Transportation and Infrastructure will be considered for the purposes of identifying noise effects.	
Noise levels will be modelled for selected scenarios during construction and operations using the CadnaA noise modelling prediction software (ISO 9613). The CadnaA modelling will include, where applicable, the topographic, temperature and wind effects on noise propagation of transportation- and equipment-generated sound emissions. The modelling will be conducted on the basis of sound power levels emitted by equipment that are established using previous measurements, published literature or manufacturer data.	Requested addition: *The modeling will include appropriate mapping showing predicted noise levels at standard distances from project infrastructure over time.* This mapping would be valuable in identifying those areas that would be affected during construction, and assist in predicting effects on terrestrial wildlife and Section 35(1) rights.
The EIS will describe the evaluation of blasting vibration and "sound-induced" or airborne vibration.	
Airborne vibration will be estimated using Canadian and international standards for calculation of vibration, including guidance from the Ontario Ministry of Environment NPC	

119 and the US Office of Surface Mining and Reclamation.	
9.4 Electric and Magnetic Fields	
The EIS will describe the existing electric and magnetic fields associated with the existing 138 kV transmission lines, and will identify and evaluate the potential changes from operational activities on these parameters.	
The EIS will summarize baseline conditions based on measurements of electric and magnetic field levels associated with the existing sources. It will describe the modelling approach and results used to predict electric and magnetic fields associated with existing sources and potential changes associated with the Project.	
9.5 References	
This subsection will include a list of supporting references used in this section of the EIS.	
10 FISH AND FISH HABITAT EFFECTS ASSESSMENT	
The EIS will summarize the effects assessment on the aquatic environment based on the methodology described in Section 8, including characterization of the benefits of the Project.	
Technical data will inform the fish and fish habitat effects assessment. The interests of Aboriginal groups will be presented in the EIS in accordance with Section 15 and Section 20 of these EIS Guidelines. Where Aboriginal groups have identified interests in a VC, BC Hydro will incorporate additional baseline information as made available.	See General Comments – Aboriginal Traditional Knowledge; Aboriginal Rights and Interests

10.1 Valued Component Scoping and Rationale	
The fish and fish habitat VC rationale for selection is described in Table 10.1. Fish and fish habitat has the potential to interact with the Project and there is a legal requirement to address potential effects on fish and fish habitat under the *Fisheries Act*.	
Table 10.1 Fish and fish habitat valued component rationale	See General Comments – Valued Components.
10.2 Fish and Fish Habitat	
10.2.1 Fish and Fish Habitat Spatial Boundaries	
The LAA and RAA are described in Table 10.2.	
Table 10.2 Fish and fish habitat assessment areas	See General Comments – Spatial Boundaries. Requested amendment: *Peace River from Peace Canyon Dam, BC to ~~Vermilion Chutes, AB, which is a distance of approximately 865 km~~<u>the Peace-Athabasca Delta</u>*
10.2.2 Fish and Fish Habitat Temporal Boundaries	
The EIS will describe the temporal boundaries which will reflect the methodology described in Section 8 of these EIS Guidelines.	
10.2.3 Fish and Fish Habitat Baseline	
The fish and fish habitat baseline data will provide an understanding of the existing fish community, distribution, movement and life history parameters of species	Requested amendment: *In describing the physical and biological environment, the proponent should take an ecosystem approach that considers*

populations, fish habitat characteristics, biological assemblages, water quality, and production of aquatic invertebrates that support fish populations in the Peace River and its tributaries. Aquatic conditions in the proposed reservoir and downstream of the dam site will be assessed using a predictive modelling approach. Data will be collected for the following key indicators:	*both scientific and Aboriginal traditional knowledge perspectives regarding ecosystem health and integrity. The proponent must identify and justify the indicators and measures of ecosystem health, social health and integrity used for analysis and relate these to the project's monitoring and follow-up measures.*[65] Requested amendment: *The fish and fish habitat baseline data will provide an understanding of the existing fish community, distribution, movement, health, sources of disease and mortality, population density and life history parameters of species populations, fish habitat characteristics, biological assemblages, water quality, nutrient and chemical cycling, foodwebs, and production of aquatic invertebrates that support fish populations in the Peace River and its tributaries. Habitat at regional and local scales will be defined in ecological mapping of aquatic and terrestrial vegetation types and species (e.g., terrestrial ecosystem mapping). Aquatic conditions in the proposed reservoir and downstream of the dam site will be assessed using a predictive modelling approach. Data will be collected for the following key indicators:*
• Fish species, community, abundance, distribution,	Requested amendment:

[65] CEAA. 2011. Guidelines for the Preparation of an Environmental Impact Statement for the Comprehensive Study Process Pursuant to the *Canadian Environmental Assessment Act*, at p.16.

movement and life history	• *Fish species, community, interrelationships, resilience, natural variation, abundance, distribution, movement, range, and life history*
• Fish habitat use, quality and quantity	Requested amendment: • *Fish habitat utilization~~use~~,including frequency, seasonality, duration and purpose (e.g spawning, rearing, nursery, etc.), quality, variability, and quantity*
• Changes in environmental factors in their environment (e.g., food, water temperature)	
The EIS will identify sensitive fish species or species of provincial or federal conservation concern, including any species listed in the federal *Species at Risk Act* (SARA), and endangered fish species listed in the BCMOE's Endangered Species and Ecosystems, Provincial Red and Blue Lists (BCMOE 2010b).	Requested amendment: • *The EIS will identify any fish species of conservation or ceremonial concern to Aboriginal groups.*
Information used to describe baseline conditions and predictive analyses will consist of:	Requested addition: • *Aboriginal traditional and local knowledge studies*
• Peace River and tributaries fish and fish habitat inventories	
• Peace River radio telemetry studies	
• Peace River water quality studies	
• Peace River baseline aquatic productivity studies	
• Site C aquatic productivity modelling, consisting of:	
○ Multivariate statistical approaches to estimate changes in primary and secondary production based on field data and habitat variables	
○ Predictive computer modelling using the CE-QUAL W2 software package originally developed by the US Corps of Engineers for	

simulating conditions in reservoirs and associated influent and effluent streams to simulate physical and chemical conditions, and primary production	
○ ECOPATH (Christensen and Walters 2004), a steady state model that provides a biological mass balance of an ecosystem	
○ Peace River mercury studies and modelling	
10.2.4 Potential Effects of the Project and Proposed Mitigation	
The EIS will assess how the Project has the potential to adversely affect fish populations.	It is unclear why "fish populations" have been singled out in this sub-section of the EIS Guidelines. Requested amendment: *The EIS will assess how the Project has the potential to adversely affect fish habitat quantity, fish habitat quality, fish populations, and fish health.*
The potential to adversely affect fish and fish habitat will be assessed by taking into account the potential for the Project to result in changes to the following key aspects of Fish and Fish Habitat: changes in nutrients; and abundance or composition of the lower trophic components of the food web.	Requested amendment: *The potential to adversely affect fish and fish habitat will be assessed by taking into account the potential for the Project to result in changes to ~~the following~~ key aspects of Fish and Fish Habitat, including:* • *changes in nutrients; ~~and~~* • *changes in abundance or composition of the lower trophic components of the food web;* • *changes in contaminant concentrations and/or mobility* • *changes in habitat quantity;* • *changes in habitat quality;* • *changes in species composition, distribution and abundance;* • *changes in fish mortality; and*

	• *changes in fish health.*
Should potential adverse effects be identified, the potential mitigation and benefit enhancement measures will be identified and will include a description of how the mitigation measures can address the potential adverse effect.	See comments re: s.8.5.2.2.
The EIS will describe project residual effects, and cumulative effects, if applicable, using the residual effects characterization described in Table 8.3. A statement of significance will be provided.	
10.2.5 Summary of Residual Effects on Fish and Fish Habitat	
The EIS will summarize residual effects in a table format as shown in Table 8.4.	
10.3 References	
This subsection will include a list of supporting references used in this section of the EIS.	
11 VEGETATION AND PLANT COMMUNITIES EFFECTS ASSESSMENT	
The EIS will summarize the vegetation and plant communities effects based on the methodology described in Section 8.	
Technical data will inform the vegetation and plant communities effects assessment. The interests of Aboriginal groups will be presented in the EIS in accordance with Section 15 and Section 20 of these EIS Guidelines. Where Aboriginal groups have identified interests in a VC, BC Hydro will incorporate additional	See General Comments – Aboriginal Traditional Knowledge; Aboriginal Rights and Interests

baseline information as made available.	
11.1 Valued Component Scoping and Rationale	
The vegetation and plant communities VC rationale for selection is described in 11.1. Where available, supporting information that shows the importance of the VC is included as part of the rationale for selection, as are regulatory requirements.	
Table 11.1 Vegetation and plant communities valued component rationale	See General Comments – Valued Components.
11.2 Vegetation and Plant Communities	
11.2.1 Vegetation and Plant Communities Spatial Boundaries	
The LAA and RAA are described in (11.2).	
Table 11.2 Vegetation and plant communities assessment areas	See General Comments – Spatial Boundaries. The preliminary local and regional assessment areas in the Draft EIS Guidelines have no ecological basis and no basis in the exercise of Section 35(1) rights.
11.2.2 Vegetation and Plant Communities Temporal Boundaries	
The EIS will describe the temporal boundaries, which will reflect the methodology described in Section 8 of these EIS Guidelines.	See General Comments – Spatial Boundaries.
11.2.3 Vegetation and Plant Communities Baseline	
The Composite and Terrestrial Ecosystem Mapping	Requested addition:

information will provide an understanding of the existing location and spatial extent of these ecosystems within the LAA using completed ecosystem mapping and field verification. Key indicators will include:	*In describing the physical and biological environment, the proponent should take an ecosystem approach that considers both scientific and Aboriginal traditional knowledge perspectives regarding ecosystem health and integrity. The proponent must identify and justify the indicators and measures of ecosystem health, social health and integrity used for analysis and relate these to the project's monitoring and follow-up measures.*[66] This subsection appears to lack descriptive information concerning the types of baseline data required for the assessment (e.g. compare to s.10.2.3 above). Requested addition (prior to the identification of key indicators): *The vegetation and plant communities baseline data will provide an understanding of the following:*[67] • *Important habitats found along the shoreline, banks, wetlands and floodplain;* • *Aquatic and riparian vegetation;* • *A description of the composition, distribution and abundance of terrestrial flora, including forest inventories;* • *Existing patterns of habitat and ecotype alteration,*

[66] CEAA. 2011. Guidelines for the Preparation of an Environmental Impact Statement for the Comprehensive Study Process Pursuant to the *Canadian Environmental Assessment Act*, at p.16.

[67] Government of Canada and Government of Newfoundland and Labrador. July 2008.Environmental Impact Statement Guidelines: Lower Churchill Hydroelectric Generation Project Newfoundland and Labrador Hydro, at p.26-27.

	disruption and destruction; and *• The resilience of species populations and their habitats.*[68]
• Total area (hectares) of each ecosystem type within the mapped area	
• Area (hectares) of each ecosystem by structural stage will be calculated for each of the mapped ecosystems using the final map databases. The 7 class structural stage classification system will be used (BCMOE and BCMFLNRO 1998).	
• Number of unique ecosystems mapped and their distribution within the technical study area described	
• Number of and distribution of rare plant species observed within the technical study area	
11.2.3.1 Rare and Sensitive Plant Communities	
The EIS will describe ecological communities at risk, which are identified as those ecological communities currently designated on the provincial Red and Blue lists,[69]	Requested addition: *The EIS will describe the composition, distribution and abundance of wetlands as classified using the Canada*

[68] CEAA. 2011. Guidelines for the Preparation of an Environmental Impact Statement for the Comprehensive Study Process Pursuant to the *Canadian Environmental Assessment Act*, at p.16.

[69] Red-listed species and subspecies have or are candidates for official Extirpated, Endangered or Threatened Status in B.C. Placing taxa on these lists flags them as being at risk and requiring investigation (Harper et al. 1994)). The Blue List includes "ecological communities, and indigenous species and subspecies of special concern (formerly vulnerable) in British Columbia" (Harper et al. 1994).

communities that are ranked 1 or 2 for Goal 2 of the Conservation Framework[70], and sensitive communities that are communities that are less resilient to disturbance such as wetlands.	*Wetland Classification System, and further characterized in terms of a functional analysis (e.g., habitat, water flow regulation, groundwater recharge).*[71]
The EIS will describe the methods used to identify rare and sensitive plant communities including:	Requested addition: • *Aboriginal traditional and local knowledge studies*
• Descriptions of rare and sensitive plant community posted on the Conservation Data Center's website, along with descriptions in local field guides (De Long in prep and MacKenzie and Moran 2004) will be used to identify occurrences within the technical study area	
• Evaluation and mapping of potential rare and sensitive communities will be conducted using the protocol developed by the Conservation Data Center. Field visits will be used as required to verify community occurrences	
• Field verification of rare and sensitive plant communities will be conducted using the protocol outlined in the *Field Manual for Describing Terrestrial Ecosystems* (Ministry of Forests and	

[70] Information on species rankings can be found on the Internet at http://www.env.gov.bc.ca/cdc/methods.html

[71] Government of Canada and Government of Newfoundland and Labrador. July 2008.Environmental Impact Statement Guidelines: Lower Churchill Hydroelectric Generation Project Newfoundland and Labrador Hydro, at p.26.

Range, and Ministry of Environment 2010)	
11.2.3.2 Rare Plants	
The EIS will describe rare plants, including both vascular and non-vascular species; focal species, including species listed in Schedule I of the SARA; provincially Red-listed and Blue-listed species; and species considered to be rare, based on the professional judgment of the rare plant specialist.	
The EIS will identify the locations of rare plants observed within the LAA. The methods used to identify rare plants will be based on the following:	Requested addition: • *Aboriginal traditional and local knowledge studies*
• Timing (Klinkenberg and Penny 2006)	
• Survey selection and intensity (Whiteaker et al. 1998; USDA FS and USDI BLM 1999)	
• Voucher collection (Klinkenberg and Penny 2006; RIC 1999a)	
The EIS will also discuss the results of reviews of established herbarium collections that include the University of British Columbia, the University of Alberta, the Royal Alberta Museum, the Royal British Columbia Museum and the Canadian National Museum.	
11.2.4 Potential Effects of the Project and Proposed Mitigation	
The EIS will assess how the Project has the potential to adversely affect terrestrial habitat.	Requested clarification: Is “terrestrial habitat” intended to be the same as “vegetation and plant communities”?
The potential to adversely affect Vegetation and Plant Communities will be assessed by taking into account the potential for the Project to result in changes to the following	As with the discrepancy between 10.2.3 and 10.2.4, we are unclear as to why the Draft EIS Guidelines are proposing a different set of key indicators in this section 11.2.4 compared to 11.2.3.

key aspects:	See General Comments – Valued Components
• The area of vegetation/plant community loss, assessed by overlaying the project activity zone on the ecosystem maps and conducting a GIS-based analysis of the area lost due to project activities.	
• The area of vegetation/plant community fragmentation, identified through GIS analysis.	
• The area of temporary vegetation/plant community disturbance will be assessed by overlaying the project activity zone on the ecosystem maps and conducting a GIS-based analysis of the area disturbed.	
• The long-term effects of maintenance of vegetation/plant communities in an early seral stage along the transmission line and around the dam site.	
Should potential adverse effects be identified, the potential mitigation measures will be identified and will include a description of how the mitigation measures can address the potential adverse effect.	
The EIS will describe project residual effects, and cumulative effects, if applicable, using the residual effects characterization described in Table 8.3. A statement of significance will be provided.	
11.2.5 Summary of Residual Effects on Vegetation and Plant Communities	
The EIS will summarize residual effects in a table format as shown in Table 8.4.	

11.3 References	
This subsection will include a list of supporting references used in this section of the EIS.	
12 WILDLIFE RESOURCES EFFECTS ASSESSMENT	
The EIS will summarize the wildlife resources effects based on the methodology described in Section 8 of these EIS Guidelines.	
Technical data will inform the effects assessment on wildlife resources. The interests of Aboriginal groups will be presented in the EIS in accordance with Section 15 and Section 20 of these EIS Guidelines. Where Aboriginal groups have identified interests in a VC, BC Hydro will incorporate additional baseline information as made available.	See General Comments – Aboriginal Traditional Knowledge; Aboriginal Rights and Interests
12.1 Valued Component Scoping and Rationale	
The wildlife resources VC rationale for selection is described in Table 12.1. Where available, supporting information that shows the importance of wildlife resources is included as part of the rationale for selection, as are regulatory requirements. Assessment of potential adverse effects on wildlife resources will be based on the following key species groups: butterflies and dragonflies; amphibians and reptiles; migratory birds; non-migratory game birds; raptors; bats; furbearers; and ungulates.	See General Comments – Valued Components.

Table 12.1 Wildlife resources valued component rationale	See General Comments – Valued Components.
12.2 Wildlife Resources	
12.2.1 Wildlife Resources Spatial Boundaries	
The LAA and RAA are described in Table 12.2.	
Table 12.2 Wildlife resource assessment areas	See General Comments – Spatial Boundaries The preliminary local and regional assessment areas in the Draft EIS Guidelines have no ecological basis and no basis in the exercise of Section 35(1) rights.
12.2.2 Wildlife Resources Temporal Boundaries	
The EIS will describe the temporal boundaries, which will reflect the methodology described in Section 8 of these EIS Guidelines.	

12.2.3 Wildlife Resources Baseline	Requested addition: *In describing the physical and biological environment, the proponent should take an ecosystem approach that considers both scientific and Aboriginal traditional knowledge perspectives regarding ecosystem health and integrity. The proponent must identify and justify the indicators and measures of ecosystem health, social health and integrity used for analysis and relate these to the project's monitoring and follow-up measures.* *For the biological environment, baseline data in the form of inventories alone are not sufficient to assess effects. The proponent shall consider the resilience of relevant species populations, communities and their habitats. The proponent shall summarize all pertinent historical information on the size and geographic extent of relevant animal populations as well as density, based on best available information. Where little or no information is available, specific studies shall be designed to gather further information on species populations and densities.*[72]
12.2.3.1 Butterflies and Dragonflies	
The butterfly and dragonfly baseline information will provide an understanding of the existing habitat and species within the LAA.	

[72] CEAA. 2011. Guidelines for the Preparation of an Environmental Impact Statement for the Comprehensive Study Process Pursuant to the *Canadian Environmental Assessment Act*, at p.16.

The baseline information will be collected following methodology guidelines presented in Inventory Methods for Terrestrial Arthropods (RIC 1998a). Surveys will focus on establishing presence/not-detected status for each listed taxon.	
12.2.3.2 Amphibians and Reptiles	
The amphibian and reptile baseline information will provide an understanding of the existing habitat and species within the LAA.	
All species observations will be summarized, but the focus will be placed upon the western toad (*Bufo boreas*) as it is a species of concern under the *Species at Risk Act*.	
The baseline information will be collected following the protocols outlined in Inventory Methods for Pond-breeding Amphibians and Painted Turtle (RIC 1998b) and Inventory Methods for Snakes (RIC 1998c).	
12.2.3.3 Migratory Birds	
The migratory bird baseline information will provide an understanding of the existing habitat, species, relative abundance, distribution and temporal use within the LAA for the following categories of migratory birds:	
• songbirds	
• waterfowl and shorebirds	
• marsh birds (Yellow Rail, American Bittern, Le Conte's Sparrow, Nelson's Sharp-tailed Sparrow)	
• woodpeckers	
• common nighthawk	
All species observations will be summarized.	

The baseline information will be collected following the protocols outlined in Inventory Methods for Forest and Grassland Songbirds (RIC 1999b), Inventory Methods for Swallows and Swifts (RIC 1998d), Inventory Methods for Riverine Birds: Harlequin Duck, Belted Kingfisher and American Dipper (RIC 1998e) and Inventory Methods for Waterfowl and Allied Species: Loons, Grebes, Swans, Geese, Ducks, American Coot and Sandhill Crane (RIC 1999c), Inventory Methods for Marsh Birds: Bitterns and Rails (RIC 1998f), Inventory Methods for Woodpeckers (RIC 1999d), and Inventory Methods for Nighthawk and Poorwill (RIC 1998g).	
12.2.3.4 Non-Migratory Game Birds	
The non-migratory game bird baseline information will provide an understanding of the existing habitat, species, relative abundance, distribution and location of lek sites (Sharp-tailed Grouse only) within the LAA.	
The baseline information will be collected following the methods outlined in Inventory Methods for Upland Game birds (RIC 1997a). The location of lek sites for Sharp-tailed Grouse within the Peace River valley will be included with baseline information where available and permitted.	
12.2.3.5 Raptors	
The raptor (eagles, hawks and owls) baseline information will provide an understanding of the existing habitat, location of observed nests, presence, abundance (as feasible) and distribution, and temporal use patterns within the LAA.	
All species observations will be summarized. The Broad-winged Hawk and Short-eared Owl are listed species while Northern Goshawk, Northern Harrier and Bald Eagle are	

species of regional concern.	
The baseline information will be collected following the protocols outlined in *Inventory Methods for Raptors* (RIC 2001) and *Inventory Methods for Owl Surveys* (Hausleitner 2006). Call playback and stand watch studies will be used to document and confirm the presence, possible abundance, and associated habitat use of select species of owls (including Northern Saw-whet, Short-eared, Great Horned, Great Gray, and Boreal Owls), Northern Goshawk, Northern Harrier and Broad-winged Hawk. An inventory of large raptor nest sites along the Peace River will be collected.	
12.2.3.6 Bats	
The bat baseline information will provide an understanding of the existing habitat, presence and characteristics of hibernacula, and location and characteristics of roost sites within the LAA.	
The baseline information will be collected following protocols outlined in *Inventory Methods for Bats* (RIC 1998h), using mist-netting (to confirm species presence), acoustic detection (to verify bat activity, quantify the level of activity and document species not captured), and radio-telemetry (to investigate day-roost selection).	
12.2.3.7 Furbearers	
The furbearer baseline information will provide an understanding of the population estimates and distribution of beavers, distribution of potential fisher den trees, seasonal habitat use, orientation and size of fisher home ranges within the LAA.	
All species observations will be summarized, but the focus will be on species that are provincially listed.	

The baseline information will be collected following the protocols outlined in Inventory Methods for Beaver and Muskrat (RIC 1998i) and Inventory Methods for Medium Sized Terrestrial Carnivores: Coyote, Red Fox, Lynx, Bobcat, Wolverine, Fisher and Badger (RIC 1997b).	
12.2.3.8 Ungulates	
The ungulate (moose, elk and mule deer) baseline information will provide an understanding of the population estimates, habitat use and movement patterns, and birthing site locations and characteristics within the LAA.	Requested amendment: *The ungulate (moose, elk and mule deer) baseline information will provide an understanding of the population estimates, habitat use, ~~and~~ movement and migration patterns, including river crossings, and birthing site locations and characteristics within the LAA.* [73]
The baseline information will be collected following the protocols outlined in: Aerial-based Inventory Methods for Selected Ungulates: Bison, Mountain Goat, Mountain Sheep, Moose, Elk, Deer and Caribou (RIC 2002); Ground-Based Inventory Methods for Selected Ungulates (Moose, Elk and Deer) (RIC 1998j); and Ground-Based Inventory Methods for Ungulate Snow-track Surveys (D'Eon et al. 2006).	

[73] Government of Canada and Government of Newfoundland and Labrador. July 2008.Environmental Impact Statement Guidelines: Lower Churchill Hydroelectric Generation Project Newfoundland and Labrador Hydro, at p.27.

12.2.4 Potential Effects of the Project and Proposed Mitigation	
The EIS will assess how the Project has the potential to adversely affect habitat available for wildlife resources, as represented by the key species groups.	
The potential to adversely affect wildlife resources will be assessed by taking into account the potential for the Project to result in changes to the following key aspects:	
• permanent and temporary habitat alteration and fragmentation	
• disturbance and/or displacement	
• potential for direct and indirect mortality to individuals	
Should potential adverse effects be identified, the potential mitigation measures will be identified and will include a description of how the mitigation measures can address the potential adverse effects.	
The EIS will describe project residual effects, and cumulative effects, if applicable, using the residual effects characterization described in Table 8.3. A statement of significance will be provided.	
12.2.5 Summary of Residual Effects on Wildlife Resources	
The EIS will summarize residual effects in a table format as shown in Table 8.4.	
12.3 References	
This subsection will include a list of supporting references	

used in this section of the EIS.	
13 GREENHOUSE GASES EFFECTS ASSESSMENT	
The EIS will describe the greenhouse gases (GHG) effects based on the methodology described in Section 8 of these EIS Guidelines.	
Technical data will inform the GHG effects assessment. The interests of Aboriginal groups will be presented in the EIS in accordance with Section 15 and Section 20 of these EIS Guidelines. Where Aboriginal groups have identified interests in a VC, BC Hydro will incorporate additional baseline information as made available.	See General Comments – Aboriginal Traditional Knowledge See General Comments – Aboriginal Rights
13.1 Valued Component Scoping and Rationale	
The greenhouse gases VC rationale for selection is described in Table 13.1. Where available, supporting information that shows importance of the VC is included as part of the rationale for selection, as are regulatory requirements.	
Table 13.1 Greenhouse gases valued component rationale	See General Comments – Valued Components.
13.2 Greenhouse Gases	
13.2.1 Greenhouse Gases Spatial Boundaries	
The LAA and RAA are described in Table 13.2.	

Table 13.2 Greenhouse gases assessment areas	See General Comments – Spatial Boundaries.
13.2.2 Greenhouse Gases Temporal Boundaries	
The EIS will describe the temporal boundaries, which will reflect the methodology described in Section 8 of these EIS Guidelines.	
13.2.3 Greenhouse Gases Baseline	
The GHG baseline information will provide an understanding of the potential net contribution of GHG by using site specific mass balance models to account for net GHG emissions under current conditions using CO_2 equivalents.	
13.2.4 Potential Effects of the Project and Proposed Mitigation	
The EIS will provide an assessment of how the Project has the potential to result in a net change in GHG emissions and GHG intensity based on inundation over a 100-year period.	
Methods developed by the Intergovernmental Panel on Climate Change (IPCC) will be used to estimate emissions associated with land use conversion to the reservoir as well as construction-phase emissions based on estimates for quantities of fuel, electricity and materials expected to be required during project development.	
This section of the EIS will provide:	
• An estimate of the multi-year GHG emissions profile associated with the construction and ongoing operations of the Project	

• An estimate of the net change in GHG emission from current conditions to post-inundation scenarios	
• A comparison of the GHG profile of the Project with other electricity supply options	Requested amendment: • *A comparison of the GHG profile of the Project with other electricity supply and demand-management options*
Should potential adverse effects be identified, the potential mitigation measures will be identified and will include a description of how the mitigation measures can address the potential adverse effects.	
The EIS will describe project residual effects, and cumulative effects, if applicable, using the residual effects characterization described in Table 8.3. A statement of significance will be provided.	
13.2.5 Summary of Residual Effects for Greenhouse Gas	
The EIS will summarize residual effects in a table format as shown in Table 8.4.	
13.3 References	
This subsection will include a list of supporting references used in this section of the EIS.	
VOLUME 3 – ECONOMIC AND LAND AND RESOURCE USE EFFECTS ASSESSMENT	
14 ECONOMIC EFFECTS ASSESSMENT	
The EIS will summarize the economic effects based on the methodology described in Section 8 of these EIS Guidelines.	Requested addition: *In describing the socio-economic environment, the proponent must provide information on the functioning and health of the socio-economic environment, encompassing a broad range of*

	matters that affect the people and communities in the study area in a way that recognizes interrelationships, system functions and vulnerabilities. A description of the rural and urban settings likely to be affected by the project should be provided.[74] *In considering the local social and economic effects of the Project, the Proponent shall have due regard for the attitudes, beliefs and perceptions of local residents, and how these are grounded in their culture, social organizations and historical experience.*[75]
Technical data will inform the economic effects assessment. The interests of Aboriginal groups will be presented in the EIS in accordance with Section 15 and Section 20 of these EIS Guidelines. Where Aboriginal groups have identified interests in a VC, BC Hydro will incorporate additional baseline information as made available.	See General Comments – Aboriginal Traditional Knowledge See General Comments – Aboriginal Rights
14.1 Valued Component Scoping and Rationale	
Economic effects arise from changes to economic transactions, such as the Project's use of goods and	

[74] CEAA. 2011. Guidelines for the Preparation of an Environmental Impact Statement for the Comprehensive Study Process Pursuant to the *Canadian Environmental Assessment Act*, at p.17..

[75] Government of Canada and Government of Newfoundland and Labrador. July 2008.Environmental Impact Statement Guidelines: Lower Churchill Hydroelectric Generation Project Newfoundland and Labrador Hydro, at p.34.

services, employment of direct and indirect labour, and contracting and business opportunities, as well as Project-induced changes to government revenues. Government revenues will be reported in the Project Benefits section. Economic VCs and rationale for selection are described in Table 14.1.	
Table 14.1 Economic conditions valued components rationale	See General Comments – Valued Components. The preliminary list of valued components overlooks aspects of the local economy that would be adversely affected by the Project, including agriculture and tourism. The Project would likely have adverse effects on other industries in the region with respect to materials, and not just labour, resulting in inflation for both goods and services.
14.2 Local Government Revenue	
14.2.1 Local Government Revenue Spatial Boundaries	
The LAA and RAA are described in Table 14.2.	
Table 14.2 Local government revenue assessment areas	See General Comments – Spatial Boundaries
14.2.2 Local Government Revenue Temporal Boundaries	
The EIS will describe the temporal boundaries, which will reflect the methodology described in Section 8 of these EIS Guidelines.	
14.2.3 Local Government Revenue Baseline	
The EIS will describe the current local government revenue baseline and likely future local government revenue and expenditure streams. Key indicators will include:	

• Local government expenditures on specific programs and services	
• Local government revenue from BC Hydro grants-in-lieu payments, property taxes, transfers, income taxes, consumption taxes and royalties	
Information sources for the baseline will include publicly available federal, provincial and local government data and reports and additional information made available to BC Hydro.	
14.2.4 Potential Effects of the Project and Proposed Mitigation	
The EIS will assess how the Project has the potential to adversely affect local government revenues.	
The potential to adversely affect local government revenues will be assessed by taking into account the potential for the Project to result in changes to the following key aspects:	
• Legal and policy factors that may influence the effects	
• The British Columbia Input-Output Model (BC Stats, 2011a) will be used to model the timing and magnitude of project-related transactions	
Should potential adverse effects be identified, the potential mitigation measures will be identified and will include a description of how the mitigation measures can address the potential adverse effects.	
The EIS will describe project residual effects, and cumulative effects, if applicable, using the residual effects characterization described in Table 8.3. A statement of significance will be provided.	

14.2.5 Summary of Residual Effects on Local Government Revenue	
The EIS will summarize residual effects in a table format as shown in Table 8.4.	
14.3 Labour Market	
14.3.1 Labour Market Spatial Boundaries	
The LAA and RAA are described in Table 14.3.	
Table 14.3 Labour market assessment areas	See General Comments – Spatial Boundaries
14.3.2 Labour Market Temporal Boundaries	
The EIS will describe the temporal boundaries, which will reflect the methodology described in Section 8 of these EIS Guidelines.	
14.3.3 Labour Market Baseline	
The EIS will describe labour market baseline and forecast conditions. The labour market baseline data collection will focus on skills and occupations required by the Project, using the following key indicators:	
• Number of persons by occupation and industry affiliation, and available skills in the local labour force, turnover rates.	
• Unemployment rates, demographics and characteristics, length of unemployment, job search period;	
• Contribution of non-resident workers in the North East Development Region's labour force; and,	

• Estimates of skill shortages and surpluses.	
Baseline information sources will include published employment studies and statistics, and information made available to BC Hydro from local, regional, provincial and federal governments (e.g., BC Stats 2011b) and from interviews with local, regional and provincial employment and trade organizations.	
14.3.4 Potential Effects of the Project and Proposed Mitigation	
The EIS will assess how the Project has the potential to adversely affect the labour market.	
The potential to adversely affect the labour market will be assessed by taking into account the potential for the Project to result in changes to the following key aspects:	
• The direct Project's needs for labour relative to the expected availability and type of skills of the persons in the LAA	
• The indirect project employment calculated using the BC Input-Output Model	
• A comparision of the project labour requirements against the baseline and forecast local labour supply and demand by skill category where possible (Work B.C. 2009)	
Should potential adverse effects be identified, the potential mitigation measures will be identified and will include a description of how the mitigation measures can address the potential adverse effects.	
The EIS will describe project residual effects, and cumulative effects, if applicable, using the residual effects characterization described in Table 8.3. A statement of	

significance will be provided.	
14.3.5 Summary of Residual Effects on Labour Market	
The EIS will summarize residual effects in a table format as shown in Table 8.4.	
14.4 Regional Economic Development	
14.4.1 Regional Economic Development Spatial Boundaries	
The LAA and RAA are described in Table 14.4.	
Table 14.4 Regional economic development assessment areas	See General Comments – Spatial Boundaries
14.4.2 Regional Economic Development Temporal Boundaries	
The EIS will describe the temporal boundaries, which will reflect the methodology described in Section 8 of these EIS Guidelines.	
14.4.3 Regional Economic Development Baseline	
The EIS will describe current and likely future regional economic development activity. The regional economic development baseline data collection will focus on the types of businesses and contractors required by the Project, as well as those currently required and forecast to be required by other industries in the region, using the following key indicators:	
• regional business and contracting profile	

• regional business and contracting capabilities and capacity	
Information sources will include published studies and statistics, and information made available to BC Hydro from the private sector, industry and trade organizations, and local, regional and provincial organizations and governments.	
14.4.4 Potential Effects of the Project and Proposed Mitigation	
The EIS will assess how the Project has the potential to adversely affect regional economic development.	
The potential to adversely affect regional economic development will be assessed by taking into account the potential for the Project to result in changes to the following key aspects:	
• Project contract opportunities in the LAA.	
• A comparison of the Project's contracting requirements with the regional business and contracting profile, capabilities and capacity	
Should potential adverse effects be identified, the potential mitigation measures will be identified and will include a description of how the mitigation measures can address the potential adverse effects.	
The EIS will describe project residual effects, and cumulative effects, if applicable, using the residual effects characterization described in Table 8.3. A statement of significance will be provided.	

14.4.5 Summary of Residual Effects on Regional Economic Development	
The EIS will summarize residual effects in a table format as shown in Table 8.4.	
14.5 References	
This subsection will include a list of supporting references used in this section of the EIS.	
15 TRADITIONAL LANDS AND RESOURCE USE EFFECTS ASSESSMENT	
The EIS will contain an assessment of the potential adverse effects of the Project on the current use of lands and resources by Aboriginal persons for traditional purposes, including activities conducted in the exercise of treaty rights and asserted Aboriginal rights ("Current Use of Lands and Resources for Traditional Purposes").	See General Comments – Current Use of Lands and Resources by Aboriginal Persons
Technical data will inform the effects assessment on current use of lands and resources for traditional purposes. Requirements for Aboriginal interests and information requirements are addressed in Section 20 of these EIS Guidelines. Where Aboriginal groups have identified interests in a VC, BC Hydro will incorporate additional baseline information as made available.	See General Comments – Aboriginal Traditional Knowledge See General Comments – Aboriginal Rights
15.1 Valued Component Scoping and Rationale	
The potential for effects on current use of lands and resources for traditional purposes arise from the Project's use of land or resources. Table 15.1 outlines the rationale for selection of this VC based on Aboriginal interests and	

federal regulatory requirements.	
Table 15.1 Current use of lands and resources for traditional purposes valued component rationale	See General Comments – Valued Components.
15.2 Current Use of Lands and Resources for Traditional Purposes	
15.2.1 Current Use of Lands and Resources for Traditional Purposes Spatial Boundaries	
The LAA and RAA are described in Table 15.2.	
Table 15.2 Current use of lands and resources for traditional purposes assessment areas	See General Comments – Spatial Boundaries The preliminary local and regional assessment areas in the Draft EIS Guidelines have no ecological basis and no basis in the exercise of Section 35(1) rights.
15.2.2 Current Use of Lands and Resources for Traditional Purposes Temporal Boundaries	
The EIS will describe the temporal boundaries defined for the assessment of the potential adverse effects of the Project on current use of lands and resources for traditional purposes in accordance with the methodology set out in Section 8 of these EIS Guidelines.	
15.2.3 Current Use of Lands and Resources for Traditional Purposes Baseline	
The EIS will describe the current use of lands and resources for traditional purposes by Aboriginal groups within the LAA and RAA, using the following key indicators:	
• Current use of lands and resources for hunting, fishing and trapping activities, including the location of the activity, the species targeted, and the	

traditional uses of the harvested animals	
• Current use of lands and resources for activities other than hunting, fishing and trapping, by Aboriginal groups, including the nature, location and traditional use purpose	
Information sources will include publicly available information and information as made available to BC Hydro, including traditional land use studies, consultations between Aboriginal groups and BC Hydro, consultations between Aboriginal groups and the provincial and federal governments.	Requested addition: *…including traditional land use studies, <u>Aboriginal traditional and community knowledge studies</u>, consultations…*
15.2.4 Potential Effects of the Project and Proposed Mitigation	
The EIS will assess how the Project has the potential to adversely affect current use of lands and resources by Aboriginal persons for traditional purposes.	
The potential to adversely affect current use of lands and resources by Aboriginal persons for traditional purposes will be assessed by taking into account the potential for the Project to result in changes to key aspects:	
• Use of and access to lands used for traditional purposes	
• Availability of harvested species based on the results of the assessment of the potential effects of the Project on fish and fish habitat, vegetation and plant communities, and wildlife resources	
Should potential adverse effects be identified, the potential mitigation measures will be identified and will include a description of how the mitigation measures can address the potential adverse effects.	
The EIS will describe project residual effects, and	

cumulative effects, if applicable, using the residual effects characterization described in Table 8.3. A statement of significance will be provided.	
15.2.5 Summary of Residual Effects for Current Use of Lands and Resources for Traditional Purposes	
The EIS will summarize the residual adverse effects on the current use of lands and resources for traditional purposes VC in a table format as shown in Table 8.4.	
15.3 References	
This subsection will include a list of supporting references used in this section of the EIS.	

16 LAND AND RESOURCE USE EFFECTS ASSESSMENT	
The EIS will summarize the Land and Resource Use effects based on the methodology described in Section 8 of these EIS Guidelines.	In order for the EIS to be of utility for understanding cumulative effects of the proposed Project on First Nations' Section 35(1) rights, a thorough description of the location and extent of lands "taken up" by the Crown since the time of Treaty is required. This information is requested at the appropriate points below.
Technical data will inform the effects assessment on land and resource use. The interests of Aboriginal groups will be presented in the EIS in accordance with Section 15 and Section 20 of these EIS Guidelines. Where Aboriginal groups have identified interests in a VC, BC Hydro will incorporate additional baseline information as made available.	See General Comments – Aboriginal Traditional Knowledge See General Comments – Aboriginal Rights

16.1 Valued Component Scoping and Rationale	
The land and resource use VCs are agriculture, forestry, oil, gas and energy, minerals and aggregates, harvest of fish and wildlife resources, outdoor recreation and tourism, navigation (air and water), and visual resources. Section 23.4 will summarize in a table format the renewable resources that have been considered in the various sections of the EIS.	Requested amendment: *The land and resource use VCs are agriculture, forestry and woodcutting, oil, gas and energy, minerals and aggregates, harvest of fish and wildlife resources, plant and berry harvesting, outdoor recreation and tourism, navigation (air and water), and visual resources*
Table 16.1 outlines the rationale for selection of VCs in the Land and Resource Use section.	
Table 16.1 Land and resource use valued components rationale	See General Comments – Valued Components
16.2 Agriculture	
16.2.1 Agriculture Spatial Boundaries	
The LAA and RAA are described in 16.2.	
Table 16.2 Agriculture assessment areas	See General Comments – Spatial Boundaries
16.2.2 Agriculture Temporal Boundaries	
The EIS will describe the temporal boundaries, which will reflect the methodology described in Section 8 of these EIS Guidelines.	
16.2.3 Agriculture Baseline	
The agricultural baseline information will provide an understanding of the current agricultural land base,	Requested amendment: *The agricultural baseline information will provide an*

operations and systems, including the following key indicators:	*understanding of the historical development of agricultural activities within the LAA and the current agricultural land base, operations and systems,* Request that this aspect be expanded to consider the effects of the creation of the flood reserve on current agricultural activities within the LAA.
• Agricultural land capability ratings, using updated field observations or existing provincial mapping, and updated climatic capability using current climate data (see Kenk and Cotic 1983)	
• Agricultural suitability of lands within the project activity zone for growing different crops, determined using updated or available capability ratings, and rated as well suited, suited or not suited for various crops using methodologies similar to the former Bertrand and Hughes-Games (1991) and MacDonald and Wang (1998)	
• Agricultural significance ratings, to reflect the likelihood of each area being used for agricultural production in the future. The rating will be based on land capability ratings, as well as constraints to agricultural use (such as location, access, parcel size, land ownership or tenure, and land use plans or designations)	
• Agricultural land use, determined from recent air photos of the project area, Crown land tenures, field observations and land owner/operator interviews	
• Agricultural tenure on Crown lands, determined from provincial data sources, within and near the project activity zone	
• Current and expected future agricultural operations and practices, determined through interviews with owners and operators of potentially affected	

agricultural operations, as well as through review of agricultural census information for the LAA	
• Local and regional agricultural economic activity, determined through interviews with relevant agricultural associations, representatives of agriculturally related industries and representatives of government agencies	Recommendation that interviews be undertaken with local landowners and farmers.
• Local and regional food production and consumption estimates, determined through interviews with relevant agricultural associations, representatives of agriculturally related industries and representatives of government agencies.	Recommendation that interviews be undertaken with local landowners and farmers.
16.2.4 Potential Effects of the Project and Proposed Mitigation	
The EIS will assess how the Project has the potential to adversely affect agriculture.	
The potential to adversely affect agriculture will be assessed by taking into account the potential for the Project to result in changes to the following key aspects:	
• An estimate of the loss of agricultural land, including a description of these changes to the agricultural resource base on a local, regional and provincial scale	
• Description of effects to individual farm operations, including loss of land, effects to farm infrastructure, and changes to farm activities	
• Quantification of projected immediate and longer-term effects to local, regional and provincial agricultural economies. This will include estimating changes in agricultural costs and revenues at the farm level, changes in opportunities for potential	

new agricultural economic activity, and changes to primary and secondary agricultural economic activity	
• Identification of potential changes to local food production and any changes to the ratio of food production to food consumption (a measure of food self-reliance)	
Should potential adverse effects be identified, the potential mitigation measures will be identified and will include a description of how the mitigation measures can address the potential adverse effects.	
The EIS will describe project residual effects, and cumulative effects, if applicable, using the residual effects characterization described in Table 8.3. A statement of significance will be provided.	
16.2.5 Summary of Residual Effects on Agriculture	
The EIS will summarize the residual effects in a table format as shown in Table 8.4.	
16.3 Forestry	
16.3.1 Forestry Spatial Boundaries	
The LAA and RAA are described in Table 16.3.	
Table 16.3 Forestry assessment areas	
16.3.2 Forestry Temporal Boundaries	
The EIS will describe the temporal boundaries, which will reflect the methodology described in Section 8 of these EIS Guidelines.	

16.3.3 Forestry Baseline	
The EIS will provide an overview of forest management planning and forest industry activities and characteristics within the LAA. The future case will consider forest management plans, including any constraints on timber harvesting or land use management. Baseline information using the following key indicators will be collected:	Requested amendment: ~~*The EIS will provide an overview of forest management planning and forest industry activities and characteristics within the LAA*~~. *The forestry baseline information will provide an understanding of the historical development of forestry activities within the LAA and the current forest industry activities and characteristics within the LAA,*
• Timber harvesting land base	
• Site productivity	
• Annual Allowable Cut	
• Forest sector employment	
• Forest sector based government revenue	
The forest industry activity information will be collected from industry and Ministry of Forests, Lands and Natural Resource Operations sources. Spatial indicators will be collected from an analysis of GIS data obtained from the same sources.	
16.3.4 Potential Effects of the Project and Proposed Mitigation	
The EIS will assess how the Project has the potential to adversely affect forestry.	
The potential to adversely affect forestry will be assessed by taking into account the potential for the Project to result in changes to the following key aspects:	
• Land use, resource use, access and activities related to industrial forestry use	
• Crown forest management	

The spatial analysis will identify tenured interests or facilities occurring within the Project activity zone that may be alienated from future use, or affected by changes in Crown land use and access during construction and operations.	
Should potential adverse effects be identified, the potential mitigation measures will be identified and will include a description of how the mitigation measures can address the potential adverse effects.	
The EIS will describe project residual effects, and cumulative effects, if applicable, using the residual effects characterization described in Table 8.3. A statement of significance will be provided.	
16.3.5 Summary of Residual Effects on Forestry	
The EIS will summarize the residual effects in a table format as shown in Table 8.4.	
16.4 Oil, Gas and Energy	
16.4.1 Oil, Gas and Energy Spatial Boundaries	
The LAA and RAA are described in Table 16.4.	
Table 16.4 Oil, gas and energy assessment areas	
16.4.2 Oil, Gas and Energy Temporal Boundaries	
The EIS will describe the temporal boundaries, which will reflect the methodology described in Section 8 of these EIS Guidelines.	

16.4.3 Oil, Gas and Energy Baseline	
The EIS will describe current conditions and recent trends related to oil, gas and energy sectors within the LAA, using the following key indicators:	Requested amendment: *The EIS will describe historical development, current conditions and recent trends related to oil, gas and energy sectors within the LAA…*
• Tenured oil, gas and energy activities, operations and facilities	
• Production activity	
• Industry characteristics including new extraction technologies	
Spatial indicators will be collected using a GIS analysis. Other industry data will be collected from the Oil and Gas Commission, Canadian Association of Petroleum Producers and B.C. Ministry of Energy and Mines. Interviews and information requests will be made with these same agencies for information pertaining to production activity and investments.	
16.4.4 Potential Effects of the Project and Proposed Mitigation	
The EIS will assess how the Project has the potential to adversely affect oil, gas and energy sectors.	
The potential to adversely affect the oil, gas and energy sectors will be assessed by taking into account the potential for the Project to result in changes to the following key aspects:	
• Land use, resource use, access and activities for the oil, gas and energy sectors	
Should potential adverse effects be identified, the potential mitigation measures will be identified and will include a	

description of how the mitigation measures can address the potential adverse effects.	
The EIS will describe project residual effects, and cumulative effects, if applicable, using the residual effects characterization described in Table 8.3. A statement of significance will be provided.	
16.4.5 Summary of Residual Effects on Oil and Gas	
The EIS will summarize the residual effects in a table format as shown in Table 8.4.	
16.5 Minerals and Aggregates	
16.5.1 Minerals and Aggregates Spatial Boundaries	
The LAA and RAA are described in Table 16.5.	
Table 16.5 Mineral and aggregates assessment areas	
16.5.2 Minerals and Aggregates Temporal Boundaries	
The EIS will describe the temporal boundaries, which will reflect the methodology described in Section 8 of these EIS Guidelines.	
16.5.3 Minerals and Aggregates Baseline	
The EIS will provide an overview of current conditions related to mineral and aggregate resource development within the LAA, using the following key indicators:	Requested amendment: The EIS will provide an overview of historical development, current conditions, and recent trends related to mineral and aggregate resource development within the LAA …
• Record of metal, industrial mineral, and aggregate potential	

• Record of exploration and development	
• Historic production records	
• Remaining mine, quarry or pit life	
• Existing mineral or aggregate tenures	
• Local and regional aggregate pricing and current and forecast consumption profile	
Spatial data will be collected (e.g., mineral potential, tenures, mineral reserves, current and past producers). Baseline information will be collected from government databases (e.g., mineral potential, mineral tenures, record of development activity), and interviews with Ministry of Transportation and Infrastructure staff, and other information as made available to BC Hydro.	
16.5.4 Potential Effects of the Project and Proposed Mitigation	
The EIS will assess how the Project has the potential to adversely affect the mineral and aggregate sector.	
The potential to adversely affect the mineral and aggregate sector will be assessed by taking into account the potential for the Project to result in changes to the following key aspects:	
• Land use, resource use, access and activities related to industrial mineral and aggregate utilization within the Project activity zone	
• The Project's consumption of local aggregate deposits for construction activities	
• Any new or improved access to aggregate sources created by the Project	
Spatial analysis will be used to determine the Project's	

effect on minerals and aggregates in the context of the market for minerals and aggregates.	
Should potential adverse effects be identified, the potential mitigation measures will be identified and will include a description of how the mitigation measures can address the potential adverse effects.	
The EIS will describe project residual effects, and cumulative effects, if applicable, using the residual effects characterization described in Table 8.3. A statement of significance will be provided.	
16.5.5 Summary of Residual Effects on Minerals and Aggregates	
The EIS will summarize the residual effects in a table format as shown in Table 8.4.	
16.6 Harvest of Fish and Wildlife Resources	
16.6.1 Harvest of Fish and Wildlife Resources Spatial Boundaries	
The LAA and RAA are described in Table 16.6.	
Table 16.6 Harvest of fish and wildlife resources assessment areas	
16.6.2 Harvest of Fish and Wildlife Resources Temporal Boundaries	
The EIS will describe the temporal boundaries, which will reflect the methodology described in Section 8 of these EIS Guidelines.	

16.6.3 Harvest of Fish and Wildlife Resources Baseline	
The EIS will provide an overview of current conditions related to the public and tenured harvest of fish and wildlife resources within the LAA, using the following key indicators:	Requested amendment: *The EIS will provide an overview of historical development, current conditions, and recent trends related to the public and tenured harvest of fish and wildlife resources within the LAA.*
Public Hunting and Fishing:	
• Public hunting and fishing licence sales	
• Public hunting and fishing areas	
• Public hunting and fishing harvest information, including numbers and species	
• Angler creel survey results within the LAA	
Tenured Trapping:	
• Tenured trapline areas	
• Tenured trapline infrastructure (e.g., cabins, trails)	
• Tenured trapline harvest volumes and areas	
• Tenured trapline operating and economic information	
• Aboriginal employment or use of tenured traplines	
Tenured Guide-Outfitting:	
• Tenured guide outfitter areas	
• Tenured guide outfitter infrastructure (e.g., cabins, trails)	
• Tenured guide-outfitter harvest volumes and areas	
• Tenured guide-outfitter operating and economic information	

• Aboriginal participation in tenured guide outfitting operations	
Public hunting data will be acquired from BCMOE hunter harvest data, studies on economic effects and value of resident hunting, wildlife studies, interviews with local rod and gun clubs, traditional land use studies, and other data as made available to BC Hydro.	
Fishing data will be acquired from BCMOE licence sales, creel survey results (LGL 2010), regional angling surveys, fisheries studies, interviews with rod and gun clubs, traditional land use studies, and other data as made available to BC Hydro.	
Trapping data will be acquired from trapper interviews, trapline tenure and harvest data from provincial government sources, and other information as made available to BC Hydro.	
Data will be acquired from wildlife studies, BCMOE hunter harvest data, guide outfitter licence areas, Guide Outfitting Association of BC database, and studies on the economic effects and value of guided hunting, and other information as made available to BC Hydro.	
16.6.4 Potential Effects of the Project and Proposed Mitigation	
The EIS will assess how the Project has the potential to adversely affect the harvest of fish and wildlife resources.	
The potential to adversely affect harvest of fish and wildlife resources will be assessed by taking into account the potential for the Project to result in changes to the following key aspects:	
• Use of and access to hunting and fishing areas	

• Use of and access to trapline areas	
• Use of and access to guide outfitter areas	
• Tenured areas and specific harvest areas within tenured areas, using spatial analysis	
• Availability of harvested species based on the results of the assessment of the potential effects of the Project on fish and fish habitat and on wildlife	
Should potential adverse effects be identified, the potential mitigation measures will be identified and will include a description of how the mitigation measures can address the potential adverse effects.	
The EIS will describe project residual effects, and cumulative effects, if applicable, using the residual effects characterization described in Table 8.3. A statement of significance will be provided.	
16.6.5 Summary of Residual Effects on Harvest of Fish and Wildlife Resources	
The EIS will summarize the residual effects in a table format as shown in Table 8.4.	
16.7 Outdoor Recreation and Tourism	
16.7.1 Outdoor Recreation and Tourism Spatial Boundaries	
The LAA and RAA are described in Table 16.7.	

Table 16.7 Outdoor recreation and tourism assessment areas	
16.7.2 Outdoor Recreation and Tourism Temporal Boundaries	
The EIS will describe the temporal boundaries, which will reflect the methodology described in Section 8 of these EIS Guidelines.	
16.7.3 Outdoor Recreation and Tourism Baseline	
The EIS will present an overview of current conditions related to outdoor recreation and tourism within the LAA, using the following key indicators:	Requested amendment: *The EIS will present an overview of historical development, current conditions, and recent trends related to outdoor recreation and tourism within the LAA…*
• Outdoor recreation features and amenities, including recreation sites, trails and parks	
• Outdoor recreation use levels	
• Tourism features and amenities, including visitor centres, tourist accommodations, and attractions	
• Regional tourism visitor levels	
• Recreation activities undertaken on the land base, including activities, locations and seasonal nature of activities	
• Commercial outdoor recreation interests	
Spatial data will be collected through a GIS analysis using available provincial data and data from other sources. Information sources will include information from and interviews with government agencies, local recreation and tourism groups, and other information as made available to BC Hydro.	

16.7.4 Potential Effects of the Project and Proposed Mitigation	
The EIS will assess how the Project has the potential to adversely affect outdoor recreation and tourism.	
The potential to adversely affect outdoor recreation and tourism will be assessed by taking into account the potential for the Project to result in changes to the following key aspects:	
• Outdoor recreation sites, trails and parks, using spatial analysis	
• Visitor centres, tourist accommodations, and attractions	
• Outdoor recreation use and regional tourism visitor levels	
Should potential adverse effects be identified, the potential mitigation measures will be identified and will include a description of how the mitigation measures can address the potential adverse effects.	
The EIS will describe project residual effects, and cumulative effects, if applicable, using the residual effects characterization described in Table 8.3. A statement of significance will be provided.	
16.7.5 Summary of Residual Effects on Outdoor Recreation and Tourism	
The EIS will summarize the residual effects in a table format as shown in Table 8.4.	

16.8 Navigation	
16.8.1 Navigation Spatial Boundaries	
The LAA and RAA are described in Table 16.8.	
Table 16.8 Navigation assessment areas	
16.8.2 Navigation Temporal Boundaries	
The EIS will describe the temporal boundaries, which will reflect the methodology described in Section 8 of these EIS Guidelines.	
16.8.3 Navigation Baseline	
The EIS will present an overview of current conditions related to navigation within the LAA, using the following key indicators:	Requested amendment: *The EIS will present an overview of historical development, current conditions, and recent trends related to navigation within the LAA…*
• Defined existing navigable waters using the methodology outlined in the River Classification System established for rivers in British Columbia	
• Current navigation use (e.g., vessel/boat traffic) of the defined navigable waters for transportation, recreation and commercial purposes	
• Air navigation routes and airports	
• The ice bridge at Shaftesbury	
Information sources will include information from and interviews with government agencies, local boating groups, and other information as made available to BC Hydro.	

16.8.4 Potential Effects of the Project and Proposed Mitigation	
The EIS will assess how the Project has the potential to adversely affect navigation.	
The potential to adversely affect navigation will be assessed by taking into account the potential for the Project to result in changes to the following key aspects:	
• The navigability and navigation use of defined navigable waters existing, altered or created by the Project	
• Potential navigation hazards in waterways	
• Micro-climate changes (Section 9.3.1) on aviation use at the Fort St. John airport	
• Visibility of structures and catenary wiring, and proposed temporary aviation restrictions	
• Operation of the Shaftesbury ice bridge using the results of the CRISSP ice model described in Section 9.2.4	
Should potential adverse effects be identified, the potential mitigation measures will be identified and will include a description of how the mitigation measures can address the potential adverse effects.	
The EIS will describe project residual effects, and cumulative effects, if applicable, using the residual effects characterization described in Table 8.3. A statement of significance will be provided.	
16.8.5 Summary of Residual Effects on Navigation	
The EIS will summarize the residual effects in a table	

format as shown in Table 8.4.	
16.9 Visual Resources	
16.9.1 Visual Resources Spatial Boundaries	
The LAA and RAA are described in Table 16.9.	
Table 16.9 Visual resources assessment areas	
16.9.2 Visual Resources Temporal Boundaries	
The EIS will describe the temporal boundaries, which will reflect the methodology described in Section 8 of these EIS Guidelines.	
16.9.3 Visual Resources Baseline	
The EIS will identify current visual resource conditions within the LAA that may be changed by the Project, using the following key indicators:	
• Representative visual receptor sites selected from provincially designated Visual Landscape Inventory (VLI) scenic area viewpoints overlooking the reservoir and dam site	
• A public viewpoint of the river from Hudson's Hope, and from near the dam site	
For each site, a photomontage will be used to show current conditions. The VLI classifies the provincial land base into visually sensitive areas versus not visually sensitive areas and, for each visually sensitive unit in terms of its existing visual condition, visual absorption capability, biophysical and viewing characteristics, determines or recommends a visual sensitivity class. The provincial Visual Landscape	

Inventory receptor sites to be used in the baseline are shown in Table 16.10.	
Table 16.10 Proposed visual resources receptor sites	
16.9.4 Potential Effects of the Project and Proposed Mitigation	
The EIS will assess how the Project has the potential to adversely affect visual resources.	
The potential to adversely affect visual resources will be assessed by taking into account the potential for the Project to result in changes to the following key indicators:	
• The visibility of project features from selected receptor sites using GIS-based viewshed modelling	
• Scenic values predicted using photomontages and assessed according to the Visual Impact Assessment Guidebook's visual impact summary form (BCMOF, 2001).	
Should potential adverse effects be identified, the potential mitigation measures will be identified and will include a description of how the mitigation measures can address the potential adverse effects.	
The EIS will describe project residual effects, and cumulative effects, if applicable, using the residual effects characterization described in Table 8.3. A statement of significance will be provided.	
16.9.5 Summary of Residual Effects on Visual Resources	
The EIS will summarize the residual effects in a table format as shown in Table 8.4.	

16.10 References	
This subsection will include a list of supporting references used in this section of the EIS.	
VOLUME 4 – SOCIAL, HERITAGE, AND HEALTH EFFECTS ASSESSMENT	
17 SOCIAL EFFECTS ASSESSMENT	
The EIS will summarize the social effects based on the methodology described in Section 8 of these EIS Guidelines.	Requested addition: *In describing the socio-economic environment, the proponent must provide information on the functioning and health of the socio-economic environment, encompassing a broad range of matters that affect the people and communities in the study area in a way that recognizes interrelationships, system functions and vulnerabilities. A description of the rural and urban settings likely to be affected by the project should be provided.*[76] *In considering the local social and economic effects of the Project, the Proponent shall have due regard for the attitudes, beliefs and perceptions of local residents, and how these are*

[76] CEAA. 2011. Guidelines for the Preparation of an Environmental Impact Statement for the Comprehensive Study Process Pursuant to the *Canadian Environmental Assessment Act*, at p.17.

	grounded in their culture, social organizations and historical experience.[77]
Technical data will inform the social effects assessment. The interests of Aboriginal groups will be presented in the EIS in accordance with Section 15 and Section 20 of these EIS Guidelines. Where Aboriginal groups have identified interests in a VC, BC Hydro will incorporate additional baseline information as made available.	See General Comments – Aboriginal Traditional Knowledge See General Comments – Aboriginal Rights
17.1 Valued Component Scoping and Rationale	
Social considerations include potential adverse effects of the Project on the workforce, on local population, housing and community services, including health, emergency, education and transportation. Table 17.1 outlines the rationale for the selection of social VCs.	

[77] Government of Canada and Government of Newfoundland and Labrador. July 2008.Environmental Impact Statement Guidelines: Lower Churchill Hydroelectric Generation Project Newfoundland and Labrador Hydro, at p.34.

Table 17.1 Social valued components rationale	See General Comments – Valued Components
17.2 Population and Demographics	
17.2.1 Population and Demographics Spatial Boundaries	
The LAA and RAA are described in Table 17.2.	
Table 17.2 Population and demographics assessment areas	See General Comments – Spatial Boundaries
17.2.2 Population and Demographics Temporal Boundaries	
The EIS will describe the temporal boundaries, which will reflect the methodology described in Section 8 of these EIS Guidelines.	
17.2.3 Population and Demographics Baseline	
The EIS will present an overview of current baseline and forecast population and demographic characteristics within the LAA, using the following key indicators:	
• Population numbers (gender, age profile, labour force participation)	
• Household number and demographic characteristics, including marital status and dependents	
Information sources will include published studies and statistics, and information made available to BC Hydro from local, regional and provincial organizations and governments. Information sources will include historic and most currently available census data and population	

forecasts.	
17.2.4 Potential Effects of the Project and Proposed Mitigation	
The EIS will assess how the Project has the potential to adversely affect population and demographics.	
The potential to adversely affect population and demograhics will be assessed by taking into account the potential for the Project to result in changes to the following key aspects:	Requested amendment: *The potential to adversely affect population and demograhics will be assessed by taking into account the potential for the Project to result in temporary or permanent changes to the following key aspects…*
• The Peace River Regional District population, with specific reference to the City of Fort St. John	
• The results of the assessment of the Project on the labour market will be used to assess the effects on population and demographics	
Should potential adverse effects be identified, the potential mitigation measures will be identified and will include a description of how the mitigation measures can address the potential adverse effects.	
The EIS will describe project residual effects, and cumulative effects, if applicable, using the residual effects characterization described in Table 8.3. A statement of significance will be provided.	
17.2.5 Summary of Residual Effects on Population and Demographics	
The EIS will summarize the residual effects in a table format as shown in Table 8.4.	

17.3 Housing	
17.3.1 Housing Spatial Boundaries	
The LAA and RAA are described in Table 17.3.	
Table 17.3 Housing assessment areas	See General Comments – Spatial Boundaries
17.3.2 Housing Temporal Boundaries	
The EIS will describe the temporal boundaries, which will reflect the methodology described in Section 8 of these EIS Guidelines.	
17.3.3 Housing Baseline	
The EIS will describe housing baseline conditions within the LAA, using the following key indicators:	
• Occupancy and vacancy rates	
• Occupancy costs	
• Multiple Listing Service activity (BC Stats 2011c)	
• Residential construction activity	
• Planned housing developments	
• Land zoned and available for housing development	
Information sources will include published studies and statistics, and information made available to BC Hydro from the private sector, local, regional and provincial organizations and governments.	

17.3.4 Potential Effects of the Project and Proposed Mitigation	
The EIS will assess how the Project has the potential to adversely affect housing.	
The potential to adversely affect housing will be assessed by taking into account the potential for the Project to result in changes to the following key aspects:	
• The demand for housing, with specific reference to the City of Fort St. John	
• The assessment of the Project on the labour market and on Population and Demographics will be used to assess the effects on housing	
• Specific plans by BC Hydro to directly provide worker accommodation	
Should potential adverse effects be identified, the potential mitigation measures will be identified and will include a description of how the mitigation measures can address the potential adverse effects.	
The EIS will describe project residual effects, and cumulative effects, if applicable, using the residual effects characterization described in Table 8.3. A statement of significance will be provided.	
17.3.5 Summary of Residual Effects on Housing	
The EIS will summarize the residual effects in a table format as shown in Table 8.4.	

17.4 Community Infrastructure and Services	
17.4.1 Community Infrastructure and Services Spatial Boundaries	
The LAA and RAA are described in Table 17.4.	
Table 17.4 Community infrastructure and services assessment areas	See General Comments – Spatial Boundaries
17.4.2 Community Infrastructure and Services Temporal Boundaries	
The EIS will describe the temporal boundaries, which will reflect the methodology described in Section 8 of these EIS Guidelines.	
17.4.3 Community Infrastructure and Services Baseline	
The EIS will describe the capacity, statistics of, and approved plans for community infrastructure and services, using the following key indicators:	
• Community Services – recreation and leisure facilities, sewer and water services	
• Emergency Services – police, court, fire protection, ambulance services and provincial emergency planning	
• Education Services – public schools, private schools, post-secondary institutions	
• Health and Social Services – vital statistics, medical service expenditures, medical and dental facilities, practitioner numbers and services	

Information sources will include published studies and statistics, and information made available to BC Hydro from the private sector, local, regional and provincial organizations and governments.	
17.4.4 Potential Effects of the Project and Proposed Mitigation	
The EIS will assess how the Project has the potential to adversely affect community infrastructure and services.	
The potential to adversely affect community infrastructure and services will be assessed by taking into account the potential for the Project to result in changes to the following key aspects:	
• The demand for or provision of community, emergency, education, and health and social services and facilities	
• Specific displacement or effects to infrastructure, such as sewer and water systems	
• The results of the assessment of the Project on population and demographics will be used to assess the effects on community infrastructure and services	
Should potential adverse effects be identified, the potential mitigation measures will be identified and will include a description of how the mitigation measures can address the potential adverse effects.	
The EIS will describe project residual effects, and cumulative effects, if applicable, using the residual effects characterization described in Table 8.3. A statement of significance will be provided.	

17.4.5 Summary of Residual Effects on Community Infrastructure and Services	
The EIS will summarize the residual effects in a table format as shown in Table 8.4.	
17.5 Transportation	
17.5.1 Transportation Spatial Boundaries	
The LAA and RAA are described in Table 17.5.	
Table 17.5 Transportation assessment areas	See General Comments – Spatial Boundaries
17.5.2 Transportation Temporal Boundaries	
The EIS will describe the temporal boundaries, which will reflect the methodology described in Section 8 of these EIS Guidelines.	
17.5.3 Transportation Baseline	
The EIS will describe current road and rail transportation conditions, using the following key indicators:	
• Road traffic volumes	
• Road traffic counts	
• Road accident rates	
• Regional Road restrictions	
• Rail movements	
Information sources will include published studies and statistics, and information made available to BC Hydro from the private sector, local, regional and provincial	

organizations and governments, as well as traffic counts conducted by BC Hydro.	
17.5.4 Potential Effects of the Project and Proposed Mitigation	
The EIS will assess how the Project has the potential to adversely affect transportation.	
The potential to adversely affect transportation will be assessed by taking into account the potential for the Project to result in changes to the following key aspects:	
• Road and rail transportation in the LAA	
• The need to develop and use regional road and rail transportation routes for the movement of equipment, materials and people	
• Specific transportation plans proposed by BC Hydro	
• Local road and rail traffic forecasts of vehicle and rail movements, with specific reference to intersections near the City of Fort St. John, and to specific rail sidings and yards	
• The results of the assessment of the Project on population and demographics, the workforce accommodation plan, and assumptions about workforce shift schedules during construction will be used to assess the effects on transportation	
Should potential adverse effects be identified, the potential mitigation measures will be identified and will include a description of how the mitigation measures can address the potential adverse effects.	
The EIS will describe project residual effects, and cumulative effects, if applicable, using the residual effects characterization described in Table 8.3. A statement of	

significance will be provided.	
17.5.5 Summary of Residual Effects on Transportation	
The EIS will summarize the residual effects in a table format as shown in Table 8.4.	
17.6 References	
This subsection will include a list of all supporting references used in the social sections of the EIS.	
18 HERITAGE RESOURCES EFFECTS ASSESSMENT	
The EIS will summarize the potential adverse effects of the Project on heritage resources, including physical and cultural heritage resources, and any structure, site or thing that is of historical, archaeological, palaeontological or architectural significance.	
Technical data will inform the effects assessment on heritage resources. The interests of Aboriginal groups will be presented in the EIS in accordance with Section 15 and Section 20 of these EIS Guidelines. Where Aboriginal groups have identified interests in a VC, BC Hydro will incorporate additional baseline information as made available.	See General Comments – Aboriginal Traditional Knowledge See General Comments – Aboriginal Rights
18.1 Valued Component Scoping and Rationale	
The heritage resource VC includes paleontological, historical and archaeological sites, and the rationale for its selection is described in Table 18.1. The selected VC for heritage resources has an identified interaction with the	The nature, scope and extent of “heritage resources” must be broad and encompass the various social, economic, political, environmental and cultural dimensions included in the Agency’s definition of

Project and there is a legal requirement to address potential adverse effects on heritage resources.	"heritage".[78] Requested amendments: *The heritage resource VC includes paleontological, historical and archaeological sites, <u>both tangible and intangible heritage resources,</u> and the rationale for its selection is described in Table 18.1.* *<u>"Tangible" heritage resources may be a site, and include cultural landscapes and landscape features, movable and immovable resources, and resources that are in water</u>.*[79] *"Intangible" 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.*[80]

[78] Canadian Environmental Assessment Agency, *Reference Guide on Physical and Cultural Heritage Resources*, http://www.ceaa.gc.ca/default.asp?lang=En&n=1BE75513-1&offset=1&toc=show accessed March 12, 2012.

[79] Ibid.

[80] UNESCO. 2003, Convention for the Safeguarding of the Intangible Cultural Heritage: Basic Texts, at p. 9.

Table 18.1 Heritage resources valued component rationale	See General Comments – Valued Components
18.2 Heritage Resources	
18.2.1 Heritage Resources Spatial Boundaries	
The LAA and RAA are described in Table 18.2.	
Table 18.2 Heritage resources assessment areas	See General Comments – Spatial Boundaries
18.2.2 Heritage Resources Temporal Boundaries	
The EIS will describe the temporal boundaries, which will reflect the methodology described in Section 8 of these EIS Guidelines.	
18.2.3 Heritage Resources Baseline	
The EIS will describe location and nature of known heritage resources within the LAA.	
Baseline data will be acquired through literature reviews of published and unpublished records, interviews with stakeholders, and inventory field work. Interviews and	Requested additions: [81] • *aboriginal communities;* • *academic and research institutions;*

[81] Canadian Environmental Assessment Agency, *Reference Guide on Physical and Cultural Heritage Resources*, http://www.ceaa.gc.ca/default.asp?lang=En&n=1BE75513-1&offset=1&toc=show accessed March 12, 2012.

literature reviews will identify cultural heritage resources following the Reference Guide on Physical and Cultural Heritage Resources (Agency 1996). Archaeological and historical site inventory field work will include surface and subsurface inspections, completed in accordance with British Columbia Archaeological Impact Assessment Guidelines (BCMNRO1998:13) and permits issued under the *Heritage Conservation Act*. Paleontological field work will include surface inspections and specimen collection, completed in accordance with standard practice for the paleontological impact assessment, including development of a geologically based paleontological sensitivity map to guide field investigations.	• *professional societies and organizations;* • *land use plans; and* • *local citizens or associations involved in the area of heritage conservation and protection.*
The significance of archaeological and historical resources will be determined using criteria set out in the British Columbia Archaeological Impact Assessment Guidelines (BCMNRO 1998:13). Categories of significance include scientific, public, ethnic, historic and economic. The developing BC Fossil Management Framework (BCMNRO 2010) will guide the significance evaluation of paleontological resources.	
18.2.4 Potential Effects of the Project and Proposed Mitigation	
The EIS will assess how the Project has the potential to adversely affect heritage resources.	
The potential to adversely affect heritage resources will be assessed by taking into account the potential for the Project to result in changes to the following key aspects:	
• Disturbing heritage sites and features	
• Disturbing artifacts, features, human remains and fossils	
• Hindering or increasing access to sites and	

destroying contextual information (Davis et al. 2004; Williams and Corfield 2003)	
Should potential adverse effects be identified, the potential mitigation measures will be identified and will include a description of how the mitigation measures can address the potential adverse effects.	
The EIS will describe project residual effects, and cumulative effects, if applicable, using the residual effects characterization described in Table 8.3. A statement of significance will be provided.	
18.2.5 Summary of Residual Effects on Heritage Resources	
The EIS will summarize the residual effects in a table format as shown in Table 8.4.	
18.3 References	
This subsection will include a list of supporting references used in this section of the EIS.	
19 HEALTH EFFECTS ASSESSMENT	
The EIS will summarize the human health effects based on the methodology described in Section 8 of these EIS	Requested addition: *In describing the socio-economic environment, the proponent*

Guidelines.	*must provide information on the functioning and health of the socio-economic environment, encompassing a broad range of matters that affect the people and communities in the study area in a way that recognizes interrelationships, system functions and vulnerabilities. A description of the rural and urban settings likely to be affected by the project should be provided.*[82] *In considering the local social and economic effects of the Project, the Proponent shall have due regard for the attitudes, beliefs and perceptions of local residents, and how these are grounded in their culture, social organizations and historical experience.*[83] The collective economic, social, and health assessment proposed in the Draft EIS Guidelines falls somewhat short of the "determinants of health" approach to impact assessment developed by Health Canada.[84]This approach involves consideration of the following factors: • Income and Social Status • Education • Employment and Working Conditions • Physical Environments

[82] CEAA. 2011. Guidelines for the Preparation of an Environmental Impact Statement for the Comprehensive Study Process Pursuant to the *Canadian Environmental Assessment Act*, at p.17.

[83] Government of Canada and Government of Newfoundland and Labrador. July 2008.Environmental Impact Statement Guidelines: Lower Churchill Hydroelectric Generation Project Newfoundland and Labrador Hydro, at p.34.

[84] Health Canada. 2004. Canadian Handbook on Health Impact Assessment: The Basics.

	• Biology and Genetic Endowment • Personal Health Practices and Coping Skills • Social Support Networks • Healthy child development • Health Services While several of these factors are addressed in the Draft EIS Guidelines, the focus appears to be on physical health rather than the broader factors that determine community health. There also is no framework identified for the consideration of the effects of the proposed Project on community health. Requested addition: *The EIS shall identify, describe and justify the framework used in the health effects assessment, including commenting on the suitability of the proposed framework for the development setting drawing on examples where the framework has been used in the assessment of similar projects.*
Technical data will inform the effects assessment on human health. The interests of Aboriginal groups will be presented in the EIS in accordance with Section 15 and Section 20 of these EIS Guidelines. Where Aboriginal groups have identified interests in a VC, BC Hydro will incorporate additional baseline information as made available.	See General Comments – Aboriginal Traditional Knowledge See General Comments – Aboriginal Rights
19.1 Valued Component Scoping and Rationale	
The health VC and rationale for its selection is described in Table 19.1. The selected VC is based on health values with potential interaction with the Project, regulatory requirements, and heath assessment guidelines (e.g., HC 2004, HC 2010, HC 2011).	

Table 19.1 Human health valued component rationale	See General Comments – Valued Components
19.2 Human Health	
19.2.1 Human Health Spatial Boundaries	
The LAA and RAA are described in Table 19.2.	
Table 19.2 Human health assessment areas	See General Comments – Spatial Boundaries
19.2.2 Human Health Temporal Boundaries	
The EIS will describe the temporal boundaries, which will reflect the methodology described in Section 8 of these EIS Guidelines.	
19.2.3 Human Health Baseline	
The EIS will describe the current baseline data for human health indicators using information provided in technical data reports on air quality, water quality, noise, electric and magnetic fields, and methylmercury. The baseline data will include the identification of human health receptor locations.	
19.2.4 Potential Effects of the Project and Proposed Mitigation	
The EIS will assess how the Project has the potential to adversely affect human health.	
The potential to adversely affect human health will be assessed by taking into account the potential for the Project to result in changes to the following key aspects:	
• Ambient air quality	

• Potable and recreational water quality	
• Noise and vibration	
• Electric and magnetic fields	
• Methylmercury concentrations in fish consumed by humans	
Should potential adverse effects be identified, the potential mitigation measures will be identified and will include a description of how the mitigation measures can address the potential adverse effects.	
The EIS will describe project residual effects, and cumulative effects, if applicable, using the residual effects characterization described in Table 8.3. A statement of significance will be provided.	
19.2.5 Summary Residual Effects on Human Health	
The EIS will summarize the residual effects in table format as shown in Table 8.4.	
19.3 References	
This subsection will include a list of supporting references used in this section of the EIS.	
VOLUME 5 – ABORIGINAL INTERESTS AND INFORMATION, ENVIRONMENTAL MANAGEMENT PLANS, AND FEDERAL INFORMATION REQUIREMENTS	Request amendment: *Aboriginal Asserted Aboriginal Rights, established Treaty Rights and Interests and Information…*
20 ABORIGINAL INTERESTS AND INFORMATION REQUIREMENTS	Request amendment: Aboriginal Asserted Aboriginal Rights, established Treaty Rights and Interests and Information Requirements

The EIS will:	
• Identify the Aboriginal groups potentially affected by the project, with the guidance of the Governments of British Columbia and Canada, and provide background information about each group	
• Provide BC Hydro's understanding of the constitutionally recognized Aboriginal and treaty rights held by each potentially affected Aboriginal group	Requested amendment: • *Provide BC Hydro's understanding of the constitutionally recognized asserted Aboriginal and existing Treaty rights held by each potentially affected Aboriginal group*
• Provide BC Hydro's understanding of the components of the environment that are valued by each potentially affected Aboriginal group as lands and resources used for traditional purposes, including activities conducted in the exercise of Aboriginal or treaty rights, that may be affected by the project. This understanding will be guided by consultation and engagement with each Aboriginal group, guidance provided by provincial and federal government agencies, and by relevant studies and information.	An understanding of the effect of the Project on the exercise of asserted Aboriginal and existing Treaty rights will require a broader understanding, as First Nation understandings do not generally consider or value "components of the environment". Requested amendment: • *Provide BC Hydro's understanding of how the ~~components of the~~ environment ~~that are~~ is valued by each potentially affected Aboriginal group ~~as lands and resources used for traditional purposes, including~~ for activities conducted in the exercise of Aboriginal or Treaty rights, including lands and resources used for traditional purposes and the potential effects of the Project on those rights and uses.*
20.1 Aboriginal Groups	
BC Hydro must consult with the following Aboriginal groups with respect to the components of the environment that are valued by each as lands and resources used for traditional purposes, including activities conducted in the exercise of Aboriginal or treaty rights, and the potential effect of the Project on those uses:	Requested amendment: • *BC Hydro must consult with the following Aboriginal groups with respect to ~~the components of~~ how the environment ~~that are~~ is valued by each ~~as lands and resources used for traditional purposes, including~~ for activities conducted in the exercise of Aboriginal or Treaty rights, including as lands and resources used for traditional purposes and the potential effects of the*

	Project on those rights and uses:
[In the final version of the EIS Guidelines, the Minister of Environment of Canada and Executive Director of the BCEAO will identify the Aboriginal groups that BC Hydro must consult with and insert the list here]	

20.2 Aboriginal Groups Background Information	The CEAA Guidance document requires the following: *Description of the traditional territory and potential or established Aboriginal and Treaty rights that are exercised in relation to the assessment area".*[85] In order for the EIS to be of utility for understanding cumulative effects of the proposed Project on First Nations' Section 35(1) rights, a thorough description of the location, and extent of lands "taken up" by the Crown since the time of Treaty is also required. This necessitates a description of the traditional territory at a time of establishment of the flood reserve and initial planning for development of the hydroelectric potential on the Peace River in 1957. Requested additions to the list: • *Provide a historical description of the traditional territory of each of the potentially affected First Nations at or around 1957, showing the lands "taken up" for settlement, mining, transportation, trading, wildlife conservation, parks, etc;* • *Provide a current description of the traditional territory of each of the potentially affected First Nations, showing the lands "taken up" for settlement, mining, transportation, trading, wildlife conservation, parks, etc;* To date, BC Hydro and the T8FNs have been working with an understanding that the "traditional territory" for the purposes of the environmental assessment would be the regional study area for the traditional land use study being undertaken by the T8FNs.

[85] CEAA. 2011. Guidelines for the Preparation of an Environmental Impact Statement for the Comprehensive Study Process Pursuant to the *Canadian*

The EIS will:	
• Identify the Aboriginal groups whose interests are potentially affected by the Project. Maps will be included that show the location of communities of potentially affected Aboriginal groups in proximity to the Project	Requested amendment: • *Identify the Aboriginal groups whose asserted Aboriginal rights, established Treaty rights and interests are potentially affected by the Project. Maps will be included that show the location of communities of potentially affected Aboriginal groups in proximity to the Project*
• Provide background information for each potentially affected Aboriginal group identified in this section, to the extent that information is made available to BC Hydro by the Aboriginal groups, or that may be publicly available.	
20.3 Aboriginal and Treaty Rights	
The EIS will:	
• Identify current use of lands and resources by Aboriginal persons for traditional purposes, including activities conducted in the exercise of treaty rights or asserted Aboriginal rights, in the vicinity of the Project by members of the Aboriginal groups identified in Section 20, to the extent this information is made available to BC Hydro by the	Requested amendment: • *Identify past, current and future use of lands and resources by Aboriginal persons for the exercise of Treaty rights, including for traditional purposes, ~~including activities conducted in the exercise of treaty rights or asserted Aboriginal rights~~, in the vicinity of the Project by members of the Aboriginal groups identified in Section*

Environmental Assessment Act, at p.15.

First Nations, for example from traditional use studies, and from publicly available sources.	*20, to the extent this information is made available to BC Hydro by the First Nations, for example from traditional use studies, and from publicly available sources.*
• Assess potential adverse effects of the Project on the current use of lands and resources for traditional purposes, including activities conducted in the exercise of Treaty 8 rights and on activities conducted in the exercise of asserted Aboriginal rights, as described in Section 15.2.	Requested amendment: • *Assess potential adverse effects of the Project on the exercise of Treaty 8 rights and on activities conducted in the exercise of asserted Aboriginal rights, including on the past, current and future use of lands and resources for traditional purposes, ~~including activities conducted in the exercise of Treaty 8 rights and on activities conducted in the exercise of asserted Aboriginal rights~~, as described in Section 15.2.*
• Describe measures to avoid, reduce or otherwise mitigate potential adverse effects on traditional use of lands and resources for traditional purposes, on activities conducted in the exercise of treaty rights, and activities conducted in the exercise of any Aboriginal rights that may be asserted by the Aboriginal groups.	Requested amendment: • *Describe measures to avoid, reduce or otherwise mitigate potential adverse effects on activities conducted in the exercise of Treaty rights, and activities conducted in the exercise of any Aboriginal rights that may be asserted by the Aboriginal groups, including past, current and future ~~traditional~~ use of lands and resources for traditional purposes, ~~on activities conducted in the exercise of treaty rights, and activities conducted in the exercise of any Aboriginal rights that may be asserted by the Aboriginal groups~~.*
20.4 Other Interests of Aboriginal Groups	
The EIS will:	
• Identify interests that Aboriginal groups may have with respect to potential social, economic, health, and physical and cultural heritage effects of the Project	
• Describe how the potential effects on those interests have been accounted for in the assessment of the potential adverse effects of the	Requested amendment: • *Describe how the potential effects on those interests have been ~~accounted for~~ addressed in the assessment of*

Project on VCs or otherwise	*the potential adverse effects of the Project on VCs or otherwise*[86]
• Describe BC Hydro's approach to building capacity, for example opportunities for Aboriginal employment, contracting, and business development	As written, this sub-section is unlikely to result in a realistic understanding of "building capacity" in Aboriginal communities. Requested amendment: • *Describe BC Hydro's understanding of the challenges and opportunities to ~~approach to~~ building capacity in Aboriginal communities, including for example challenges related to Aboriginal education, training and transportation, and opportunities for Aboriginal employment, contracting, and business development*
20.5 Aboriginal Consultation and Engagement	
The EIS will:	
• Summarize project consultation and engagement undertaken prior to the acceptance of the Project Description Report, the issuance of these EIS Guidelines, and the submission of the EIS	
• Describe consultation and engagement methods, and opportunities provided to Aboriginal groups to identify rights, interests and concerns related to the Project	

[86] CEAA. 2011. Guidelines for the Preparation of an Environmental Impact Statement for the Comprehensive Study Process Pursuant to the *Canadian Environmental Assessment Act*, at p.2.

• Provide a plan for consultation with Aboriginal groups on the EIS	
20.6 Aboriginal Summary	
The EIS will provide a summary of the Aboriginal groups' interests potentially effected by, and concerns with respect to, the Project and will summarize BC Hydro's understanding of the potential adverse effects of the Project on those interests.	Requested amendment: *The EIS will provide a summary of the Aboriginal groups' asserted Aboriginal rights, established Treaty right and interests potentially effected by, and concerns with respect to, the Project and will summarize BC Hydro's understanding of the potential adverse effects of the Project on those rights and interests.* Requested addition: *At least sixty (60) days prior to the submission of the EIS, Aboriginal groups will be provided with a draft of the Aboriginal summary. If Aboriginal Groups do not agree with the conclusions of the Aboriginal summary, they may provide a separate submission to be included in the EIS.*
20.7 References	
This subsection will include a list of supporting references used in this section of the EIS.	

21 SUMMARY OF PROPOSED ENVIRONMENTAL MANAGEMENT PLANS	
The EIS will describe the framework for environmental management to be implemented during construction and operation to mitigate potential adverse effects. The framework will include:	
• BC Hydro environmental policies	

• Statutory requirements	
• Objectives and voluntary commitments	
• Relevant human resource plans	
• Environmental compliance monitoring	
• Mitigation and environmental protection measures	
• Contingency planning for accidents	
The framework, in the form of an annotated outline, will be presented in the EIS for each environment management plan (EMP). Annotated outlines will be provided for the following EMPs:	
Construction Safety Management Plans	
• Emergency Response Plan	
• Fire Hazard and Abatement Plan	
• Public Safety Management Plan	
• Worker Safety and Health Management Plan	
Construction Environmental Management Plans	
• Acid Rock Drainage Management Plan	
• Air Quality Management Plan	
• Archaeological and Heritage Resources Management Plan	
• Blasting Management Plan	
• Borrow and Quarry Sites Reclamation Plan	
• Communication Plan: Construction	
• Construction Waste Management Plan	

• Contaminated Sites Management Plan	
• Dust Control Plan	
• Environmental Training Management Plan	
• Erosion Prevention and Sediment Control Plan	
• Fisheries and Aquatic Habitat Management Plan	
• Groundwater Protection Plan	
• Hazardous Waste Management Plan	
• Ice Management Plan	
• Noise and Vibration Management Plan	
• Reservoir, Transmission Line and Road Clearing Plans	
• Soil Management, Site Restoration and Re-Vegetation Plan	
• Solid Waste Management Reduction and Recycling Plan	
• Surface Water Quality Protection Plan	
• Traffic Management Plan	
• Wildlife Management Plan	
• Vegetation and Invasive Plant Management Plan	
Operational Safety Management Plans	
• Emergency Response Plan	
• Public Safety Management Plan	
• Worker Safety and Health Management Plan	

Operational Environmental Management Plans	
• Hazardous Materials Management Plan	
• Ice Management Plan	
• Materials Management Plan	
• Vegetation Management Plan	
• Waste Management Plan	
• Water Management Plan	
21.1 References	
This subsection will include a list of supporting references used in this section of the EIS.	
22 COMPLIANCE REPORTING	
The EIS will describe the reporting structure as identified in the environmental management plans and conditions.	
22.1 References	
This subsection will include a list of supporting references used in this section of the EIS.	
23 REQUIREMENTS FOR THE FEDERAL ENVIRONMENTAL ASSESSMENT	
Federal requirements of the environmental assessment of the Project are addressed in various sections of these EIS Guidelines. Table 23.1 describes how the federal requirements will be addressed in the EIS.	

Table 23.1 Federal requirements effects assessment concordance table	
23.1 Effect of the Environment on the Project	
The EIS will identify the type, location, frequency and magnitude of environmental factors that may adversely affect the Project. The environmental factors that will be assessed are: extreme weather events; sedimentation of the reservoir; seismic activity; wildfire; flooding; slope stability and mass wasting events; and climate change.	
The EIS will identify changes and assess the potential adverse effects on the Project that may be caused by the above-mentioned environmental factors, evaluate the likelihood and severity of the changes or effects, and describe design strategies and management measures planned to mitigate the potential adverse effects of the Project.	
23.2 Potential Accidents and Malfunctions	
The EIS will identify potential accidents and malfunctions that could occur during the construction and operations phases. For example:	Requested addition: *The proponent must identify the probability of potential accidents and malfunctions related to the project, including an explanation of how those events were identified, potential consequences (including the environmental effects), the worst case scenarios and the effects of these scenarios.* *The geographical and temporal boundaries for the assessment of malfunctions and accidents may be different than those in the scope of factors for each VEC. This must include an identification of the magnitude of an accident and/or malfunction, including the quantity, mechanism, rate, form and characteristics of the contaminants and other materials likely to be released into the environment during the accident and malfunction events.*

	The EIS must also describe the safeguards that have been established to protect against such occurrences and the contingency/emergency response procedures in place if an accident and/or malfunction does occur.[87] The list appears to overlook the potential for an accident or malfunction at one of the existing upstream dams. Such an event, whether a dam break or a sudden change in operating conditions, could have severe consequences for the proposed Project. Requested addition (to both the construction and operations phases): • *An updated dam break study and an updated dam break model with inundation mapping for cascading dam failure scenarios involving the WAC Bennett Dam, Peace Canyon Dam, and proposed Site C Project.* • *An outline of integrated emergency planning for these scenarios;* • *A dam breach analysis for construction phase cofferdams; and* • *Estimates of economic losses from dam failure (i.e. not just residential dwellings).*[88]
Construction phase:	
• release or spill of chemicals or hazardous materials;	Requested addition:

[87] CEAA. 2011. Guidelines for the Preparation of an Environmental Impact Statement for the Comprehensive Study Process Pursuant to the *Canadian Environmental Assessment Act*, at p. 22-23.

[88] Lower Churchill Hydroelectric Project Joint Review Panel. 2010. Lower Churchill Hydroelectric Generation Project – Joint Review Panel Information Requests no. 4, IR# JRP.162 Dam Break.

containment pond leakage or failure; cofferdam failure; sediment control failure; fire and explosion.	• *… fire and explosion; and any other project components or systems that have the potential, through accident or malfunction, to adversely affect the environment.* [89]
Operations phase:	
• dam safety incidents; release or spill of chemicals or hazardous materials; fire and explosion.	Requested addition: • *… fire and explosion; and any other project components or systems that have the potential, through accident or malfunction, to adversely affect the environment.* [90]
The likelihood and circumstances under which these events could occur will be assessed along with the potential adverse effects that may result from such events.	Requested addition: *The EIS shall pay special attention to the sensitive elements of the environment (e.g., communities, homes, natural sites of interest, areas of major use) that may be affected in the event of an accident or malfunction.* [91]
The EIS will provide an overview of the measures that would be implemented to reduce the likelihood and those that could be implemented to mitigate the potential occurrence of an accident or malfunction.	Requested addition: *The EIS will provide an overview of the measures that would be implemented to reduce the likelihood and those that could be implemented to mitigate the potential occurrence of an*

[89] Government of Canada and Government of Newfoundland and Labrador. July 2008.Environmental Impact Statement Guidelines: Lower Churchill Hydroelectric Generation Project Newfoundland and Labrador Hydro, at p.34.

[90] Government of Canada and Government of Newfoundland and Labrador. July 2008.Environmental Impact Statement Guidelines: Lower Churchill Hydroelectric Generation Project Newfoundland and Labrador Hydro, at p.34.

[91] Government of Canada and Government of Newfoundland and Labrador. July 2008.Environmental Impact Statement Guidelines: Lower Churchill Hydroelectric Generation Project Newfoundland and Labrador Hydro, at p.34.

	accident or malfunction, including detailed contingency and response plans.[92]
23.3 Cumulative Environmental Effects	
The EIS will provide an assessment of the potential cumulative adverse effects that are likely to result from the Project in combination with other projects or activities that have been or will be carried out.	
23.4 Capacity of Renewable Resources	
The EIS will describe the type of renewable resources that may be significantly adversely affected by the Project.	
23.5 Consideration of the Need for, and Requirements of, any Follow-up Program	
In each case where the environmental assessment demonstrates that the Project is likely to result in a residual adverse effect, the EIS will describe the consideration given to the need for, and the requirements of, any follow-up program, taking into account the following:	

[92] CEAA. 2011. Guidelines for the Preparation of an Environmental Impact Statement for the Comprehensive Study Process Pursuant to the *Canadian Environmental Assessment Act*, at p. 23.

• Whether, taking into account mitigation, the residual adverse effect would be significant	
• The feasibility and nature of any mitigation measures proposed by BC Hydro	
• Taking into account any mitigation measures proposed by BC Hydro, the level of confidence with which the assessment of the magnitude, extent, duration, frequency, and reversibility of the residual adverse effect have been assessed	
23.6 References	
This subsection will include a list of supporting references used in this section of the EIS.	
24 SUMMARY OF POTENTIAL RESIDUAL EFFECTS OF THE PROJECT	
The EIS will summarize each residual environmental, economic, social, heritage or health effect in a table format as shown below.	
Table 24.1 Summary of assessment of potential environmental effects	
25 TABLE OF CONDITIONS	
The EIS will provide a description of each condition that may be necessary to conclude that a potential adverse effect is either unlikely to result from the Project or unlikely to be significant.	
The EIS will present the conditions in table format as shown below.	

Table 25.1 Table of conditions	
26 CONCLUSION	
The EIS will provide the proponent's conclusion as to the potential benefits of the Project, whether the Project will result in a significant adverse effect and, if so, whether the Project can be justified in the circumstances.	
27 EIS GUIDELINES REFERENCES	
In preparing these EIS Guidelines, the following references were used:	
28 APPENDICES	
The EIS will include a series of technical data reports and other documentation used to support the content of the EIS.	