



Keeyask Generation Project Environmental Impact Statement

Responses to Information Requests -
CEC, Round 2



August 2013



2013 08 16

Clean Environment Commission
305-155 Carlton Street
Winnipeg, MB R3C 3H8

Attention: Mr. Terry Sargeant, Commission Chair

Dear Mr. Sargeant:

**Re: KEEYASK GENERATION PROJECT - RESPONSES TO SECOND ROUND OF CEC
INFORMATION REQUESTS FROM HEARING PARTICIPANTS**

The Keeyask Hydropower Limited Partnership submitted the Keeyask Generation Project Environmental Impact Statement (EIS) on July 6, 2012. On November 14, 2012, the Minister of Conservation and Water Stewardship asked the Clean Environment Commission (CEC) to hold public hearings for the Keeyask Generation Project (the Project). Subsequent to this announcement, the Minister (based on recommendations from the CEC) approved the formal, funded involvement of seven Hearing Participants, representing various community groups and organizations interested in the Project.

As part of this hearings process, the CEC provides all Hearing Participants the opportunity to ask the Partnership Information Requests to provide further clarity on the Partnership's EIS Filing. The first round of Information Requests was provided to the Partnership on May 31, 2013; the Partnership responded to these requests on July 15, 2013.

The Hearing Participants were then provided the opportunity to ask the Partnership a second round of Information Requests. These requests were limited to follow-up questions only and were submitted to the Partnership on July 31, 2013; the Partnership had until August 16, 2013 to respond.

The Partnership is pleased to provide its responses to this second round of Information Requests in the attached binder titled *Responses to Information Requests - CEC, Round 2*. The contents of this binder are also available on the Partnership's Website at <http://www.keeask.com>.

Should you have any questions or require additional assistance, please feel free to contact Vicky Cole at 204 360-4621.

Yours truly,

5900345 Manitoba Ltd.
as general partner of the
Keyask Hydropower Limited Partnership



K.R.F. Adams, P. Eng
President

KRFA/
Enclosure

c: Ms. Tracey Braun

Department	Volume / Document	Line Number / Table Number / Figure Number	Page	Topic	Context / Preamble e.g., provide applicable background/rationale for providing the comment	Specific Department Comment / Request for Additional Information:	Round 1 Proponent Response	Round 2 Intervenor Question	Round 2 Response #	original intervenor IR#
Consumers Association of Canada										
	R-EIS Guidelines	C. 6, C. 7-3 and 7-45	425, 426, 488	Response to EIS Guidelines	The project identified valued environmental components (VECs) and then analyzed the adverse residual affects of the project on the VECs, taking into consideration mitigation efforts. Then they determined the significance of the adverse effects based on guidance from regulatory authorities which the project admitted differs from Cree World Views. (C. 7-3)	How would the results vary if a Cree World View was used as the benchmark?	CAC-0075a	The Project was evaluated by each of the KCNs in terms of their own worldview, values and experience with past hydroelectric development, as well as their relationships with Mother Earth (see Chapter 2 and the KCNs' Environmental Evaluation Reports which were provided to assist others in understanding their independent decisions to be Project proponents). (lines 21 through 26, emphasis added) In Chapter 2.4.7, the Partnership describes how referendum were implemented and a majority of participants supported joining the project. Does a referendum imply local worldview, values and experiences were integrated into decision making? In other words, is a referendum able to encompass these features, or is it a Western system that assigns equal weight to each individual and find that majority support is the test? Please explain.	CEC Rd 2 CAC-0111	CAC-IR Round 2-1
CAC	R-EIS Guidelines	C. 7-3 and 7-45	N/A	Socio-Economy	The project has identified socio-economic cumulative affects and concluded that this project will not worsen them. (C.7-45)	Given that these cumulative affects have been very troublesome, is it sufficient to not create more damage to justify the project? What ethical principle is being used to make this decision, e.g. Pareto optimality?	CAC-0075b	To paraphrase, the question was, given the troublesome impacts on FN communities from hydro dams in the past, what ethical criteria was used to make the difficult decision about the Keeyask project? In its response, the Partnership indicates that: KCNs Members interviewed in the video are explicit that, while the decision in weighing potential adverse effects against the potential benefits was a difficult one, the decision to support the Project was based on a belief that the future will be better with the Project than without – that there will be a benefit to future generations. (emphasis added) • Acknowledging the referendum results, what if any mechanisms does the Partnership have in place to evaluate the will of the communities as the project proceeds? What if any mechanisms does the Partnership have in place to respond to the possibility that the percentage of those opposed to the project will surpass the percentage in favour as the project moves from plan through construction to operations? • Acknowledging the referendum results, does the Partnership accept that if the negative effects are larger than expected and the local positive impacts are much weaker than expected, the analytic basis on which the project went ahead would then shatter? • Recognizing the risks that the current level of support may diminish, that the negative impacts are much larger than expected and that the positive impacts are much weaker, what risk matrix or ethical framework did the KCN communities employ to determine that the benefits of going ahead outweighed the risks?	CEC Rd 2 CAC-0112	CAC-IR Round 2-2
						How will higher waged/higher skilled jobs be created for Keeyask members? How will Keeyask Cree Nations (KCN) residents gain skills to take on these jobs?	CAC-0076a	The response is helpful but I am still not clear on the likely impact regarding construction employment. • Given that KCN workers will be competing with workers from the South with more skills and experience is it likely that they will gain higher waged and higher skilled jobs in the construction phase? • If the answer to the question above is yes, please provide any evidence from past Hydro projects or from the literature to justify your expectation that KCN workers will be likely to gain higher waged and higher skilled jobs in the construction phase.	CEC Rd 2 CAC-0113	CAC-IR Round 2-3
						How will KCN residents get training and education needed to get other permanent jobs?	CAC-0076b	Thank-you for the response. Once again you describe a plan for training and education. Please provide any evidence from past Hydro projects or from the literature to justify your expectation that the plan for training and education works with FN communities?	CEC Rd 2 CAC-0114	CAC-IR Round 2-4
CAC	R-EIS Guidelines	6.6.3.1 employment, 6.6.3.1.1 construction, 6.6.3.2, business opportunities, 6.6.3.3, income	N/A	Socio-Economy	Sections 6.6. addresses a variety of subjects including economy, employment, business opportunities and income. While some details are provided further information	How many permanent positions in Keeyask operations will be taken on by KCN residents?	CAC-0076c	The question posed sought to determine how many permanent positions in Keeyask operations will be taken on by KCN residents? The Partnership's response indicated that .. it is reasonable to anticipate that some Keeyask Generation operation and maintenance jobs will be filled by KCNs Members. No estimate of this number was provided in the EIS as the 182 permanent positions in the JKDA for KCNs Members on Manitoba Hydro operation and maintenance jobs extend across Manitoba Hydro's system and are not confined to the Keeyask Project. Furthermore, it is not feasible to ascertain the exact number of Keeyask positions to be filled by KCNs Members as this number is dependent upon a variety of factors such as career aspirations, readiness and job opportunities. However, it is arguable that a mutual advantage might inure in that the KCN worker would know his/her community and environment very well which would benefit the project. Working in the locale would assist the KCN community as the worker would be more likely to be linked into the local economy. Local employment would reduce the 'brain drain' effect where the best workers leave the community which reduces the community's capacity. Given the potential for mutual advantage, why is a target not set?	CEC Rd 2 CAC-0115	CAC-IR Round 2-5
						In the longer term, 182 jobs for KCN residents will be created for Manitoba Hydro employment. Why 182 jobs as compared to some other figure? What if any implications does the employment of these members have on internal community capacity? Please discuss the suggestion that this might create a 'brain drain' on the KCN communities by encouraging these better trained employees to leave their community and move on to more lucrative opportunities elsewhere?	CAC-0076d	Line 21 refers to working groups made up of KCN members and Manitoba Hydro staff seeking ways to integrate 182 KCN workers into Manitoba Hydro operations. • Please provide more detail about how the working groups will achieve the 182 job target. • Also, at what point in time will the 182 be put in place: at the beginning of the 20 year period? At the end of the period?	CEC Rd 2 CAC-0116	CAC-IR Round 2-6
						How is it ensured that the KCN will get the lucrative contracts that are to be publicly tendered? Regarding the KCN businesses that are established during the construction phase, what will be done to ensure that they are sustainable into the future?	CAC-0077a	• Please share contract codes to be publicly tendered. • Also, line 31 makes reference to joint ventures between KCN businesses and non-KCN businesses. Please describe the non-KCN businesses: are they from the South? Are they large construction companies? Where are they based? How can it be assured that the KCN businesses benefit, and are not sidelined through the joint ventures? Please provide any evidence from past projects or the literature that joint ventures can work effectively for the FN community business?	CEC Rd 2 CAC-0117	CAC-IR Round 2-7

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CAC	R-EIS Guidelines	C.6.6, Chapter 9-9	N/A	Socio-Economy	Sections 6.6. addresses a variety of subjects including economy, employment and training opportunities and business development opportunities. In Chapter 9, Manitoba Hydro indicates that "the project is designed to . . . maximize economic and social benefits for the community." Additional information is requested on the following matters:	As KCN businesses are established please describe the mechanisms to ensure that they build management capacity, and accumulate capital?	CAC-0077b	77b. Re line 42-44, "Ultimately, how the communities choose to manage their businesses and related financial decisions about revenues is their decision." 77c. Re line 20-22: "The extent to which these opportunities will ultimately translate into LT community economic development will vary based on the established governance and community development processes in each of the KCN communities."	CEC Rd 2 CAC-0118	CAC-IR Round 2-8
						How will business development enforce a virtuous community economic development cycle whereby surpluses are reinvested locally?	CAC-0077c	• These two points seem to place the burden on the KCN communities to achieve success. But the Keeyask project is a partnership with Manitoba Hydro as a partner with the communities. • Does Manitoba Hydro not bear any responsibility for the success of KCN business ventures and or the long term development in the KCN's? If not, what does that say about the partnership?		
CAC	R-EIS Guidelines	C. 6.6, § 6.6.5.2	N/A	Socio-Economy	Chapter 6.6 discusses a variety of activities expected to develop local businesses and improve employment opportunities. As businesses grow and employment opportunities improve, local tax revenue will increase.	Please elaborate on how associated plans for local governments (e.g., band councils) to increase their capacity to manage and effectively utilize these funds?	CAC-0078	Re line 40: "...it is anticipated that these communities will be able to respond to the additional..." Please provide evidence from past projects or evidence from the literature to support your conclusion.	CEC Rd 2 CAC-0119	CAC-IR Round 2-9
CAC	R-EIS Guidelines	C. 6.6 socio economic environment, C. 8 Monitoring and Follow-up, 5.8.2.4,	p. 8-27, table 5, p. 8-28-8-33	Response to EIS Guidelines	Funds will be made available for the offsetting programs.	Please elaborate on the mechanisms in place to ensure that these funds will be used for these program and done so efficiently and effectively?	CAC-0079a	Re line 34: "...this Annual Program Budget is to be provided to Manitoba Hydro..." The issues of accountability regarding the offset programs is very important. The response above suggests that the KCN's are primarily accountable to Manitoba Hydro for the offset program funds. Could this upward accountability cause some problems vis-à-vis community impact? The literature on foreign aid finds that accountability to external donors can reduce the state's accountability to its citizens. Can you explain how this problem can be addressed?	CEC Rd 2 CAC-0120	CAC-IR Round 2-10
						In terms of the offsetting programs themselves, please elaborate on the organization that will be put in place and whether it will be one organization or whether each community will create their own.	CAC-0079b	Re line 14: "Each of the FNs will have considerable autonomy in establishing their own internal processes related to program implementation..." • Given the importance of the offset programs is it not important to have organizations established immediately upon receiving permission to begin construction? If that is the case is it not important for the KCN's to have already deliberated on an organizational structure? Also, if Keeyask is a partnership would it not make sense for Manitoba Hydro to establish a department of community development to maintain ongoing relations with the KCN's? • Does Manitoba Hydro have practical experience or literature to draw from to demonstrate the offset programs, like the ones proposed, work? If so, please provide this information. Will the costs be effectively covered by the offset supports in the face of inflation? Will this funding be protected in the future –5 years and 10 years—from changing views at Manitoba Hydro? If so, how?	CEC Rd 2 CAC-0121	CAC-IR Round 2-11
						Please elaborate on the ongoing monitoring and evaluation of all Keeyask programs –construction, operations, offsetting program—to ensure that programs are effective and meeting community interests? Please elaborate on the mechanism for adjustment if negative results are identified from the monitoring.	CAC-0079d	Please describe the training that members of the KCN will receive prior to undertaking monitoring and evaluation?	CEC Rd 2 CAC-0122	CAC-IR Round 2-12
CAC	R-EIS Guidelines	6.6.5.2 Community Health, 6.6.4.2, Housing	N/A	Socio-Economy		KCN notes that there is a housing crisis in their communities. Please elaborate on how the project will assist in addressing this crisis.	CAC-0081a	If the KCN's do not earn income from their partnership –or possibly lose money –the resultant lower revenues may lead to deterioration in housing as well as other features of their socioeconomic. Please indicate whether there is any risk in any specific year that the KCN Nations might not earn income from the partnership or indeed might have to make contributions from other revenues to the partnership. Are there any options open to the KCN Nations in which they can mitigate the risks associated with diminished or lost revenues?	CEC Rd 2 CAC-0123	CAC-IR Round 2-13
CAC	R-EIS Guidelines	C. 9, 9.2.3.1.1	9-2	Socio-Economy		There are many asymmetries in this project. How will it be ensured that these asymmetries do not lead to dominance of one group's interests over another groups? For instance, KCN communities are tiny in comparison to Manitoba Hydro and even regarding ownership shares, this imbalance holds. How can it be ensured that KCN communities have a fair voice in ongoing management of the project?	CAC-0084a	Thank-you for your helpful response. The organization you describe can certainly assist in fostering some level of participation by the KCN members in ongoing operations of the project. Manitoba Hydro and the KCN have goals in common. They both want the project to be implemented and run efficiently. However, their goals will inevitably diverge on some issues from time to time. There is literature on the dispute resolution system in large bodies such as the World Trade Organization that finds that large states' interests are more effectively protected relative to small states. This is because the large states have more resources for experts and lawyers. • What will prevent this type of outcome in the face of conflicts between Manitoba Hydro and the KCN's? • When there are conflicts of interest, can you explain how actors' interests can be identified and disputes can be resolved in a way that is mutually beneficial.	CEC Rd 2 CAC-0124	CAC-IR Round 2-14
						Within KCN communities some people did not support the project. How will their interests be protected as the project is implemented?	CAC-0084b	If the Keeyask project goes ahead, Manitoba Hydro's influence on the regional economy will be materially increased and Hydro will become a major actor in this region's economy. Does Manitoba Hydro acknowledge that it carries an ethical burden to ensure it is not harming the local communities and, hopefully, helping them?	CEC Rd 2 CAC-0125	CAC-IR Round 2-15
						"In contrast to the past, the Project puts into practice the proposition of greater empowerment of local indigenous people." It is claimed that the project will empower KCN communities. How does KHL define empowerment? How does it expect that the project will lead to empowerment? Chapter 9, section 9.2.1, page 9-2.	CAC-0084c	Defining empowerment as enabling one or more persons to do something is helpful. One presumes the definition also encompasses a pre-eminent role for the persons in identifying the task to be done along with enablement in developing the capacity to achieve the task. Please provide the literature or evidence from past experience demonstrating that the community development aspects of the Keeyask project are effective?	CEC Rd 2 CAC-0126	CAC-IR Round 2-16

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CAC	R-EIS Guidelines	6.6.5.6	6-488	Socio-Economy		Given the project has stated that it will cause 'sorrow' to the communities regarding culture and spiritual issues, what ethical framework was used to weigh this against the benefits?	CAC-0085	With regard to the "ethical framework" used to weigh cultural and spiritual adverse residual effects (as well as other adverse residual effects) against benefits of the Project, the KCN applied their own world view (and therefore their own ethical framework) in assessing the project. See response to CEC Rd 1 CAC-0075b. If a community assesses a new project does it necessarily utilize its worldview, values and experience? Or, faced with a 'foreign' idea (i.e., a dam) and a 'foreign' process (i.e., environmental impact assessment), is it possible that it utilizes 'other' worldviews, values, and experiences? • Can you explain how the Environmental Impact Assessments and referendum undertaken by the KCN necessarily mean that they used their worldview, values and experiences?	CEC Rd 2 CAC-0127	CAC-IR Round 2-17
CAC	SEE-RU-HR SV	3.12	N/A	Socio-Economy		Is there a literature indicating that the type of preferential treatment being used by the project for First Nation-owned businesses is effective? If so, please provide any literature in the possession of the partnership evaluating the success.	CAC-0086	The decision to engage in business relationships with First Nations-owned businesses was not based on literature, but rather on experience gained through past projects. Implementing Manitoba Hydro's Northern Purchasing Policy and Direct Negotiation Contracts (DNC) on Wuskwatim, on various transmission lines and other projects throughout Manitoba has yielded successful results for both the project and First Nations-owned businesses. As stated in the Joint Keeyask Development Agreement (JKDA), an objective of the Partnership is to expand the number, capacity, diversity and viability of KCNs Businesses. DNCs and the Northern Purchasing Policy are proven methods of achieving these Partnership objectives. • Please provide any independent evaluations of Manitoba Hydro's Northern Purchasing Policy and Direct Negotiation Contracts (DNC) on Wuskwatim demonstrating successful results for both the project and First Nations-owned businesses. • Please provide any commentary from KCN regarding Manitoba Hydro's Northern Purchasing Policy and Direct Negotiation Contracts (DNC) on Wuskwatim demonstrating successful results for both the project and First Nations-owned businesses. • Please provide the empirical evidence relied upon by Hydro to demonstrate that DNCs and the Northern Purchasing Policy are proven methods of achieving these Partnership objectives. • Please provide the criteria relied upon by Hydro to demonstrate that DNCs and the Northern Purchasing Policy are proven methods of achieving these Partnership objectives.	CEC Rd 2 CAC-0128	CAC-IR Round 2-18
CAC	N/A	6.2.3.2 Physical Environment, 6.5.8.2.1 Moose - Construction Effects and Mitigation (R to EIS); CNP Environmental Evaluation Report; FLCN Environmental Evaluation Report; 7.3.6.4 Moose, 7.4.6.3 Moose (TE SV); Results of Mammal, Reptile & Amphibian Investigations in the Keeyask Study Area 2002, 2003, 2004.	N/A	Terrestrial Environment	FLCN members point to the importance of willow, alder and hazel along current shorelines on Stephens Lake and Gull Lake as good moose feeding areas, all of which will be lost to flooding. TCN/WL members indicate that local veneer bogs, also set to be flooded, are used as important calving areas. CNP Members have indicated that veneer bogs (peatlands less than 1.5 m deep that generally occur on slopes) are occupied in wet seasons and are used as calving areas. FLCN members make mention of other key calving areas and in particular islands in both Stephens Lake and Gull Lake (of which 42% had moose present when surveyed in summer).	• Given the important role that specific shorelines, veneer bogs and islands play as prime moose habitat within the Local Study Area, please comment on the significance of their loss through Project construction and operation, and reconcile those comments with the finding in the EIS that because "peatlands are low quality habitat for moose, the predicted habitat composition trend for moose is likely to be neutral". • Similarly, please reconcile the environmental assessment of the KCNs, that point to declines in moose numbers sufficiently high to force their hunters to travel further afield, with the regulatory finding that the "effect on moose will likely be negligible to small".	CAC-0047	The statement in the EIS that "peat lands are low quality habitat for moose" stands irrespective of whether it is found in a section looking at changes expected with or without the Project. As such, to rephrase the question: • Do the Partners believe that peat lands in the Local Study Area to be of low, medium or high quality habitat? • How abundant are moose in the Local Study Area? What % of moose habitat in the Local Study Area will be adversely affected by the Project? Can you provide these figures for each of Zones 1, 2, 3 and 4?	CEC Rd 2 CAC-0129	CAC-IR Round 2-19
CAC	N/A	6.5.8.3 Beaver (R to EIS); YFFN Our Voices Evaluation Report; FLCN Environmental Evaluation Report; 7.3.6.2 Beaver and 7.4.6.1 Valued Environmental Components – Beaver (TE SV)	N/A	Terrestrial Environment	Moose rely on beaver for the creation of high quality habitat. According to technical science reports and KCN environmental assessments, a combination of shoreline changes, the seasonal reversal of water flow from system operations, flooding, changes in winter water levels and unpredictable ice conditions will all contribute to the direct mortality of beaver and/or impede individual home range reestablishment in the Local Study Area.	Given these predictions, please provide information on the expected impact that such declines in the local beaver population, as a keystone species, will have on local moose populations.	CAC-0048a	In Lines 18-20 of your response, the comment that the seasonal reversal of water flow from system operations is not a Project effect (rather it is something that was already altered by previous hydroelectric developments) would likely be challenged by KCNs who consider Keeyask to be the most recent stage of, what they consider to be, one large Hydro Project that began in the late 1950s. • When you say 10% of the beaver population is "expected to be affected", do you mean to say "killed"? If not, what does affected mean? • When you talk about colonies or lodges being "removed", what does that constitute? In removing colonies, are those animals killed directly or likely to die as a result of their removal? Or will they be relocated somewhere else? • Why wasn't the Local Study Area surveyed in its entirety in order to calculate beaver mortality in the LSA?	CEC Rd 2 CAC-0130	CAC-IR Round 2-20
						It is expected that between 20 to 30 active beaver colonies will be removed during clearing in Zone 1. While this is less than 10% of the estimated population in the Regional Study Area, what percentage does it constitute of the estimated population in the Local Study Area (Terrestrial Zones 1-4)? In terms of impact on the Local Study Area, would the effect of removing this many beaver colonies still be considered "small". If not, what would the predicted magnitude be?	CAC-0048b	• Is the removal of 18-36% of colonies in the Local Study Area akin to a mortality rate of 18-36% of beavers in the Local Study Area? (48b) • Please provide the derivation of this figure of 18-36% taking into account your statement that 59% of active lodges in the LSA will be removed? • Why is the removal (mortality?) rate in the LSA not given as 59% rather than the stated range of 18-36%? • It is mentioned that beavers "can replace [up to?] annual mortality of 30%, and can compensate for even greater losses through increased reproduction" (48a). Is that figure of 30% met through a single reproductive cycle? • Assuming this is dependent on the presence of beavers of a reproductive age, how is the beaver population in the Local Study Area expected to replace annual mortality (after removal of 59% of active lodges) and compensate for losses through increased reproduction?	CEC Rd 2 CAC-0131	CAC-IR Round 2-21
CAC	N/A	EIS Exec Sum; YFFN Environmental Evaluation Report; FLCN Environmental Evaluation Report; CNP Keeyask Environmental Evaluation Report; Appendix 9A (PE	N/A	Physical Environment	While the cycling of sediments and nutrients is essential to a healthy aquatic ecosystem, too much sediment and nutrient entering a waterway can have negative impacts on water quality and aquatic life. For the KCNs, the importance of water and water quality to local people is readily apparent. When the Executive Summary states that "water quality will always be suitable for aquatic life in the main part of the reservoir", this appears to contradict the KCN environmental evaluation reports that stress: (i) the impact that previous dam construction and reservoir impoundment have had on the declining quality and health of aquatic life in affected water bodies, with declines in water quality seen as a key cumulative impact/effect of hydro development in	In light of the observations and views of the KCNs, and an acknowledgement of uncertainty as to the magnitude of subsequent changes in sediments, nutrients, and metals, and decreases in dissolved oxygen, please provide information to support the validity of this statement on water quality and in doing so respond to the discrepancies apparent upon comparing the EIS technical science findings with the KCN environmental evaluation reports. What, for example, constitutes the "main part" of the reservoir and is water quality indeed expected to decline in Gull Lake and Stephens Lake to the point whereby aquatic life is negatively impacted? Not all organic sediment will be suspended in water bodies. Much will be deposited on the bottom of the river channel. For areas that will become depositional environments, please explain fully any negative effects associated with such deposits, and particularly for the area between Gull Lake and the Keeyask GS.	CAC-0049	Could you provide some examples of the kinds of adaptive measures that could be envisioned in the event of anticipated effects to water quality?	CEC Rd 2 CAC-0132a	CAC-IR Round 2-22

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		SV); 6.3.8.2 Sedimentation (R to EIS)			the region, and, (ii) how the release of peat and other sediment, along with increased mercury levels, is expected to negatively impact water quality in the study area, especially in places such as Gull Lake and Stephens Lake where fish habitat is predicted to be negatively impacted to the point of no longer being viable.	Lastly, if monitoring shows that water quality in the main part of the reservoir is not suitable for some or all aquatic life, what adaptive measures are being considered in response to such an eventuality?		The Partnership refers the reader to PE section 7 and TAC 72. However, having checked PE section 7 (and specifically section 7.4.2.3), as well as TAC Round 1 DFO-0072, it is still unclear what percentage of peat released from flooded terrestrial areas will settle in the bays of origin? This is variously described as the "majority" or "most", but without specific figures, it is not possible to know where we are talking about 51% or 99% of peat deposition.	CEC Rd 2 CAC-0132b	
CAC	R-EIS Guidelines	6.3.7.2 Shoreline Erosion Processes, 6.3.8 Sedimentation (R to EIS); Executive Summary	N/A	Physical Environment	While the EIS predicts that the magnitude of residual operation effects "associated with shoreline erosion processes" are expected to be large, subsequent discussions shift the emphasis to the observation that sediment loads will decrease rapidly over time, including the observation that "the overall amount of organic suspended sediment in the reservoir will be very low after the first few years of operation and will continue to be very low". However, given that sediment loads will fall only after a year one increase in annual organic sediment that is 1300 times greater than the current annual figure, while 30 years after inundation (Year 30 being "considered a reasonable model for the long-term condition of the reservoir") they will still be 18 times that of current annual levels, the above-quoted statement about decreasing sediment loads and future levels appears inaccurate.	Please provide more compelling evidence to validate the statement and prove its accuracy.	CAC-0050	In reference to Lines 24-27 of your response, please explain why it is appropriate to provide figures for changes in average annual loadings relative to Year 1 rather than Year 0?	CEC Rd 2 CAC-0133	CAC-IR Round 2-23
CAC	N/A	PE SV; AQ SV; YFFN Environmental Evaluation Report; FLCN Environmental Evaluation Report; R to EIS 6.2.3.2.1 Physical Environment	N/A	Physical Environment		Given the complex interactions that link shoreline erosion processes, organic and mineral sedimentation, debris, surface water temperature and dissolved oxygen, water quality and their individual and cumulative impact on human health and aquatic life, please provide the rationale for an environmental assessment that tackles each of these as separate components.	CAC-0051a	The response contains extensive references to integration. Integration is generally understood to mean "the combining and coordinating of separate parts or elements into a unified whole". Integration, as referred to, appears to revolve around the sharing and presenting of information and methods among the different study teams. While individual study teams may have benefited from data collected by other teams, integrated methods and data in this way, the EIS still presents these studies as separate sections. There was clearly communication between the technical science assessment process (including reports) and the KCN evaluation process/reports but integration appears to be limited given the decision for the Partners to carry out and present their own environmental evaluations. • To what degree does the integration spoken about in your response refer to just the technical science assessment process (including reports) versus integration between the technical science assessment process (including reports) and the KCN evaluation process/reports? • In terms of the technical science assessment process (including reports) and the KCN evaluation process/reports, is it accurate to say that the assessment of changes to the physical environment resulting from the Project was addressed in a "highly integrated manner"?	CEC Rd 2 CAC-0134	CAC-IR Round 2-24
						Please include information about the extent of communication and collaboration between the different teams of specialists who prepared the reports for each of these areas.	CAC-0051c	It is stated that the team "met regularly during the development of the EIS" and that "all these activities resulted in a highly collaborative, interdisciplinary approach to the assessment of effects to the physical environment". • Was that collaboration equally as high among Hydro staff and study team specialists as it was among these individuals and KCN representatives? • Please compare the number of meetings amongst the Keeyask Physical Environment Coordination Team as compared to the number of meetings among these individuals and the KCN representatives.	CEC Rd 2 CAC-0135	CAC-IR Round 2-25
CAC	N/A	6.4.2.1.5 Peat Resurfacing and Floating Peat Mat Mobility, 7.1.1.2 Peat Sedimentation, 10.4.2.1 Debris due to Reservoir Expansion (PE SV); 6.2.3.2.11 Debris, 6.3.8.2 Sedimentation, 6.3.11 Debris (R to EIS); 3.2 Keeyask Forebay Clearing Plan Draft 2006	N/A	Physical Environment	Peat-lands make up a significant portion of the 45km2 area that will be cleared and then flooded by the Project. Reservoir impoundment is predicted to expand by a further 7-8 km2 over the first three decades due to shoreline erosion, leading to more peat-land disintegration and break-up.	Even at the lower estimate, this still suggests the equivalent of 5-10km2 of peat resurfacing as debris. If this is considered small in magnitude, what amounts of peat debris would have to be seen in order to be considered medium or large in magnitude? Do these figures account for areas beyond the initial impoundment (159 masl) at risk to erosion and peatland disintegration after flooding?	CAC-0052b	Peat debris is considered small in magnitude – based on predictions of 2.7km2 of mobile peat for Year 1, 0.7km2 for Years 2-5, and 0.2km2 for years 6-15. If the above amounts are considered to be small in magnitude, please state what amounts of mobile peat would need to be seen in order to be considered medium and large in magnitude respectively? In lines 41-46 of the response, your definition of debris appears to cover only peat that is both mobile and in an area that impedes safe navigation. • Is this correct, or can we understand any resurfaced peat that is mobile to be considered debris, irrespective of its location, which appears to be the definition touted in lines 25-27 of the response? • What fraction of the peat that is potentially mobile will become debris that may need to be dealt with? Everything less than the whole is a fraction so this needs to be specified in order to quantify the amount that will be needed to be cleared. • In clarifying the above, please reconsider and comment on the statement made in Line 48 of the response that it "is not possible to reasonably determine how much (debris) will need to be dealt with? Can you confirm that all resurfaced peat (no matter the size) considered immobile (i.e. cannot be transported by wind and/or currents) poses no hazard to navigation?	CEC Rd 2 CAC-0136a	CAC-IR Round 2-26
CAC	N/A		N/A	Physical Environment		In light of the above, and given how variability in debris amounts can be increased due to fluctuations in water flow and levels, as well as variable ice conditions, please provide information about the capacity of the Waterways Management Program to cope with the removal of peat mats/blocks/islands etc. (in addition to woody debris) if levels are higher than expected, and given the current context where "minor amounts of organic sediment and floating peat are generated". In particular, how is the Program expected to deal with the fact that two-thirds of peat break-up and resurface is expected to happen in the first year? Similarly, how does the Program plan to manage debris removal adaptively given the uncertainty about how much debris may be mobile at any one time since it can go through "many cycles of being mobilized and immobilized as conditions on the waterway change over time"? On this issue, please provide evidence that supports the claim that "there is not expected to be any additional mobile peat after 15 years of operation". One scientific report (Keeyask Forebay Clearing Plan) states that there is "uncertainty regarding the full extent and rate of peatland disintegration and erosion. It is also impossible at this time to predict annual clearing requirements as numerous variables will affect the extent and rate of peatland disintegration and erosion from year to year". What guarantees are there that those requirements can be met?	CAC-0052c	In Line 44 of the response, it is stated that the "Program commits to having a large crew of up to 25 people on the reservoir during the first three to five years". What considerations will be employed in determining whether it will be three or four or five years? How many boats would this involve in total? Do any of the 25 people stated include maintenance crew or would all 25 be on the reservoir clearing debris?	CEC Rd 2 CAC-0137	CAC-IR Round 2-27

Department	Volume / Document	Line Number / Table Number / Figure Number	Page	Topic	Context / Preamble e.g., provide applicable background/rationale for providing the comment	Specific Department Comment / Request for Additional Information:	Round 1 Proponent Response	Round 2 Intervenor Question	Round 2 Response #	original intervenor IR#
						Lastly, please provide an estimate of the number of pieces of woody debris expected on an annual basis for years 1 through 30 post-inundation (following the report that between 2002 and 2008, the Program removed between 13 to 177 pieces per year). If the range is expected to be significantly higher than this, what measures will be taken to ensure the capacity of the Program to cope with such an increase?	CAC-0052d	In Lines 20-23 of the response, it is stated that "there is no reasonable means to estimate the number of pieces of debris that will need to be removed each year during Keeyask operation, nor the degree to which it may or may not exceed the amounts of debris removed in the past". Given this reality, how did the Partnership calculate the human and monetary resources that would be needed by the Waterways Management Program? It was stated that "once per-week trips by a two-person boat patrol crew" was responsible for picking up pieces of woody debris between 2002 and 2008. Does this cover all the pieces of woody debris that needed to be removed or, rather, was this the amount that these crews were able to remove in the time allotted to them (i.e. not all woody debris that needed to be removed were removed)?	CEC Rd 2 CAC-0138a CEC Rd 2 CAC-0138b	CAC-IR Round 2-28
CAC	N/A	6.3.3.1 and 6.3.3.2 Climate (R to EIS); 2.4.1 Effect of the Project on Climate Change; EIS Executive Summary 2012:42; Technical Memorandum 2012:55 (A Life Cycle	N/A	Physical Environment	Consistent with federal and provincial government efforts to reduce GHG emissions, the EIS states that the Project will "significantly displace coal-or-gas generated electricity that could produce over 200-times more greenhouse gas" and "while the construction and operation of the Project will result in short, small increases in regional GHG emissions, the operation of the Project will result in large reductions regionally over the long-term".	Do the Project Partners expect peat breakup in some areas to be offset by peat formation in others? If so, please provide details. Does the Project classify peat as a renewable biomass? How long does Hydro estimate it takes for peat to reaccumulate (convert to new peatland types) in the Local and Regional Stud Areas post-impoundment?	CAC-0053b	Does the Partnership classify peat in the Local Study Area as a renewable biomass? (This is in response to the response given in Lines 31-32 of the response, which fail to specify the Partnership's views)	CEC Rd 2 CAC-0139	CAC-IR Round 2-29
CAC	R-EIS Guidelines	Executive Summary; 6.0 Environment Effects Assessment	6, 33	Response to EIS Guidelines		<ul style="list-style-type: none"> Please provide evidence to show how the regulatory test for significance (of residual adverse effects) for the 38 VECs, a test that lies at the heart of the Keeyask environmental assessment process, provides "equal consideration to both technical/scientific studies and ATK [...] creating a thorough and comprehensive planning and environmental assessment process". Specifically, explain how the assessment process, as well as the negotiations and discussions that took place between the Partners, supports the claim of an "integrated and collaborative approach". Please stipulate the nature and extent of this "integration" (i.e. provide concrete examples across all aspects of the assessment process, as well as mitigation and adaptive management strategies). Please also describe the nature and extent of the efforts made to bridge the gap between what the regulations required and their synergy (or lack thereof) with the beliefs and views of the KCN partners? 	CAC-0054	Lines 37-38 of the response make reference to the Executive Summary of the EIS, specifically where it states, "these two separate evaluations as an integrated and collaborative approach". Further, in Lines 21-23 of the response under CAC-0060, it is stressed that "two separate types of evaluations" were carried out by "different authors for different purposes". In light of the above, and with reference to the preamble and questions found under CEC Rd 1 CAC-0051a, please explain how the strategy of two separate evaluations functioned as a collaborative and integrated assessment process? In particular, please describe in what ways the two separate evaluations were "integrated"?	CEC Rd 2 CAC-0140	CAC-IR Round 2-30
CAC	KCN-EVRPTS	YFFN Environmental Evaluation Report; FLCN Environmental Evaluation Report	N/A	Terrestrial Environment		For some among the KCN Partners, the VEC process was very difficult to accept, given that its very nature "ignores the interrelatedness of people, animals, water, landscape and plants". Please describe and provide details about the extent and nature of discussions held between Manitoba Hydro and the KCNs with regards to the selection of the VECs and/or the modification of selected VECs in order to reflect the Cree Worldview, and specifically the interrelatedness of people, animals, water landscape and plants. What was the outcome of these discussions?	CAC-0055a	Lines 32-36 of the response note that "in 2008, the Partnership held two major workshops with representation from the KCNs and Manitoba Hydro to review and discuss the concept of VECs and the proposed scope of VECs used in the environmental assessment". Please provide the dates, duration, names of attendees (and affiliation), and agendas for these workshops, and notes if available.	CEC Rd 2 CAC-0141	CAC-IR Round 2-31
CAC						Similarly, did any discussions take place between Manitoba Hydro and the four KCNs about making 'value' a designation of significance (in addition to those of 'nature', 'magnitude', 'geographical extent' and 'duration'), in order to better reflect Cree perspectives of the Keeyask homeland ecosystem (as stated in the respective environmental evaluation reports)? If these did take place, what was the nature and outcome of the discussions and what efforts made to modify the assessment process and test criteria in order to integrate Cree perspectives?	CAC-0055b	In Lines 24-29 of the Rd 1 response, you state that "the Partnership did not consider making 'value' a criterion for designation of significance" because "regulatory guidance is clear that the determination of regulatory significance... must be limited to questions related to scientific analysis and interpretation". Given that the EIS is based on a collaborative and integrated assessment process, with equal consideration given to technical scientific studies and ATK, do you consider the regulatory framework adequate given its inability to include 'value' as a criterion for designation of significance.	CEC Rd 2 CAC-0142	CAC-IR Round 2-32
CAC	N/A	YFFN Our Voices Report 2012; FLCN Environmental Evaluation Report 2012; Response to EIS Guidelines, Chapter 6.	N/A	Terrestrial Environment		<ul style="list-style-type: none"> Please provide information about the nature and extent of discussions between the Project Partners about the use of biodiversity offsetting as a principle mitigation tool. Specifically, did any of the Partners question whether biodiversity offsetting was consistent with a Cree Worldview, given that it circumvents the role that 'place' plays in the homeland ecosystem? If concerns were raised, how were these resolved? 	CAC-0056	Biodiversity offsetting was not applied by the Partnership as a principal mitigation tool for the Keeyask Generation Project, and none of the Partners discussed whether biodiversity offsetting was consistent with a Cree Worldview. Is biodiversity offsetting being used by the Partnership in any form as a mitigation tool?	CEC Rd 2 CAC-0143	CAC-IR Round 2-33
CAC	N/A	YFFN Our Voices Report 2012:71; FLCN Environmental Evaluation Report 2012:35; YFFN Our Voices Report 2012:69-94; Response to EIS Guidelines, Chapter 8.	N/A	KCN Environmental Evaluations	The Project is located in a region that has been greatly altered over the past five to six decades by development of the Lake Winnipeg Regulation Project (LWR), the Churchill River Diversion Project (CRD) and five generating stations. When KCN members spoke about Keeyask, many took the view that Keeyask is simply a continuation of one large development project, with their evaluation reports all detailing the impacts that previous Hydro developments have had on their homeland ecosystems and way of life. The EIS makes clear that the monitoring of changes and impacts will be measured against current conditions (i.e. prior to construction and operation of the Keeyask Dam and Generating Station). This is not consistent with the views of members of at least two of the KCNs, who believe that baseline conditions should be those that existed prior to the construction of the first dam in the region in the late 1950s.	Please respond to the difference in viewpoint between Manitoba Hydro and the KCN Partners around the issue of baseline data. If discussions took place between the Partners about this apparent discrepancy, please provide information about the nature and outcome of those discussions, and explain how collaborative monitoring is expected to function successfully in light of these differences - for "situations where ATK and technical assessments differ" how will monitoring be carried out and decisions made if the KCNs and Manitoba Hydro are working off of different sets of baseline data?	CAC-0057	In Lines 29-31 of your response, it is stated that "on the matter of monitoring, there is no difference in viewpoint between Manitoba Hydro and the KCN Partners around the issue of baseline data, i.e., the data against which changes will be measured after the Project is developed". In the Fox Lake Evaluation Report, and as highlighted in CEC Rd 1 CEC-0035, it is stated that "Our people define baseline as the condition of the land, waters and people prior to hydroelectric development which began in the early 1960s. This is in contrast to Manitoba Hydro's baseline defined as the existing condition of the terrestrial, aquatic, and socioeconomic environments". Please reconcile the Hydro statement with the position taken in the Fox Lake Evaluation Report. In Lines 60-61 and Lines 67-68 of the response, it is noted that "given the differing worldviews, there are naturally some cases where the conclusions reached to date by these two evaluation processes are different" and that "in such cases, the Partnership has developed monitoring programs that respond to the concerns raised through both worldviews". Can you provide examples of how monitoring will respond to the concerns raised through both worldviews? Secondly, has monitoring been seen as the only way to respond when differences in opinion arise between a KCN evaluation and the corresponding technical science study? <ul style="list-style-type: none"> Are there instances where another type of response has been forthcoming? If so, can you provide examples to illustrate the nature of that response? With reference to this IR, as well as those that refer to CAC-0054, CAC-0055a, CAC-0055b, and CAC-0056, are representatives from the KCN Partners consulted to help provide responses? If not, why not? 	CEC Rd 2 CAC-0144a CEC Rd 2 CAC-0144b	CAC-IR Round 2-34

Department	Volume / Document	Line Number / Table Number / Figure Number	Page	Topic	Context / Preamble e.g., provide applicable background/rationale for providing the comment	Specific Department Comment / Request for Additional Information:	Round 1 Proponent Response	Round 2 Intervenor Question	Round 2 Response #	original intervenor IR#
CAC	R-EIS Guidelines	C.9-4,5 and 11	N/A	Response to EIS Guidelines	<p>Rationale</p> <p>In several instances the project proponent outlines principles, policies, guidelines and goals for sustainable development that require enhancement of the natural environment, for which the proposed project is claimed to meet. Two examples are Goal 6 of Federal Sustainable Development Goals - Ecosystem / Habitat Conservation and Protection Goal – Maintain productive and resilient ecosystems with the capacity to recover and adapt; and protect areas in ways that leave them unimpaired for present and future generations.</p> <p>EIS Response – “Special efforts have been undertaken to avoid or minimize Project effects to habitat and ecosystem intactness and to replace the loss of important habitat types; for example, sensitive terrestrial habitat sites were avoided to the extent feasible when routing roads and locating borrow and excavated material placement areas. Overall, the likely Project related effects on ecosystem diversity are expected to be adverse but regionally acceptable because no stand level habitat types are lost, the distribution of area amongst the stand level habitat types is not expected to change substantially and the cumulative area losses for all of the priority habitat types remains below 10% (Keeyask HLP 2012, 9.5)”</p> <p>Principle 1 of Manitoba Hydro’s Sustainable Development Principles – Stewardship of the Economy and the Environment</p> <p>Principle – Recognize its responsibility as a caretaker of the economy and the environment for the benefit of present and future generations of Manitobans. Meet the electricity needs of present and future Manitobans in a manner that ensures the long-term integrity and productivity of our economy, our environment and our natural resources, and safeguards our human health.</p> <p>EIS Response – Consistent with the KCNs’ commitment to caring for Askiy and Manitoba Hydro’s commitment to sustainable development, the Project has been designed to minimize adverse effects and maximize benefits to local and regional residents. Manitoba Hydro and the KCNs have planned the Project together and completed more than a decade of both ATK and technical studies to predict and mitigate adverse effects and enhance Project benefits. (Keeyask HLP 2012, 9.11).</p> <p>In general, there are few to no mentions of enhancing the natural environment and improving ecological resilience. Where there are attempts described as improvements (such as a habitat and fish-stocking program (Keeyask HLP 2012, 9.4) there are concerns regarding whether such actions will in fact lead to long-term improvement.</p> <p>Given the historically negative impact of hydro development on the natural environment (as well as First Nations ways of living, etc.) it is imperative that future actions by Manitoba Hydro lead to improved environmental outcomes rather than simply avoiding adverse effects. Furthermore, given the proponents’ claims to have met various sustainability goals, principles, policies and guidelines, many of which require environmental enhancement, it is necessary for the proponent to better describe and justify how its actions will lead to such enhancement.</p>	<p>Please describe how the proposed EIS will have positive impacts on the environment as opposed to minimizing adverse harm. Please provide attention to:</p> <ul style="list-style-type: none"> • climate change mitigation • enhancement of long-term ecological resilience • appropriate land-use planning • the avoidance of adverse effects 	CAC-0066	<p>In several instances the project proponent outlines principles, policies, guidelines and goals for sustainable development that require enhancement of the natural environment, for which the proposed project is claimed to meet. Two examples are: Goal 6 of Federal Sustainable Development Goals - Ecosystem / Habitat Conservation and Protection with the EIS Response at Keeyask HLP 2012, 9.5</p> <p>Principle 1 of Manitoba Hydro’s Sustainable Development Principles – Stewardship of the Economy and the Environment with the EIS Response Keeyask HLP 2012, 9.11.</p> <p>However, there are few to no mentions of enhancing the natural environment and improving ecological resilience. Where there are attempts described as improvements (such as a habitat and fish-stocking program (Keeyask HLP 2012, 9.4) there are concerns regarding whether such CAC-IR Round 2-35</p> <p>July 31, 2013 CAC MB Sustainability CAC-IR-0066 actions will in fact lead to long-term improvement. It is imperative that future actions by Manitoba Hydro lead to improved environmental outcomes rather than simply avoiding adverse effects.</p> <p>Given the historically negative impact of hydro development on the natural environment (as well as First Nations ways of living, etc.) and the proponents claims to meet various sustainability goals many of which require environmental enhancements, it is important for the the proponent to describe how its actions will lead to such enhancements and provide justification in situations where enhancements will not be delivered.</p> <p>Description of Response</p> <p>The response provided was directly related to the individual bulleted sections – i.e. climate change mitigation, enhancement of long-term ecological resilience, appropriate land-use planning, the avoidance of adverse effects – without addressing the general intent of the question, which was to provide the proponent with an opportunity to describe how the project as a whole will have a positive impact on the environment and the resilience of nearby (local, regional, provincial) ecosystems. In this sense, the Partnership has provided a piecemeal response that does not easily – if at all – allow an informed opinion to be drawn. Moreover, there are some specific items of note that require additional clarification.</p> <p>Question regarding Climate change mitigation</p> <p>The Partnership refers to the Life Cycle Assessment of the Pembina Institute and discusses the potential displacement of CO2 during the early years of operation, however, it does not address the expected impacts of the dam on local ecological resilience to climate change.</p> <ul style="list-style-type: none"> • Please discuss whether it is expected that Projects effects such as the flooding and fragmentation of land, the increase in methyl-mercury concentration and other adverse effects are expected to have impacts on the ability of local ecosystems and individual species to adapt to climate change. • Please describe how the proposed project will have positive impacts on the environment, including the overall ability of local ecosystems to adapt to climate change. <p>Question regarding appropriate land-use planning</p> <p>With regards to appropriate land-use planning, the proponent simply mentions that the project is located on Crown lands, and that project effects considered existing landuse plans and processes during the assessment. This response provides no discussion of how land-use planning will be used to improve environmental outcomes in the future.</p> <ul style="list-style-type: none"> • Please describe how the proposed project will have positive impacts on the environment, including how appropriate land-use planning measures will be undertaken to improve environmental outcomes from an appropriate baseline. <p>Question regarding the advance of the adverse effects</p> <p>With regards to adverse effects, the Partnership responds by listing various mitigation measures and plans (e.g. the Waterways Management Program, the establishment of a Workers Interaction Committee). These plans and programs are all commendable, but once again they do not indicate any positive environmental outcomes, but rather attempts to lessen negative outcomes. Avoidance of adverse effects can only deliver positive effects if there are net benefits – if the avoidance allows gains that otherwise would not be possible, or if the avoidance is achieved in an undertaking that replaces some other activity that is or would be more damaging. Mere mitigation of adverse effects only makes a project less adverse.</p> <ul style="list-style-type: none"> • Please describe how the proposed project will have positive impacts on the environment, including how net environmental gains will be delivered. 	CEC Rd 2 CAC-0145	CAC-IR Round 2-35
CAC	R-EIS Guidelines	C.9-4,5 and 11	N/A	Response to EIS Guidelines	<p>Rationale</p> <p>In several instances the project proponent outlines principles, policies, guidelines and goals for sustainable development that require integrated decision-making, for which the proposed project is claimed to meet. Two examples are:</p> <p>Government of Manitoba Sustainable Development Principle – Integration of Environmental and Economic Decisions Principle – Economic decisions should adequately reflect environmental, human health and social effects. Environmental and health initiatives should adequately take into account economic, human health and social consequences.</p> <p>EIS Response – The proponent argues the project will provide clean affordable energy in comparison to coal and gas (Keeyask HLP 2012, 9.6).</p> <p>Manitoba Hydro Policy/Principle 3 – Integration of Environmental and Economic Decisions: Policy/Principle – Treat technical, economic and environmental factors on the same basis in all corporate decisions, from initial planning to construction to operations to decommissioning and disposal. To the extent practical, include environmental costs in</p>	<p>Please describe how the proposed EIS represents an integrated approach to decision-making and planning, particularly with regards to sustainable development. Please provide attention to:</p> <ul style="list-style-type: none"> • applying integrated assessment to seek the best alternative 	CAC-0066	<p>In several instances the project proponent outlines principles, policies, guidelines and goals for sustainable development that require integrated decision-making, which the Partnership claims the proposed project reflects. Two examples are</p> <p>Government of Manitoba Sustainable Development Principle – Integration of Environmental and Economic Decisions with the EIS Response at Keeyask HLP 2012, 9.6.</p> <p>Manitoba Hydro Policy/Principle 3 – Integration of Environmental and Economic Decisions: with the EIS Response at Keeyask HLP 2012, 9.12.</p> <p>Both responses by the proponent are noteworthy insofar as they illustrate attempts to increase positive outcomes from the project. However, it is unclear to what extent the EIS represents a serious attempt at integration. CAC-IR Round 2-36 July 31, 2013 CAC MB Sustainability CAC-IR-0067. The intent of integration is not simply to look at the cost of mitigating an adverse effect, but rather to consider positive and adverse effects in light of the entire full suite of requirements for progress towards sustainability, including their interactions. Likewise, the impacts of the project – both good and bad, on the natural environment, First Nation communities, the people of Manitoba, etc., both and now and in the future – cannot be separated into social, ecological, and economic components without neglecting key practical realities and losing much that is valuable in this world. Given the scale of this proposed project, and the potential it shows to provide long-term lasting benefits, if properly undertaken, it is important to ensure that the decisionmaking framework is appropriated integrated.</p> <p>Description of response</p> <p>The Partnership’s response is to note, “The Partnership considers this Information Request to be out of scope of the Clean Environment Commission review of the Keeyask Generation Project. The details being requested will be reviewed and</p>	CEC Rd 2 CAC-	CAC-IR Round 2-

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CAC	R-EIS Guidelines	9-9 and 12	N/A	Guidelines	<p>economic and financial analysis.</p> <p>EIS Response – A major example of this integration is the Project design. The Project incorporates mitigation, compensation and enhancement measures to reduce adverse environmental and social impacts and maximize benefits. By incorporating these measures into the Project's capital and operating budgets, the Project costs closely reflect the full societal cost of the Project (Keeyask HLP 2012, 9.12).</p> <p>Both responses by the proponent are noteworthy insofar as they illustrate attempts to increase positive outcomes from the project. However, it is unclear to what extent the EIS represents a serious attempt at integration. The intent of integration is not simply to look at mitigation or enhancement of effects in economic, social and biophysical areas, but rather to consider the entire full suite of requirements for progress towards sustainability, including their interrelations, covering interactive effects as well as effects in particular areas. Likewise, the impacts of the project - both good and bad, on the natural environment, First Nation communities, the people of Manitoba, etc. both and now and in the future – cannot be separated into social, ecological, and economic components without losing much, if not all, that many consider valuable in this world. Given the scale of this proposed project, and the possibility of the project providing long-term lasting benefits, if properly undertaken, it is important to ensure that the decision-making framework is appropriated integrated.</p>	<ul style="list-style-type: none"> the achievement of mutually reinforcing positive gains through all of Manitoba Hydro's activities the avoidance of tradeoffs 	CAC-007	<p>discussed as part of the Needs For and Alternatives To (NFAT) review of Manitoba Hydro's preferred development plan currently being undertaken by the Public Utilities Board (PUB) at the request of the Manitoba government." The proponent then proceeds to describe the terms of reference of the NFAT review.</p> <p>Leaving aside for a later date, the discussion of whether it is open to the CEC to consider alternatives, the response of the Partnership is not adequate. Regardless of whether the Partnership wishes to discuss 'alternatives to' in the EIS, it is still required to integrate economic and environmental decisions. Based on Manitoba Hydro's own sustainability policy/principle, it must "[t]reat technical, economic and environmental factors on the same basis in all corporate decisions, from initial planning to construction to operations to decommissioning and disposal." If all corporate decisions, from initial planning to construction to operation, to decommissioning must integrate economic and environmental factors, then clearly the EIS must reflect this integration. It is contingent upon Manitoba Hydro to show how it meets its own stated requirements.</p> <p>The Manitoba Government and Manitoba Hydro guidelines, policies and principles of sustainable development, clearly require integrated decision-making. In Chapter 9 of the EIS, The Partnership extolls the virtues of the proposed dam in light of these sustainable development criteria. Such claims must be supported by explicit presentation of integrated and comparative assessment that confirms the superiority of the asserted virtues.</p> <p>Question: Please describe how the proposed EIS represents an integrated approach to decision-making and planning, particularly with regards to sustainable development. Please provide attention to:</p> <p>a) applying integrated assessment through all of the Partnership's decision and planning process b) applying integrated assessment through all stages of the proposed dam c) the achievement of mutually reinforcing positive gains through all of the Partnership's activities d) the avoidance of tradeoffs.</p>	0146	36
CAC	R-EIS Guidelines	9-10 and 13	N/A	Response to EIS Guidelines	<p>Rationale</p> <p>In several instances the project proponent outlines principles, policies, guidelines and goals for sustainable development that relate to the development of a sustainable society. Two examples are:</p> <p>Manitoba Guidelines for Sustainable Development – Waste Minimization and Substitution: Guideline - (a) Encouraging and promoting the development and use of substitutes for scarce resources where such substitutes are both environmentally sound and economically viable; and (b) Reducing, reusing, recycling and recovering the products of society.</p> <p>EIS Response – While opportunities to recycle wastes in remoter northern areas are limited, waste generated by the Project will be minimized and waste materials will be recycled to the extent practical, and the remaining waste will be disposed of in accordance with license and regulatory requirements (Keeyask HLP 2012, 9.10).</p> <p>Manitoba Hydro Sustainable Development Policy/Principles – Conservation Policy/Principle – To the extent practical, plan, design, build, operate, maintain and decommission Corporate facilities in a manner that protects essential ecological processes and biological diversity. Give preference, where practical, to projects and operating decisions that use renewable resources or that extend the life of supplies of non-renewable resources.</p> <p>Response – Hydropower utilizes a renewable resource, thus assisting in the conservation of non-renewable resources such as gas or coal that otherwise would be used to generate the electricity being produced at the Project (Keeyask HLP 2012, 9.13).</p> <p>The responses by the proponent indicate positive steps, but much more is evidently needed. Both the guideline and the policy/principle provided above need to be understood more broadly in society. Neither of them relates solely, nor even primarily, to the environmental impacts of supplying electricity, but rather to the broader consumption of resources and production of wastes in society. Furthermore, this broader understanding of sustainability is illustrated in Manitoba Hydro's full set of sustainable development policy/principles (Manitoba Hydro n.d.). The proposed project represents an important opportunity for Manitoba to take steps in a transition towards a more sustainable society. For such a transition to take place, however, planning for future energy undertakings must take proactive measures to address both the supply of electricity as well as the end-uses of the electricity. At this point, however, it is unclear how the proposed project plays a role in the transition to a sustainable society beyond reducing GHG emissions.</p>	<p>Please provide as background an explanation of how the comparative assessment of alternatives leading to the project proposal included attention to sustainability principles including the one noted above in determining that the proposed project would be preferable to demand management alternatives.</p> <p>Please also describe how the proposed project will help Manitoba transition to a sustainable society that uses energy and resources in an efficient, benign and renewable manner. Please provide attention to:</p> <ul style="list-style-type: none"> the reduction of overall energy and resource consumption the promotion of appropriate uses of energy and matching of energy supply quality to final needs the development of a resilient energy system in Manitoba the avoidance of resource conflicts 	CAC-008	<p>In several instances the project proponent outlines principles, policies, guidelines and goals for sustainable development that relate to the development of a sustainable society. Two examples are: Manitoba Guidelines for Sustainable Development – Waste Minimization and Substitution; and (b) Reducing, reusing, recycling and recovering the products of society with the EIS Response at Keeyask HLP 2012, 9.10. Manitoba Hydro Sustainable Development Policy/Principles – Conservation with the EIS Response at Keeyask HLP 2012, 9.13. The responses by the proponent indicate positive steps but much more is needed. Both the guideline and the policy/principle provided above need to be understood more broadly in society. Neither of them relates solely, nor even primarily, to the environmental impacts of supplying electricity, but rather to the broader consumption of resources and production of wastes in society. Furthermore, this broader understanding of sustainability is illustrated in Manitoba Hydro's full set of sustainable development policy/principles (Manitoba Hydro n.d.). The proposed project represents an important opportunity for Manitoba to transition towards a more sustainable society. For such a transition to take place, however, large-scale projects, such as the Keeyask project, must be designed and implemented as proactive measures to address both the supply of electricity and the end-uses of the electricity. At this point, however, it is unclear how the proposed project plays a role in the transition to a sustainable society beyond reducing GHG emissions.</p> <p>Description of response The Partnership's response to the IR is to argue that the IR extends to matters beyond the scope of the CEC review which will be discussed at the NFAT review. This response is unacceptable. First, the terms of reference for the EIS clearly require a discussion of the impacts of the dam on the capacity of renewable resources: The EIS must describe the effects of the Project on the capacity of renewable resources to meet the needs of the present and those of the future. The EIS must identify those resources likely to be significantly affected by the Project, and describe how the Project could affect their sustainable use. The EIS must also identify and describe any criteria used in considering sustainable use. Sustainable use may be based on ecological considerations such as integrity, productivity, and carrying capacity (CEAA, 2012 #2582, p. 25) This requirement contradicts the Partnership's claim that the question is beyond the scope of the EIS. Second, Manitoba Hydro's own sustainable development policy/guidelines requires attention to renewable resources, non-renewable resources, and conservation. As noted in the original IR: Policy/Principle – To the extent practical, plan, design, build, operate, maintain and decommission Corporate facilities in a manner that protects essential ecological processes and biological diversity. Give preference, where practical, to projects and operating decisions that use renewable resources or that extend the life of supplies of non-renewable resources (Manitoba Hydro, n.d. #2584) Application of this policy/principle would entail work that is central to the information request and should be available for the CEC review. As noted above, the Partnership, in Chapter 9 of the EIS, extolls the virtues of the proposed dam in light of these sustainable development criteria and ought to show how its assessment, including attention to the items in this proposed IR, applied these principles.</p> <p>Question: Please describe how the proposed project will help Manitoba transition to a sustainable society that uses energy and resources in a renewable manner. Please provide attention to</p> <p>a) the reduction of overall energy and resource consumption b) the promotion of appropriate uses of energy and matching of energy supply quality to final needs c) the development of a resilient energy system in Manitoba d) the avoidance of resource conflicts.</p>	CEC Rd 2 CAC-0147	CAC-IR Round 2-37

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CAC	R-EIS Guidelines	C.9 – 6 and 14	N/A	Response to EIS Guidelines	<p>Rationale</p> <p>In several instances the project proponent outlines principles, policies, guidelines and goals for sustainable development that relate to the need for fostering and maintaining livelihood opportunities. Two examples are: Government of Manitoba Principles of Sustainable Development – Shared Responsibility and Understanding Principle – Manitobans should acknowledge responsibility for sustaining the economy, the environment, human health and social well-being, with each being accountable for decisions and actions in a spirit of partnership and open cooperation. Manitobans share a common economic, physical and social environment. Manitobans should understand and respect differing economic and social views, values, traditions and aspirations. Manitobans should consider the aspirations, needs and views of the people of the various geographical regions and ethnic groups in Manitoba, including Aboriginal peoples, to facilitate equitable management of Manitoba's common resources (Manitoba 1998).</p> <p>EIS Response – The processes for developing the Project have included the development of a partnership that is intended, in part, to meet the societal, cultural, economic and employment aspirations of the local KCNs communities, which include the continuation of traditional and cultural practices, as well as a deeper integration into the regional and provincial economy. Discussions leading to the formation of the Partnership and the planning and environmental assessment activities have led to a growing understanding and respect for the different values, and worldviews of Manitoba Hydro and the KCNs. (Keeyask HLP 2012, 9.6).</p> <p>Manitoba Hydro Sustainable Development Policy/Principles – Understanding and Respect Policy/Principle – Strive to understand and respect differing social and economic views, values, traditions and aspirations when deciding upon or taking action. Give preference to those alternatives that best fulfil Corporate objectives while minimizing infringement on the ability, rights, and interests of others to pursue their aspirations.</p> <p>EIS Response – The Project proponent is a partnership comprising Manitoba Hydro and the KCNs. Considerable effort has been made in forging constructive relationships between Manitoba Hydro and the KCNs, including facilitating community studies aimed at understanding history, community history, and more importantly the Cree worldview and ATK. This growing understanding has had a major impact on Project design, construction and operation. It has also led to specific arrangements through community-specific [adverse effects agreements]” (Keeyask HLP 2012, 9.14).</p> <p>Both responses are notable insofar as they recognize the shared responsibility of the project proponents to ensure lasting and desirable livelihood opportunities and foundations, particularly among the First Nation communities. While the EIS contains significant discussion relating to livelihood opportunities, no overall picture emerges from the discussions with regards to the overall and integrated effects on livelihood opportunities, especially lasting ones. A project of this scope may provide Manitoba Hydro an important opportunity to meet the goals of sustainable livelihood foundations over the entire lifecycle of the project (e.g. construction, operation, end-use of the electricity). To obtain these benefits requires a proactive and integrated approach to decisionmaking.</p>	<p>Please describe how the proposed project will ensure sufficient and desirable livelihood opportunities both now and in the future. Please provide attention to:</p> <ul style="list-style-type: none"> • basic livelihood foundations (e.g. skills and education, social capital) • protection of the most vulnerable • lasting local economic development • maintenance of First Nations ways of living; and • prevention of boom and bust cycles <p>Please describe how the proposed project compares with alternatives to and alternative means of the project with regards to fostering livelihood opportunities.</p>	CAC-0069	<p>In several instances the project proponent outlines principles, policies, guidelines and goals for sustainable development that relate to the need for fostering and maintaining livelihood opportunities. Two examples are Government of Manitoba Principles of Sustainable Development – Shared Responsibility and Understanding with the EIS Response at Keeyask HLP 2012, 9.6.</p> <p>Manitoba Hydro Sustainable Development Policy/Principles – Understanding and Respect at Keeyask HLP 2012, 9.14.</p> <p>Both responses are notable insofar as they recognize the shared responsibility of the project proponents to ensure lasting and desirable livelihood opportunities and foundations, particularly among the First Nation communities. While the EIS contains significant discussion relating to livelihood opportunities, no overall picture emerges from the discussions with regards to the overall and integrated effects on livelihood opportunities. A project of this scope provides the Partnership with an important opportunity to meet the goals of sustainable livelihood foundations over the entire lifecycle of the project (e.g. construction, operation, end-use of the electricity). To obtain these benefits requires a proactive and integrated approach to decision-making.</p> <p>Description of response</p> <p>The Partnership provides a fairly lengthy response that is commendable insofar as it addresses various facets of the original question. Unlike the EIS, which generally argues there will be no boom and bust dynamics, the response to the IR offers a more nuanced discussion: There is no doubt that a project of this nature has the potential to create a boom-bust cycle within the KCNs and in other local communities. The extent to which this boom-bust cycle is experienced will, in part, depend on the level of participation in the Project by individual KCNs members, the timing of other future developments in the region (e.g., development of the proposed Conawapa Generation Project) and measures implemented by leadership at the community level. Counseling services, including financial counseling, are provided for site employees and may help to assist individual employees and their families with this transition at the end of the Project construction period. While this elaboration of potential boom and bust dynamics, and anticipated responses to negative effects, is useful, the response does not address how boom and bust may be avoided. A careful analysis of means of avoiding and softening adverse boom and bust dynamics, including project scheduling, is crucial and to the best of our knowledge has not been provided.</p> <p>Question:</p> <p>Please provide further information on boom and bust dynamics in the Keeyask project, including, but certainly not limited to:</p> <ol style="list-style-type: none"> a) The factors that may lead to boom and bust (due to Keeyask and other reasonably anticipated projects (e.g. Conawapa) b) What steps the Partnership will take to prevent adverse boom and bust from occurring c) What steps the Partnership will take to manage, mitigate, make reparations for, any boom and bust that does occur. 	CEC Rd 2 CAC-0148	CAC-IR Round 2-38
					<p>Rationale</p> <p>In several instances the project proponent outlines principles, policies, guidelines and goals for sustainable development that relate to the need to leave a positive legacy for future generations. Two examples are:</p> <p>Government of Manitoba Principles of Sustainable Development – Stewardship</p> <ul style="list-style-type: none"> • Principle – The economy, the environment, human health and social well-being should be managed for the equal benefit of present and future generations. Manitobans are caretakers of the economy, the environment, human health and social well-being for the benefit of present and future generations. Today's decisions are to be balanced with tomorrow's effects. • EIS Response – Partnership income will be beneficial to generations of KCNs community Members, and will provide sustained revenues to the broader Manitoba economy. (Keeyask HLP 2012, 9.6). <p>Government of Manitoba Guidelines for Sustainable Development –Integrated Decision Making and Planning</p>	<p>Please describe how the proposed project will leave a positive legacy for future generations. Please provide attention to:</p>		<p>In several instances the project proponent outlines principles, policies, guidelines and goals for sustainable development that relate to the need to leave a positive legacy for future generations. Two examples are Government of Manitoba Principles of Sustainable Development – Stewardship with the EIS Response at Keeyask HLP 2012, 9.6.</p> <p>Government of Manitoba Guidelines for Sustainable Development –Integrated Decision Making and Planning with the EIS Response at Keeyask HLP 2012, 9.9.</p> <p>The responses by the proponent are commendable insofar as they outline various attempts to ensure a positive legacy, particularly with regards to First Nations communities. However, there is a need to broaden the scope of analysis when considering what a positive legacy entails.</p> <p>Description of response</p> <p>The Partnership provides a lengthy response that addresses some of the questions noted in the IR. However, there are still some concerns of note. First, the response ignores broader legacy questions. As a crown corporation Manitoba Hydro has a duty to ensure a positive legacy more broadly in society. Some relevant – although nonexhaustive – issues include the extent to which future concerns will be met by present savings (e.g. setting aside money and resources for successful adaptive environmental management), as well as ensuring that future generations have sufficient resources and capital (social, financial, natural, etc.) to meet their needs. A project of this scope provides the Partnership with an important opportunity to ensure that future generations are left with such a positive legacy, and this is something the EIS should explicitly and fully address.</p>		

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CAC	R-EIS Guidelines	C.9-8 and 15	N/A	Response to EIS Guidelines	<p>• Guideline – Encouraging and facilitating decision making and planning processes that are efficient, timely, accountable and cross-sectoral and which incorporate an inter- generational perspective of future needs and consequences.</p> <p>• EIS Response – “The Partnership has established a governance structure that includes KCNs representation. As part of this structure, the communities have had direct involvement in the environmental assessment and will continue to have a strong role with their Aboriginal traditional knowledge (ATK) in the monitoring and follow-up programs. Each partner concerns itself with the short and long-term benefits and costs of the Project. Multi-generational benefits are key to the commitment of the KCNs’ participation in the Project (Keeyask HLP 2012, 9.9).</p> <p>The responses by the proponent are commendable insofar as they outline various attempts to ensure a positive legacy, particularly with regards to First Nations communities. However, there is a need to broaden the scope of analysis when considering what a positive legacy entails. With reference to the guideline and principle provided above, as a crown corporation Manitoba Hydro has a duty to ensure a positive legacy more broadly in society. Some relevant – although non-exhaustive – issues include the extent to which future concerns will be met by present savings (e.g. setting aside money and resources for successful adaptive environmental management), as well as ensuring that future generations have sufficient resources and capital (social, financial, natural, etc.) to meet their needs. A project of this scope provides Manitoba Hydro an important opportunity to ensure that future generations are left with such a positive legacy, and this is something the EIS should explicitly and fully address.</p>	<ul style="list-style-type: none"> the long-term availability of energy and other resources the potential for future generations to live sustainability (including maintenance of First Nations ways of living) how future needs will be met by present savings 	CAC-0070	<p>Second, in general the response provided by the Partnership does little to describe leaving a positive legacy. While the dam will likely provide renewable energy in the form of electricity for many decades, many of the other long-term impacts (and hence legacy impacts) are negative and require mitigation (e.g. through the Adverse Effects Agreements). While the Partnership’s response includes a reference to the common short version of the Brundtland definition of sustainable development, the EIS and the description in the response are largely concerned with trying to make things less bad. It is contingent on the Partnership to provide a fuller description of how the proposed dam will make the future better.</p> <p>Third, the Partnership’s response regarding the long term revenue for KCN communities needs further elaboration. It is unclear what steps will be taken to ensure that community revenues are used in a constructive manner. Just as one example, the EIS itself notes that historically extra income has led to increased alcohol, gambling and drug use in many communities affected by resource development projects, it is important to ensure that this will not be the case in the proposed project. Otherwise, the revenue flow could have negative overall effects on the KCN communities.</p> <p>Fourth, the Partnership’s response provides little indication of how present resources will be set aside for future generations.</p> <p>In elaborating on your response to how the proposed project will leave a positive legacy please provide attention to:</p> <p>a) A full description of how the project effects will lead to a better world for future generations, over and above the oft-cited low greenhouse gas emissions of hydroelectricity</p> <p>b) How the project effects will provide for future generations greater resources and opportunities to live sustainability (including First Nations’ ways of living)</p> <p>c) How future needs will be met by present savings.</p>	CEC Rd 2 CAC-0149	CAC-IR Round 2-39
CAC	R-EIS Guidelines	C.9-8 and 15	N/A	Response to EIS Guidelines	<p>Rationale</p> <p>In several instances the project proponent outlines principles, policies, guidelines and goals for sustainable development that relate to the need to leave improved equity outcomes. Two examples are:</p> <p>Government of Manitoba Guidelines for Sustainable Development –Global Responsibility Guideline – Manitobans should think globally when acting locally, recognizing that there is economic, ecological and social interdependence among provinces and nations, and working cooperatively, within Canada and internationally, to integrate economic, environmental, human health and social factors in decision-making while developing comprehensive and equitable solutions to problems.</p> <p>Response – “A detailed Life Cycle Assessment was conducted by the Pembina Institute in order to estimate the GHG emissions resulting from the construction, land use change, operation, and decommissioning of the Project. The resulting emissions are extremely low relative to other forms of generation. An equivalent amount of electricity, produced by a combined cycle natural gas generating station during one year of operation would result in more than double the entire life cycle emissions estimated associated with the Keeyask Project over a 100 year period. Since the Project will displace gas and coal generation, primarily in the U.S. Midwest, it will contribute to substantial GHG reductions. The Project is estimated to displace 30 million tonnes carbon dioxide equivalent during the first 10 years of operation” (Keeyask HLP 2012, 9.8).</p> <p>Manitoba Hydro’s Sustainable Development Principle – Global Responsibility:</p> <p>Principle – Recognize there are no political and jurisdictional boundaries to our environment, and that there is ecological interdependence among provinces and nations. Consider environmental effects that occur outside of Manitoba when planning and deciding on new developments and major modifications to facilities and to methods of operation</p> <p>Response – “The Project will contribute to substantial reductions in greenhouse gases (GHG) by displacing fossil fuel electricity generation” (Keeyask HLP 2012, 9.15).</p> <p>As has been previously noted, the reduction in GHG emissions is important and commendable. However, the Government of Manitoba’s Guideline notes the economic, ecological and social interdependence among provinces and nations, and this interdependence requires extending considerations of equity well beyond GHG emissions.</p> <p>The proposed Keeyask project – along with Manitoba Hydro’s other projects – may present an opportunity to continue building a foundation for a more just and equitable Manitoba, from the construction phase through final use of the electricity over the long anticipated lifetime of the project. The process of striving for greater equity must begin at the planning stage. At this point, however, it is unclear what steps are being taken to promote both inter- and intra-generational equity in their various manifestations.</p>	<p>Please describe how the proposed project will promote greater equity. Please provide attention to</p> <ul style="list-style-type: none"> the fair distribution of benefits and risks the fair access to resources and opportunities the accounting of impacts from previous developments the shared responsibility amongst all partners to seek equitable outcomes and processes the promotion of equity both between and within generations 	CAC-0071	<p>In several instances the project proponent outlines principles, policies, guidelines and goals for sustainable development that relate to the need to leave improved equity outcomes. Two examples are as follows:</p> <p>Government of Manitoba Guidelines for Sustainable Development –Global Responsibility with the EIS Response at Keeyask HLP 2012, 9.8. Manitoba Hydro’s Sustainable Development Principle – Global Responsibility with the EIS Response at Keeyask HLP 2012, 9.15. As has been previously noted, reduction in GHG emissions is important and commendable. However, the Government of Manitoba’s Guideline notes the economic, ecological and social interdependence among provinces and nations, and this interdependence requires extending considerations of equity well beyond GHG emissions.</p> <p>The proposed Keeyask project – along with Manitoba Hydro’s other projects – presents an opportunity to continue building a foundation for a more just and equitable Manitoba, both through the construction and operational phases of the project itself, as well as through the final use of the electricity over the long anticipated lifetime of the project. The process of striving for greater equity must begin at the planning stage. At this point, however, it is unclear what steps are being taken to promote both inter- and intra-generational equity in their various manifestations.</p> <p>Description of the Partnership’s response</p> <p>The Partnership’s response to the IR is to argue that the IR is out of the scope of the CEC review, and instead this information will be discussed at the NFAT review. This response reveals an impoverished understand of the CEC Terms of Reference The CEC is tasked with incorporating “where appropriate, the Principles of Sustainable Development and Guidelines for Sustainable Development as contained in the Sustainable Development Strategy for Manitoba.” Three relevant principles, with elaborations, are reproduced in the box below:</p> <p>Stewardship:</p> <ul style="list-style-type: none"> The economy, the environment, human health and social well-being should be managed for the equal benefit of present and future generations. Manitobans are caretakers of the economy, the environment, human health and social well-being for the benefit of present and future generations. Today’s decisions are to be balanced with tomorrow’s effects. <p>Shared Responsibility and Understanding:</p> <ul style="list-style-type: none"> Manitobans should acknowledge responsibility for sustaining the economy, the environment, human health and social well-being, with each being accountable for decisions and actions in a spirit of partnership and open cooperation. Manitobans share a common economic, physical and social environment. Manitobans should understand and respect differing economic and social views, values, traditions and aspirations. Manitobans should consider the aspirations, needs and views of the people of the various geographical regions and ethnic groups in Manitoba, including Aboriginal peoples, to facilitate equitable management of Manitoba’s common resources. <p>Global Responsibility:</p> <ul style="list-style-type: none"> Manitobans should think globally when acting locally, recognizing that there is economic, ecological and social interdependence among provinces and nations, and working cooperatively, within Canada and internationally, to integrate economic, environmental, human health and social factors in decision-making while developing comprehensive and equitable solutions to problems. <p>All three of these principles of sustainable development reference equity considerations, both within and between generations. Given the potential for the proposed dam to have significant environmental, economic, social, and cultural impacts, it is imperative that the benefits and risks of the project be equitably shared. In Chapter 9 of the EIS, the Partnership extolls the virtues of the proposed dam in light of sustainable development criteria. Such claims must be supported by explicit presentation of an equity effects assessment for the Keeyask project.</p> <p>Given that the Partnership declined to answer the original IR, despite it clearly being a within the scope of the CEC terms of reference, the question is reposed:</p> <ul style="list-style-type: none"> Please describe how the proposed project will promote greater equity. Please provide attention to a) the fair distribution of benefits and risks b) the fair access to resources and opportunities c) the accounting of impacts from previous developments d) the shared responsibility amongst all partners to seek equitable outcomes and processes e) the promotion of equity both between and within generations 	CEC Rd 2 CAC-0150	CAC-IR Round 2-40

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CAC	R-EIS Guidelines	9 – 6 and 13	N/A	Response to EIS Guidelines	<p>In several instances the project proponent outlines principles, policies, guidelines and goals for sustainable development that relate to the long-term capacity to respond. Two examples are</p> <p>Government of Manitoba Guidelines for Sustainable Development –Stewardship</p> <p>Guideline – The economy, the environment, human health and social well-being should be managed for the equal benefit of present and future generations. Manitobans are caretakers of the economy, the environment, human health and social well-being for the benefit of present and future generations. Today's decisions are to be balanced with tomorrow's effects.</p> <p>Response – Stewardship of the environment will continue through ongoing monitoring and follow-up programs involving KCNs communities and Manitoba Hydro, and AEA programs will enhance the cultural identity and connection to the land of present and future generations which in turn will contribute to social well being. (Keeyask HLP 2012, 9-6).</p> <p>Manitoba Hydro's Sustainable Development Principle – Prevention and Remedy</p> <p>Principle – To the extent practical, anticipate and prevent adverse environmental and economic effects that may be caused by Corporate policies, programs, projects and decisions rather than reacting to and remedying such effects after they have occurred. Purchase, where practical, environmentally sound products taking into account the life cycle of the products. Address adverse environmental effects of Corporate activities that cannot be prevented by: (1) endeavouring, wherever feasible, to restore the environment to predevelopment conditions or developing other beneficial uses through rehabilitation and reclamation; (2) striving to replace the loss with substitutes that would enhance the environment and/or associated resource uses while offsetting the type of damage experienced; (3) making monetary payments for compensable damages on a fair, equitable and timely basis. Give preference, where practical, to projects and operating decisions that use renewable resources or that extend the life of supplies of nonrenewable resources.</p> <p>Response – "A number of measures have been taken to prevent and minimize adverse effects, the most substantial being to reduce the size of the Project. At one time, a high head project with 180 km2 of initial flooding was under consideration; in contrast, the current Project that will result in 45 km2 of initial flooding. As another example, a combination of habitat enhancement measures and a fish stocking program that includes a fish hatchery will enhance the population of lake sturgeon in the Project area. As another example of anticipating and remedying effects before they occur, AEAs with the KCNs were negotiated as proactive measures in advance of the development, and programs under those agreements will address effects on resource users" (Keeyask HLP 2012, 9.13).</p> <p>The responses by the project proponents are commendable. However, the responses do not sufficiently indicate the capacity of the project proponents to respond to both foreseen and unforeseen events. For example, an analysis of climate change scenarios by Manitoba Hydro forecasted an increase in average temperature by 4.1°C and an increase in precipitation of 14% by the 2080s (Manitoba Hydro 2012, iv). Such increases in temperature and precipitation will have major interacting implications for Manitoba's social, economic and ecological conditions, and for the proposed project. If only for this reason, it is imperative that a project with such a long lifespan be designed from early stages to be adaptable to change. Furthermore, it is imperative for reasons of equity and long-term ecological integrity, among other things, that sufficient resources are secured to provide future generations the ability to respond appropriately to future circumstances. At this point it is unclear the extent to which the proposed project will be designed in a manner to ensure the full capacity to respond.</p>	<p>Please describe how the proposed project will ensure the long-term capacity to respond to both foreseen and unforeseen challenges and opportunities. Please provide attention to:</p> <ul style="list-style-type: none"> • the adaptability of the design • the development of responsive monitoring and adaptive management plans • the resources (financial and otherwise) and ability to act upon foreseen and unforeseen challenges and opportunities (esp. climate change) • the development of appropriate baseline data • the attention to uncertainty, including irreducible uncertainty • the ability to avoid lock-in 	CAC-0072	<p>Description of the Partnership's response</p> <p>The Partnership provides a lengthy response, which is commendable insofar as it addresses a wide range of concerns. Within the response, however, there are some areas needing further clarification.</p> <p>First, with regards to "Resources and ability to act upon foreseen and unforeseen challenges and opportunities," the Partnership's response is the following</p> <p>The Project proposal put forward by the Partnership provides substantial commitments with respect to long-term mitigation and monitoring activities through negotiated terms outlined in the Joint Keeyask Development Agreement and in the KCNs Adverse Effects Agreements, as well as through measures identified in the EIS. Implementation of these measures as part of overall Project development means Keeyask will be constructed and operated in a manner that is environmentally and socially responsible and demonstrates a commitment by the Partnership to provide the resources and ability to act upon foreseen and unforeseen challenges and opportunities. This, combined with the extensive efforts undertaken by the Partnership to design the Project in a manner that</p> <p>minimizes environmental effects, reduces the potential for future generations to bear the costs of unsound development practices. However, the Partnership has not shown how it will develop these resources. Given the importance of not displacing burdens onto future generations of ratepayers and First Nations, it is imperative for the Partnership to explain how it is setting aside resources (financial and otherwise) to deal with these eventualities. Unfortunately, the response to the IR provides no such indication of how future needs will be met by present savings and planning.</p> <p>Second, with regards to the development of appropriate baseline data, the Partnership's response is the following: Baseline data consists of a comprehensive multidiscipline Project-specific program initiated in 2000 and in many cases continuing until Project Construction, which has been adapted over time based on review of relevant literature and feedback from the general public, affected in-vicinity Aboriginal communities, regulators and peer reviewers. This response provides little elaboration about the baseline data. For example, it is not even certain whether the year 2000 has been chosen as the standard baseline and why this might be appropriate. Given the historical impacts of hydro development on Keeyask Cree Nations, there have been calls for the baseline to be set at pre-development times.</p> <p>Furthermore, the response provides no mention of where further information on baseline data can be sought. Third, with regards to "ability to avoid lock-in", the Partnership's response is the following: The design of the generating station permits it to operate efficiently using different modes of operation. This will allow the station operation to adapt to potential changes to inflow conditions because of climate change. The design will also allow the station to adapt to varying demands of Manitoba Hydro's Integrated Power System which may also change due to climate change or other factors. When using the different modes of operation, the station will operate efficiently without the reservoir level deviating outside of the 1 m operating range. By turning units on and off in response to changing inflow and power demand requirements, the vertical-shaft fixed-blade units could be operated at or near peak efficiency under nearly all flow conditions.</p> <p>This response addresses some very basic concerns about lock-in but neglects the larger issue that a hydro dam is effectively irreversible, and Manitoba is effectively locked into a new ecological system in the project area with its consequent social, ecological, economic, cultural, etc. effects. Likewise, if the dam is built, there will be pressure to produce and consume as much electricity as the dam can generate so as to ensure economic viability, potentially leading to oversupply and wasteful consumption of electricity.</p> <ul style="list-style-type: none"> • In elaborating on your earlier reply discussing how the proposed project will ensure the long-term capacity to respond to both foreseen and unforeseen challenges and opportunities, please provide additional consideration to: <ul style="list-style-type: none"> a) the resources (financial and otherwise) and ability to act upon foreseen and unforeseen challenges and opportunities (esp. climate change), and how these resources will be secured; b) the development of appropriate baseline data; and, c) the extent to which the proposed project avoids lock-in and irreversibility, and allows for supply and demand to increase incrementally and in response to one another in an appropriate manner. 	CEC Rd 2 CAC-0151	CAC-IR Round 2-41
CAC	R-EIS Guidelines	C. 9-4 and 8	N/A	Response to EIS Guidelines	<p>Rationale</p> <p>In several instances of the EIS, the proponent argues the proposed project is promoting sustainable development by avoiding the GHG emissions from the coal-fired and natural gas-fired electricity that would otherwise be providing the electricity (e.g., Keeyask HLP 2012, 9.4 and 9.8). The amount of GHG offsetting is both significant and commendable. However, there are certain issues that add complexity to the matter.</p> <p>First, it is not clear that the electricity produced by the proposed Keeyask project will replace existing electricity demand or facilitate additions to it (i.e. it is latent demand). If the goal is to promote sustainable development by reducing GHG emissions, it is important to ensure the project effects will reduce overall GHG emissions from current levels, as opposed to reducing the rate of increase of GHG emissions. Meeting the higher test of reducing current GHG emissions requires a proactive approach, but one that is within the potential of an electricity provider as important and large as Manitoba Hydro.</p> <p>Second, it is not clear how the anticipated GHG displacement attributable to the proposed project compares with alternatives to the project, such as enhanced conservation options and energy efficiency. It may be that increased generating capacity is not the preferred means of reducing GHG emissions in both the near term (e.g. the upfront GHG emissions related to the flooding and construction of the dam) and the long-term.</p>	<p>Please elaborate further on how the proposed project will reduce GHG emissions in both the nearterm and long-term. Please provide attention to:</p> <ul style="list-style-type: none"> • the extent to which the proposed project would be replacing existing coal-fired and natural gas-fired supply, or adding to that supply • the extent to which the project would help to support rather than compete with demand management efforts and options • how the GHG emissions reduction of the proposed project compare with alternatives to the project (e.g. conservation and efficiency) 	CAC-0073	<p>The EIS must include an analysis of alternatives to the Project which describe functionally different ways to meet the project need and achieve the project purpose from the perspective of the proponent. Analysis of "alternatives to" project should validate that the preferred alternative is a reasonable approach to meeting need and purpose.</p> <p>Second, the EIS is wholly inconsistent with regards to the discussion of alternatives. In several instances, such as was noted above concerning Manitoba Hydro's response to this IR, the EIS includes discussion of the greenhouse gas emissions of the proposed dam in comparison those of with alternatives (coal, natural gas, wind and nuclear). However, this comparison is irrelevant if coal, natural, wind and nuclear are not alternatives to the project. And if they are considered alternatives to the project, no reason is provided for the omission of other forms of generation (e.g. solar, bioenergy) as well as conservation and demand management.</p> <p>Ultimately, it is clear that for the purpose of the CEC review there are important considerations raised by the proposed project that require the comparative evaluation of alternatives. Manitoba Hydro's current approach of discussing alternatives when it shows the proposed project in a positive light (i.e. with regards to estimated greenhouse gas emissions) and hiding from discussions of alternatives in all other instances hinders the decision-making process and omits information and analysis that is clearly necessary for the CEC panel.</p> <p>Request for additional information</p> <p>Based on Manitoba Hydro's response to the IR, we request the question be posed again: Please elaborate further on how the proposed project will reduce GHG emissions in both the near-term and long-term. Please provide attention to:</p> <ul style="list-style-type: none"> a) the extent to which the proposed project is replacing existing coal-fired and natural gas-fired demand, or adding to that demand b) how the GHG emissions reduction of the proposed project compare with reductions that could be achieved by alternatives to the project (e.g. conservation and efficiency)? 	CEC Rd 2 CAC-0152	CAC-IR Round 2-42

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CAC	TE SV	7.2.6.2 Intactness	7-10	Terrestrial Environment	On page 7-10 of Section 7.2.6.2 (Terrestrial Environment), some elements in the following passage are unclear: "Benchmark values for intactness indicated a low magnitude adverse effect where core area, as a percentage of land area, is greater than 65%, a moderate magnitude adverse effect where core area percentage is between 45% and 65%, and a high magnitude adverse effect where core area percentage is lower than % ... Benchmark values for intactness indicated a low magnitude adverse effect where less than 35% of the range is undisturbed, a moderate magnitude adverse effect when 35% to 45% of the range is undisturbed, and a high magnitude adverse effect when more than 45% of the range is disturbed ..."	In the first sentence, please confirm that the final percentage value, which is missing, is 45% In the second sentence, please confirm that "undisturbed" should be replaced with "disturbed".	CAC-0003	The strategy chosen by the proponents for downstream passage of fish is via the turbines and spillways. Although efforts can (and have) been made to design these structures to minimize injury and mortality to fish, the bottom line is that they are not actually meant to safely pass fish downstream. That said, a survival rate of 90% for fish smaller than 500 mm (a number determined by relatively rigorous empirical experimentation) seems reasonable, given that this size would encompass most of the range for most of the "non-sturgeon" VEC species, northern pike being a notable exception. The strategy also seems reasonable, given that there are decent numbers of non-sturgeon VEC's in the affected area. However, the same cannot be said for lake sturgeon. Literally all of the spawning adults that encounter the turbine intakes will be passed through and potentially killed at an expected (not empirically determined for sturgeon) rate as high as 45% and potentially more for large spawning-sized fish. In addition, there is a great degree of uncertainty associated with almost all aspects of this mitigation strategy. Work at Slave Falls suggests that adult lake sturgeon can be expected to encounter the upstream side of a dam and become entrained; however, factors that impact this proportion are unknown and encounter rates are likely quite variable. The probability of trash rack impingement is unknown (just because a fish will fit between the bars doesn't automatically mean they will pass through the trash rack), as is the fate of impinged fish, as is the true injury and mortality rate of lake sturgeon passing through the turbines. Much of the same can be said for spillway passage. As such, the planned approach cannot reasonably be called a "safe passage" strategy for adult lake sturgeon. It is more like a mitigation program for entrainment. • In any case, the issue that really needs to be addressed is that, given the above arguments, are the risks and uncertainties worth the "reward" (i.e. downstream passage)? Are the benefits of passing lake sturgeon downstream worth the risks in this severely depleted population? • These questions lead to a more basic question. What are the benefits of providing downstream passage? • The response to CEC-0031 included the statement "The study (carried out by the fish passage team) concluded that as a result of high uncertainty associated with the success of current downstream passage options, and because the Keeyask turbine designs had been modified to reduce mortality rates of fish passing through them, the best available approach to downstream fish passage would be through the turbines (and spillway, when in operation)." Was there any discussion as to whether downstream passage was really needed for all the species? • Given that adult lake sturgeon are by far the most at risk to be injured or killed via entrainment or impingement, is it not more reasonable to selectively exclude them by reducing bar spacing in the trash racks and/or installing species-specific structural or behavioural guidance systems? • Cannot connectivity (for whatever it might be worth) for this species be maintained simply by manually moving a few adults downstream yearly during the existing trap and transport program? This would conceivably result in the lowest chance of adult mortality (~0%) and the highest (~100%) chance that migration would not only occur in one direction. The proponents are asked to comment in detail on the above discussion.	CEC RD 2 CAC-0153	CAC-IR Round 2-43
CAC	R-EIS Guidelines	Parameters Considered for Turbines to Increase Fish	N/A	Aquatic Environment	Entrainment of fish through turbines has been proposed as a reasonable method of providing downstream passage for fish. Measures have been taken by the proponent to reduce mortality associated with injury and mortality. Trash racks will exclude the largest of fish. The turbine design is expected to result in 90% survival in fish greater than 500 mm in length.	• Given that most adult lake sturgeon can be expected to pass through the trash racks, and that most of these will be in the 800 to 1200 mm range (considerably larger than 500 mm), and given that in general the risk of injury is greater for larger fish, can it really be expected that a considerable portion of these (very important) individuals will not be injured or killed? • Given that this proportion is unknown, please give detailed information on the planned monitoring program for establishing injury and mortality rates for large fish that are expected to pass through the trash racks.	CAC-0036	The strategy chosen by the proponents for downstream passage of fish is via the turbines and spillways. Although efforts can (and have) been made to design these structures to minimize injury and mortality to fish, the bottom line is that they are not actually meant to safely pass fish downstream. That said, a survival rate of 90% for fish smaller than 500 mm (a number determined by relatively rigorous empirical experimentation) seems reasonable, given that this size would encompass most of the range for most of the "non-sturgeon" VEC species, northern pike being a notable exception. The strategy also seems reasonable, given that there are decent numbers of non-sturgeon VEC's in the affected area. However, the same cannot be said for lake sturgeon. Literally all of the spawning adults that encounter the turbine intakes will be passed through and potentially killed at an expected (not empirically determined for sturgeon) rate as high as 45% and potentially more for large spawning-sized fish. In addition, there is a great degree of uncertainty associated with almost all aspects of this mitigation strategy. Work at Slave Falls suggests that adult lake sturgeon can be expected to encounter the upstream side of a dam and become entrained; however, factors that impact this proportion are unknown and encounter rates are likely quite variable. The probability of trash rack impingement is unknown (just because a fish will fit between the bars doesn't automatically mean they will pass through the trash rack), as is the fate of impinged fish, as is the true injury and mortality rate of lake sturgeon passing through the turbines. Much of the same can be said for spillway passage. As such, the planned approach cannot reasonably be called a "safe passage" strategy for adult lake sturgeon. It is more like a mitigation program for entrainment. • In any case, the issue that really needs to be addressed is that, given the above arguments, are the risks and uncertainties worth the "reward" (i.e. downstream passage)? Are the benefits of passing lake sturgeon downstream worth the risks in this severely depleted population? • These questions lead to a more basic question. What are the benefits of providing downstream passage? • The response to CEC-0031 included the statement "The study (carried out by the fish passage team) concluded that as a result of high uncertainty associated with the success of current downstream passage options, and because the Keeyask turbine designs had been modified to reduce mortality rates of fish passing through them, the best available approach to downstream fish passage would be through the turbines (and spillway, when in operation)." Was there any discussion as to whether downstream passage was really needed for all the species? • Given that adult lake sturgeon are by far the most at risk to be injured or killed via entrainment or impingement, is it not more reasonable to selectively exclude them by reducing bar spacing in the trash racks and/or installing species-specific structural or behavioural guidance systems? • Cannot connectivity (for whatever it might be worth) for this species be maintained simply by manually moving a few adults downstream yearly during the existing trap and transport program? This would conceivably result in the lowest chance of adult mortality (~0%) and the highest (~100%) chance that migration would not only occur in one direction. The proponents are asked to comment in detail on the above discussion.	CEC RD 2 CAC-0153	CAC-IR Round 2-43

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CAC	R-EIS Guidelines	Keeyask Lake Sturgeon Stocking Strategy	27	Aquatic Environment	"It is important to note that lake sturgeon year class strength and the proportion of hatchery-reared versus wild fish that comprise each year class will be monitored annually."	If it is decided that an evaluation of the success of larval stocking cannot be realistically monitored, should they ever be used in stocking, given that it will not be possible to distinguish a wild fish from one that was stocked as a larva?	CAC-0040	<p>More clarification is needed regarding the use of larval lake sturgeon in the proposed mitigative stocking program. Although research into the issue of identifying wild and stocked fry and fingerlings is a worthy endeavour, it is highly unlikely to produce usable results for larval fish. Isotopic differences will NOT be apparent because the food source for both wild and domestic fish will be the same (i.e. the yolk sac). And, even if there were isotopic differences at stocking, they would be completely masked in an older fish. If stable isotopes are a promising avenue of investigation for identifying hatchery fish, more information on how this might occur is needed. Furthermore, the proponents suggest that "wasting" fish by euthanizing them does not make sense, and I would agree. But I would also strongly suggest that stocking them with a low chance of being able to identify them with certainty makes even less sense if year class strength and (more importantly) the relative contribution of stocked fish to the population is to be evaluated. Essentially, this evaluation cannot be made if fish are being introduced that cannot reliably be identified as wild or hatchery, which is a serious problem for the evaluation process.</p> <p>Money spent on genetic tests would be better spent on rearing more fish to a larger size, while excess fish could easily be stocked in other areas of the province where stocking has been done without regard for genetic source (e.g. Assiniboine River).</p> <ul style="list-style-type: none"> The proponents are asked to comment in detail on the suggestion that: Although research into the issue of identifying wild and stocked fry and fingerlings is a worthy endeavour, it is highly unlikely to produce usable results for larval fish. Isotopic differences will NOT be apparent because the food source for both wild and domestic fish will be the same (i.e. the yolk sac). And, even if there were isotopic differences at stocking, they would be completely masked in an older fish. . . . Stocking them with a low chance of being able to identify them with certainty makes even less sense if year class strength and (more importantly) the relative contribution of stocked fish to the population is to be evaluated. Essentially, this evaluation cannot be made if fish are being introduced that cannot reliably be identified as wild or hatchery. Please provide your views on the suggestion that: ...significant emphasis should be put on holding as many fish as possible through the winter. Fall stocking involves placing very small fish (~15 cm) in resource scarce habitat that will remain so for many months. Stocking programs in the south (e.g. Wisconsin) are poor comparisons because fish in the fall are much larger (~25 cm) and the habitat more productive. Sturgeon stocked in the spring will be larger and they will be stocked into much more productive habitat, and success will reflect this. Please provide your plans for initial proportions of yearling and fingerling stocking and plans to maximize that proportion (if any) for the former group. 	CEC Rd 2 CAC-0154	CAC-IR Round 2-44
								<p>Given the importance of stocking to the overall mitigation strategy for lake sturgeon, the best possible program should be employed. The best programs involve stocking the largest fish possible, and marking ALL stocked fish with long term individually identifiable tags like passive integrated transponders. This allows for a rigorous evaluation of the program and an indication of relative contribution from wild and hatchery sources. The least effective hatchery program involves stocking small fish that cannot be tracked, meaning that it is always uncertain whether or not the program is working. Clearly, some programs fall in between these extremes.</p> <ul style="list-style-type: none"> Please comment on this suggestion that the proponents build a program with two priorities: <ul style="list-style-type: none"> 1. stock the largest fish possible and emphasize practices and research programs that facilitate this goal and 2. mark all stocked fish such that they can be positively identified over the long term for evaluation purposes. 	CEC Rd 2 CAC-0155	CAC-IR Round 2-45
CAC	R-EIS Guidelines	Keeyask Lake Sturgeon Stocking Strategy	N/A	Aquatic Environment	Stocking is the key mitigative strategy proposed by the proponent to offset lake sturgeon losses due to the Project and bolster the populations. The proponents should be commended for the scope of the research that has been invested in, and in terms of their willingness to incur costs associated with rearing lake sturgeon. However, the proponents have understated the difficulties associated with rearing this species in Manitoba, even once the obstacles of getting viable gametes has been surmounted. Although lake sturgeon appear easy to rear in facilities like the White Rose Hatchery in Wisconsin, the hatchery workers at Grand Rapids (and others who have tried), even with years of experience, will readily admit to massive and inexplicable die offs of fish without warning. Survival rates have been wildly erratic over the past decade and complete losses of cohorts have not been uncommon.	Please comment on the uncertainty associated with rearing success of lake sturgeon, and how that relates to stocking as a mitigative strategy.	CAC-0041	Given the acknowledged uncertainties and challenges associated with lake sturgeon rearing, do the proponents have a plan to deal with a worst case scenario (i.e. several or many consecutive years of rearing failure)?	CEC Rd 2 CAC-0156	CAC-IR Round 2-46
CAC	R-EIS Guidelines	Appendix SC-1-4, Human Health Risk Assessment	N/A	Socio-Economy	The results of the HHRA present risk quotient values above 1 and indicated that Manitoba Health and Health Canada have committed to working with the KCN and Manitoba Hydro on consumption advisories in a separate process. In addition, Section 7.2.1 in the Fish Quality assessment indicated that mercury concentrations can remain above preimpoundment levels for 20-30 years.	Are Manitoba Health and/or Health Canada committed to issuing consumption advisories for up to 30 years?	CAC-0024a	<p>Often Aboriginal cultures believe that the benefits gained from consumption of traditional foods are far greater than the possible health effects that may result from eating contaminated traditional food.</p> <p>Has this issue been raised in consultation activities? If so, what mitigation measures are proposed to manage this potential health conundrum?</p>	CEC Rd 2 CAC-0157	CAC-IR Round 2-47
CAC	R-EIS Guidelines	Appendix SC-1-4, Human Health Risk Assessment, Table 5-2	N/A	Socio-Economy	Table 5-2 presents the risk estimates for present conditions from consumption of fish for various fish size classes. The risks are based on a fixed consumption rate for each receptor group (i.e., toddler, child bearing woman and adult male) assessed in the HHRA.	Is it reasonable to assume that the risk estimates presented in Table 5-2 are representative of all individuals in the KCN community or are there portions of the community where risk estimates are predicted to be lower or higher?	CAC-0020a	<p>It is stated that "fish consumption advice from Manitoba Health and Health Canada should address issues related to these circumstances".</p> <p>Please elaborate on how Manitoba Health and Health Canada fish consumption advice "should address" these issues, considering that HQs in Gull Lake for assumed (not maximum possible) intakes are already 14.2 (i.e. tolerable intake is already exceeded by 14.2 times)?</p>	CEC Rd 2 CAC-0158	CAC-IR Round 2-48
CAC	R-EIS Guidelines	6.2.3.4.2 Terrestrial Ecosystems and Habitat	6-93	Terrestrial Environment	Zone 6 is deemed the Regional Study Area (RSA) for caribou, but Zone 5 is the RSA to estimate intactness, even though caribou are identified as particularly sensitive to fragmentation (Response to EIS Guidelines, p. 6-93). Given that the extent of these two zones differ substantially, the results for intactness at a regional scale are not wholly applicable to caribou.	Please provide an estimate of proportion of the area undisturbed in Zone 6 (the Caribou RSA) following the Environment Canada protocol for boreal caribou – i.e., after subtracting burns (40 or 50 years old), linear features and other anthropogenic disturbances, buffered by 500 m, while not removing waterbodies.	CAC-0005	<p>"Please refer to the responses to CEC Rd 1 CEC-0021, Table 6 on Caribou, and CEC-Rd 1-CEC-0037a for detailed information concerning Study Zones 5 and 6, based on the Environment Canada protocol for boreal caribou."</p> <p>It is widely recognized that the boreal forest is dynamic – a landscape driven primarily by wildfires. This imparts some uncertainty to forecasts of population persistence for caribou based on the relationship between recruitment and proportion of the range disturbed (CEC Rd 1 CEC-0021 and CEC-0037a). As noted by Environment Canada (2011), these stochastic effects can be assessed with a habitat-dynamics model, but such models require more detail about the fire regime than is provided by the EIS (Terrestrial Environment, Habitat & Ecosystems, 2.5.3.2).</p> <ul style="list-style-type: none"> Please provide a table of the annual area burned in the Regional Study Area (Zone 6), 1979-2008. 	CEC Rd 2 CAC-0159	CAC-IR Round 2-49
CAC	R-EIS Guidelines	Appendix SC-1-4, Human Health Risk Assessment, Table 5-2	N/A	Socio-Economy	Table 5-2 presents the risk estimates for present conditions from consumption of fish for various fish size classes. The risks are based on a fixed consumption rate for each receptor group (i.e., toddler, child bearing woman and adult male) assessed in the HHRA.	Is it reasonable to assume that the risk estimates presented in Table 5-2 are representative of all individuals in the KCN community or are there portions of the community where risk estimates are predicted to be lower or higher?	CAC-0020a	<p>It is stated that "it is possible that individuals could intake greater amounts of mercury than assumed in the HHRA".</p> <ul style="list-style-type: none"> Since the goal of the HHRA is to protect all individuals, what is the maximum possible intake of fish by an individual and what HQ value is predicted at this maximum possible intake? 	CEC Rd 2 CAC-0160	CAC-IR Round 2-50

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CAC	R-EIS Guidelines	Appendix 5C, Human Health Risk Assessment, Section 5.2	N/A	Socio-Economy	Table 5-1 presents the risk estimates for fish consumption. The hazard quotient for walleye for women of childbearing age is presented as 4.7 for the present conditions in Stephens Lake (Table 5-1). However, based on the measured mercury concentration in walleye of 0.29 ppm (Table w3-1), body weight of 60 kg, serving size of 400 g, consumption frequency of three times per week (Table 4-1), and tolerable daily intake of 0.2 ug/kg/day (Section 4.4.), the hazard quotient should be 4.1.	Please explain this discrepancy. Also, please confirm that the other hazard quotients are correct.	CAC-0032	It stated that "an early draft of the HHRA used slightly higher estimates of methyl mercury concentration in fish from Stephen Lake". This resulted in a loweing of the HQ of 4.7 to 4.1 • Explain why methyl mercury concentrations and associated HQ value were reduced in the final HHRA.	CEC Rd 2 CAC-0161	CAC-IR Round 2-51
CAC	N/A	N/A	N/A	Aquatic Environment		a. Does Manitoba Hydro know the mercury levels in plant, fish and other biota in Stevens Lake before and after it became a reservoir, including through the last 30 years? b. What effect on the fishery does Manitoba Hydro expect from Gull Lake becoming a reservoir? Is Gull Lake fishery already affected by mercury? c. Most of the data on this page is 20 or 30 years old. Does Manitoba Hydro have more recent data regarding mercury in the Nelson River, in the RSA and LSA? In the two Lakes one that is a reservoir and one that will become a reservoir? d. d. Figure 6 – 7 shows mean mercury concentration in fish in Stephens Lake 1970 – 2005. Does Manitoba Hydro have data for fish harvest, fish population for the same three species over the same period of time in Stephens Lake? Will Manitoba Hydro make that information available?	MB Wildlands-0044	It is stated that maximum methyl mercury concentrations in walleye and northern pike are predicted to increase substantially over existing concentrations, to 1.0 ppm or higher. • Please identify how much higher than 1.0 ppm methyl mercury concentrations may increase. • Please revise the HHRA accordingly, as a maximum concentration of 1.0 ppm was assumed.	CEC Rd 2 CAC-0162	CAC-IR Round 2-52
CAC	R-EIS Guidelines	8.0 Monitoring and Follow-up	N/A	Response to EIS Guidelines	Experimentation is considered to be at the core of Adaptive Management (AM). That is, actions should be designed to test ideas about the behaviour of an ecosystem impacts by human use. The literature identifies two types of purposeful experimentation: passive AM, and active AM. Passive AM is should desired objectives not be met, one remediation is proposed, implemented and evaluated at a time. Active AM focuses on deliberately probing the system to test competing hypothesis, by implementing more than one strategy concurrently. Section 8.6 outlines examples of predetermined AM measures.	• To what degree will active AM be employed? • Can you provide examples of potential active AM strategies. A. For example, are there several competing prescriptions for vegetation rehabilitation that would be employed should the terrestrial habitat not respond to the EIS mitigation measures? B. For example, are there competing designed for lake sturgeon spawning structures that might be employed should the structure not be as effective as anticipated?	CAC-0062	CAC-0062 focused on the overall concept of Adaptive Management (AM), and asked Manitoba Hydro to (i) explain the degree to which AM will be employed, and (ii) provide examples of potential active AM strategies. The response recognized that "experimentation is a valuable tool...[and noted that] Manitoba Hydro investigates current and emerging technology and research conducted by other on alternative techniques. In addition, Manitoba Hydro invests considerable resource in funding research and development programs..." Please provide additional information. Specifically: (a) Please give examples <thematic areas, not specifics> where Manitoba Hydro is investigating emerging technology or alternative techniques (b) Please provide a list of research funded by Manitoba Hydro over the last five years, including both the dollar amount and thematic area.	CEC Rd 2 CAC-0163	CAC-IR Round 2-53
CAC	R-EIS Guidelines	8.0 Monitoring and Follow-up	N/A	Response to EIS Guidelines	The Joint Keeyask Development Agreement (JKDA) provides for a Monitoring Advisory Committee (MAC). The Terms of Reference for this Committee are described in Schedule 4-7 of the JKDA. In addition to providing a means of communication with KCNs (2a), the MAC will "provide input into monitoring activities and planning" (2(b) (ii)). Section 8 of the Response to EIS Guidelines notes that through the MAC, the Keeyask Cree Nations "will be actively involved in the development of scientific monitoring programs in the Partnership." The response to information request CAC-001 notes that "KCNs will play a role in monitoring and follow-up plans (including ATK) through mechanism established through governance structures of the JKDA"	Should KCN request a report be issued to the General Partner (and thus appended to the board of the General Partner) as per section 9, what, if any, is the process for resolving outstanding concerns?	CAC-0063b	CAC-0063 b seeks clarification regarding the process for resolving concerns. The response to this question notes that "concerns forwarded by MAC to the Board will be discussed and addressed by both the KCNs and Hydro." • In the event that an outstanding concern is not addressed by the KCNs and/or Hydro in a satisfactory manner, what is the process for resolving outstanding concerns? For example, is there a process for mediation? If so, what are the provisions for mediation (including bringing forward a concern, funding mediation, binding decisions, etc). If there is no plan for mediation, what recourse is available in the event of an unsatisfactory means of resolution?	CEC Rd 2 CAC-0164	CAC-IR Round 2-54
CAC	R-EIS Guidelines	8.0 Monitoring and Follow-up	N/A	Response to EIS Guidelines	The Environmental Protection Plan for the Bi-Pole III Project included: 1. An Environmental Protection Information Management System (EPIMS): an electronic system for compiling and managing results of environmental monitoring; and 2. A community liaison (in addition to an environmental monitor) who would be on-site 1-2 days per week during construction. However, I could not find reference to either in the Environmental Protection Program for Keeyask.	Does the Environmental Protection Plan for Keeyask include the use of an EPIMS?	CAC-0065a	Recommendation 12.1 requests that, "on completion of the Bipole II Project, [Manitoba Hydro] undertake a third-part environment audit to assess the accuracy of assumptions and predictions...[and furthermore the results of the audit] be made public. This is to be repeated five years after the first environmental audit." • Will Manitoba Hydro commit to an external audit for the Keeyask project five years after construction, and make the finding publicly available? If not, please explain how the current management systems provides for similar levels of impact verification and public accountability. For example, will the unnamed data management system described in CAC-0065a be publicly accessible? Recommendation 12.2 requests that, "Manitoba Hydro develop and maintain, in perpetuity, an easily accessible Project-related website to contain all of the information related to monitoring and assessing environmental mitigation and management..." Will Manitoba Hydro commit to a publicly available database contacting similar information for the Keeyask project? For example, will the unnamed data management system described in CAC-0065a be publicly accessible? If not, please explain how the public will access information about mitigation and monitoring. Recommendation 12.3 directs Manitoba Hydro to provide "the Manitoba Government and annual report ... containing information in such detail that past, current and future assessments can be made as to the accuracy of predictions, success of mitigation actions and commitment to future actions... These reports will be made public." Will Manitoba Hydro commit to a similar annual report? If not, please explain how this type of information will be presented to the public in a timely manner. For example, will the unnamed data management system described in CAC-0065a be publicly accessible?	CEC Rd 2 CAC-0165	CAC-IR Round 2-55
							CAC-0065b	CAC-0065b seeks clarification regarding job positions associated with the EPP, including the "environmental monitor" and "community liaisons" created for the Bi-Pole III project. The response notes that while the positions are different, the environmental monitors are to be community members. KCNs will be involved in ATK monitoring, and members of the Monitoring Advisory Committee. Will community members employed in these positions be permitted to share information with the community or will they be required to report findings only to the proponent? In other words, are these community members who are undertaking a role in monitoring, or are they employed in monitoring who are community members?	CEC Rd 2 CAC-0168	CAC-IR Round 2-58

Department	Volume / Document	Line Number / Table Number / Figure Number	Page	Topic	Context / Preamble e.g., provide applicable background/rationale for providing the comment	Specific Department Comment / Request for Additional Information:	Round 1 Proponent Response	Round 2 Intervenor Question	Round 2 Response #	original intervenor IR#
CEC	PE SV	4.0 Surface Water and Ice Regimes	N/A	Physical Environment		<p>With respect to The report, Keeyask Generation Project - Physical Environment Supporting Volume - Surface Water and Ice Regimes, June 2012 was published in 2012 and Open Water Mainstream Travel Time.</p> <ul style="list-style-type: none"> First paragraph (page 4-34): "Travel times for flows along the mainstem [...] ranges from approximately 10 hours to 20 hours." Where do these results come from? From the 2D model? Details about the method used to assess these travel times should be provided. Second paragraph (page 4-21): "The flood of record (post-CRD) occurred in 2005 [...] while the drought of record was found to be 2 years earlier in 2003" How would flow data from 2006 and beyond (period not included in the analysis under review) compare with those flow records? According to these values, record flood and drought were broken during the last ten years. This should be commented versus climate changes and observed hydrologic trends. Is the second assumption (page 4-12) still valid in this context? Figure 4.3-1 (page 4-22) Do the values shown correspond to average annual flow? 	CEC-0063	<p>Preamble</p> <p>Like the Environmental Protection Program described by Manitoba Hydro, we have distilled the adaptive management cycle to four phases: plan (and hypothesize), do (and monitor), evaluate (and learn), and adjust (as needed or desired). A critical component of each phase is ensuring there is adequate capacity associated with the program. To that end, this group of questions focuses on financial capacity.</p> <p>Question</p> <p>(a) What funds have been allocated to implement the four monitoring plans?</p> <p>(b) What level of funding is associated with each phase of the plan (preconstruction, construction, initial operation and long-term operation)?</p> <p>(c) What is the process for increasing funding (which is important given that it is anticipated that monitoring will be reduced during long-term operations? (e.g. Physical Environment Monitoring Plans, p.1-5)</p> <p>(d) Should there be a dispute between the Monitoring Advisory Committee (MAC) and the Board over funding, how will this dispute be resolved? <In the event that an outstanding concern is not addressed to the satisfaction of the MAC, what is the process for dispute resolution over funding?</p>	CEC Rd 2 CAC-0169	CAC-IR Round 2-59
								<p>Preamble</p> <p>The monitoring plans are provided in draft format, as they should be given the uncertainties related to the outcome of the assessment, and temporal unknowns associated with the degrees and types of long-term monitoring required. That being said, it is important to understand the process through which the decisions will be made. The monitoring plans indicate that "any adjustments would be discussed with the MAC" (e.g. Physical Environment Monitoring Plan P. 1-6)</p> <p>a) Will the MAC be financial resources to engage independent technical expertise to review recommendation of Manitoba Hydro? If so, how would the topic areas and levels of funding be negotiated? In the event that the MAC does not agree with the proposed adjustments, would dispute resolution be facilitated through the Board (as per response to CAC-0063b)?</p> <p>b) Following the line of questions in CAC-IR Round 2-54, what are the provisions for resolution should the outstanding concerns not be addressed to the satisfaction of the MAC? <eg mediation></p> <p>c) How will the regulator(s) and the public be involved in decisions to adjust monitoring plans?</p> <p>d) Outside the MAC, how will changes to monitoring plans be communicated with the public? Will these be communicated as needed, annually, at each distinct phase?</p> <p>e) What is the anticipated time period for re-evaluating monitoring plans during the first three phase of the project (pre-construction, construction, initial operation and long-term operation)? <For the long-term operation, is it 10 years, as suggested in Physical Environment Monitoring Plan p. 1-7?> In your response, please backcast the timing between review of results; reviewing feedback from the MAC, regulators and public; refining plans; presenting the revised plans to the MAC for discussion; implementation; and communicating changes.</p>	CEC Rd 2 CAC-0170	CAC-IR Round 2-60
CAC	R-EIS Guidelines	Section 4	N/A	Response to EIS Guidelines	<p>The impact statement notes, in several locations, that Manitoba Hydro's EMS system is ISO 14001 registered, and it anticipates that this project will be included in that registration (eg., Project Description 4-11; Response to EIS Guidelines 4-49; 8-1). For example, certification is cited as evidence of Hydro's "continual improvement of environmental performance." (Response to EIS Guidelines 8-1)</p>	<p>Please explain how certification demonstrates continual improvement of environmental performance, with specific examples.</p> <p>Please include a copy of the most recent ISO-14001 audit. If this is not possible, please summarize the outcomes of this audit, including areas where improvement was suggested.</p>	CAC-0064	<p>The Partnership cites ISO 14001 certification as evidence of continual improvement of environmental performance. (Response to EIS Guidelines 8-1). Yet, in its response to CAC-0064, it declines to provide a copy of its most recent audit. The auditor also has advised that it is not prepared to provide a summary of the audit. An Examination of the Customer Service and Distribution Business Unit's Environmental Compliance Management Process at Manitoba Hydro (Rezai Thesis, August 2012) suggests need for improvement in i) accountability and responsibility ii) stronger monitoring systems iii) training and iv) communication.</p> <ul style="list-style-type: none"> Can we agree that certification by itself, in the absence of information about certification, including the benchmark, areas of strength and limitations provides limited insight into environmental performance? Please explain your answer. Please explain the selection of the older ISO 14001 standard as compared to other possible CSR systems such as Global Reporting Initiative Electrical Utilities Guidelines or the International Hydropower Association "Hydropower Sustainability Assessment Protocol." Is there agreement with the conclusions of the Rezai Masters Thesis that there is need for improvement in i) accountability and responsibility ii) stronger monitoring systems iii) training and iv) communication. If not, please explain your answer. 	CEC Rd 2 CAC-0171	CAC-IR Round 2-61
								<p>Although the proponent has stated that the ISO-14001 audit is subject to a confidentiality agreement, if the proponent intends to rely on the ISO-14001as evidence of continual improvement could it provide a general overview of areas where it has demonstrated continued improvement and areas where improvement was recommended?</p>	CEC Rd 2 CAC-0172	CAC-IR Round 2-62
CAC	R-EIS Guidelines	8.0 Monitoring and Follow-up	N/A	Response to EIS Guidelines	<p>Experimentation is considered to be at the core of Adaptive Management (AM). That is, actions should be designed to test ideas about the behaviour of an ecosystem impacts by human use. The literature identifies two types of purposeful experimentation: passive AM, and active AM. Passive AM is should desired objectives not be met, one remediation is proposed, implemented and evaluated at a time. Active AM focuses on deliberately probing the system to test competing hypothesis, by implementing more than one strategy concurrently.</p> <p>Section 8.6 outlines examples of predetermined AM measures.</p>	<p>To what degree will active AM be employed?</p> <p>Can you provide examples of potential active AM strategies.</p> <p>A. For example, are there several competing prescriptions for vegetation rehabilitation that would be employed should the terrestrial habitat not respond to the EIS mitigation measures?</p> <p>B. For example, are there competing designed for lake sturgeon spawning structures that might be employed should the structure not be as effective as anticipated?</p>	CAC-0062	<p>The original question asked was: To what degree will active AM be employed? Can you provide examples of potential active AM strategies A. For example, are there several competing prescriptions for vegetation rehabilitation that would be employed should the terrestrial habitat not respond to the EIS mitigation measures? B. For example, are there competing designed for lake sturgeon spawning structures that might be employed should the structure not be as effective as anticipated?</p> <p>The proponent did not appear to address in detail the question (B) related to competing designs for lake sturgeon spawning structures that might be employed should the structure not be as effective as anticipated. Please address this question in detail .</p>	CEC Rd 2 CAC-0173	CAC-IR Round 2-63
Environment Commission										
CEC	R-EIS Guidelines	Executive Summary	N/A	Aquatic Environment		<p>A statement is made in the Executive Summary that fish passage will be provided to maintain connections among fish populations. This does not seem to be accurate. How will this be accomplished, specifically? Please comment.</p>	CEC-0026	<p>There is a need to consider downstream fish passage facilities in the design stage including a fish bypass. The discussion on pg 4 last paragraph of the Response indicated that if "all of DFO's management objectives can be met and ongoing productivity can be supported without the installation of fish passage facilities, DFO will not require the installation of these facilities as part of the proposed development". This is different from the Response on CEC-0031 which states "Due to the technical difficulty and high cost associated with designing a downstream fish pass system into the station itself, a downstream bypass within the station will not be considered for this Project" (pg 17-18 last sentence). Our concern is that if a bypass structure and angled screens are not considered during the planning stage it may too costly to install after the facility is constructed. Please explain the apparent discrepancy.</p> <p>Disagree with the statement that angled screens are an experimental approach. In addition to the Menominee River, angled screen technology is being used in US north-east for a variety of species.</p>	CEC Rd 2 CEC-0091	CEC-IR-091

Department	Volume / Document	Line Number / Table Number / Figure Number	Page	Topic	Context / Preamble e.g., provide applicable background/rationale for providing the comment	Specific Department Comment / Request for Additional Information:	Round 1 Proponent Response	Round 2 Intervenor Question	Round 2 Response #	original intervenor IR#
CEC	PE SV	N/A	N/A	Physical Environment		<p>Several hydraulic models (1D, 2D, 3D and physical models) were developed by Manitoba Hydro to simulate the hydraulic conditions of the Nelson River between Split Lake and Stephens Lake.</p> <p>Very few details are provided about the calibration of these models. Water level tolerances and overall water level absolute differences are included for 1D and 2D models. No specific calibration results are provided in the form of tables or figures to compare the measured data with the computed data within the study area. In addition, the scenarios used for the calibration of the various models are not defined. Therefore, there is not enough information in the report to properly assess the validity and accuracy of the flow calculations.</p> <p>Appendix 4B briefly describes the numerical and physical models used. However, the information does not permit an assessment of the models quality. The number and location of the 1D cross-sections, for example, are not provided, nor a map. Also, details about the 2D modelling mesh, such as location map, number of nodes and mesh density, are not included. Several questions about the models are highlighted below.</p> <p>Multiple channels reaches (Caribou Island and Gull Rapids) were modelled in 1D and large water level differences (0.3 m) were provided as results. This is not surprising due to the complex hydraulic conditions on those reaches, which cannot be reproduced by a 1D model. These reaches should have been modeled in 2D.</p> <p>The results of 2D simulations of the Construction Design Flood (CDF) during Stage II Diversion show very high flow velocities (up to 12 m/s) downstream of the spillway. Mitigation measures should be planned to limit erosion and potential damage to the downstream structures.</p> <p>APPENDIX 4B-1 ONE-DIMENSIONAL OPEN WATER MODEL – HEC-RAS (PAGE 4B-1)</p> <p><input type="checkbox"/> Cross-sections</p> <ul style="list-style-type: none"> - How many cross-sections are included in the model? - A location map of the numbered cross-sections should be provided. - A transversal profile of each individual cross-section should be provided. <p><input type="checkbox"/> First paragraph (page 4B-1): "These one-dimensional models can be used to effectively simulate open-water hydraulic conditions for a range of flow between 1,000 m³/s to 6,000 m³/s as this is the range of flow the models were calibrated to."</p> <ul style="list-style-type: none"> - With what real values (not rounded numbers) were the models calibrated? - The results of all calibration scenarios should be presented in order to show the validity of the model. Computed water levels should be compared with measured water levels and presented in the form of a table or longitudinal river profile plot. - The Construction Design Flood (CDF: 6,358 m³/s) is out of range. Does this mean that the results of the simulations of the CDF are not valid? <p>APPENDIX 4B-2 TWO-DIMENSIONAL OPEN WATER MODEL – MIKE 21 (PAGE 4B-2)</p> <p><input type="checkbox"/> Model mesh (unstructured triangular elements)</p> <ul style="list-style-type: none"> - Details about the modelling mesh should be provided, i.e.: <ul style="list-style-type: none"> - Number of elements/nodes; - Mesh density by zones. - Maps of the 2D mesh: a general view and closer views next to Keeyask GS structures should be provided. - Was the model designed to represent the flow conditions only upstream of the future structures (intake and spillway)? - A figure similar to figure 4.4-9 should be presented for the velocity distribution in the north channel (future conditions). <p><input type="checkbox"/> Second paragraph (page 4B-2): "simulated water levels matched rating curves based on measured water levels within a tolerance of approximately 0.2 m"</p> <ul style="list-style-type: none"> - The results of all the calibration scenarios should be presented in order to show the validity of the model. The computed water levels should be compared with measured water levels and presented in the form of a table, longitudinal river profile plot or 2D layout map. <p>3</p> <p><input type="checkbox"/> Second paragraph (page 4B-2): "For verification, simulated velocities also compared well with measured velocity profiles collected at several specific locations along the reach."</p> <ul style="list-style-type: none"> - More details should be provided, i.e. locations of the verification spots, and comparisons between measured and computed velocities. <p>APPENDIX 4B-3 H01E BACKWATER MODEL (PAGE 4B-2)</p> <p><input type="checkbox"/> The specific need to use the H01E model is not fully explained.</p> <p><input type="checkbox"/> Was the H01E model used simply to validate the HEC-RAS model? HEC-RAS could probably have been used to perform all H01E simulations. In this context, the development of a second 1D model appears redundant.</p> <p><input type="checkbox"/> What was the water level tolerance for the H01E model? Was it the same as in HEC-RAS?</p> <p><input type="checkbox"/> Were the project cofferdams and diversion structures also simulated with HEC-RAS? Why was the H01E model preferred for this task?</p> <p>APPENDIX 4B-4 FLOW-3D MODEL (PAGE 4B-2)</p> <p><input type="checkbox"/> As stated, the FLOW-3D model was used to provide multi-dimensional estimates of flow velocity patterns. However, the extent of the 3D model is not given and the report does not include the model output (no results, no map, and no figures).</p> <p><input type="checkbox"/> The FLOW-3D model probably covers the Gull Rapids area and it was therefore used to design hydraulic structures, such as the spillway. However, this information is not stated clearly in the report.</p> <p><input type="checkbox"/> What was the water level tolerance in the FLOW-3D model?</p> <p><input type="checkbox"/> Was the model compared with the MIKE21 model?</p> <p>APPENDIX 4B-7 PHYSICAL MODELS (PAGE 4B4)</p> <p><input type="checkbox"/> The report does not include model results.</p> <p><input type="checkbox"/> Where were the major differences between the physical and numerical models located? What caused these differences?</p> <p><input type="checkbox"/> What was the water level tolerance in the physical models?</p> <p><input type="checkbox"/> Some river ice processes could have been modelled using the physical model. Was ice included in any way in the physical model?</p> <p>APPENDIX 4B-8 ONE-DIMENSIONAL WINTER MODEL – ICEDYN</p> <p><input type="checkbox"/> As mentioned, the ICEDYN model is a numerical model that is still under development. The model does not reproduce all ice processes, such as ice jams, ice breakups, ice runs, and ice cover cracking.</p> <p><input type="checkbox"/> Was the calibration of the ICEDYN model only based on water level?</p> <p><input type="checkbox"/> Was ice thickness used a calibration parameter? How do measured and modelled ice thicknesses compare?</p> <p><input type="checkbox"/> Was the presence/absence of ice a calibration parameter? How does the presence/absence of measured and modelled ice compare throughout the calibration of winter seasons?</p>	CEC-0058	The response includes a reference about supporting Technical Memorandums (TM). Specific information about hydraulic models is included in Technical Memorandums. 1D : TM GN 9.1.3 and GN 9.1.13 2D : TM GN 9.1.4 ICEDYN : TM GN 9.1.6 and 9.1.7 We don't think these are available in the public documentation. Please provide or point us to where they can be found.	CEC Rd 2 CEC-0092	CEC-IR-092
CEC	PE SV	N/A	N/A	Physical Environment						

Department	Volume / Document	Line Number / Table Number / Figure Number	Page	Topic	Context / Preamble e.g., provide applicable background/rationale for providing the comment	Specific Department Comment / Request for Additional Information:	Round 1 Proponent Response	Round 2 Intervenor Question	Round 2 Response #	original intervenor IR#
CEC	PE SV	4.0 Surface Water and Ice Regimes	N/A	Physical Environment		<p>With respect to the report, Keeyask Generation Project - Physical Environment Supporting Volume - Surface Water and Ice Regimes, June 2012 was published in 2012, there were a number of questions about: data and information sources; assumptions; and, description of numerical models and methods.</p> <p>Data and Information Sources</p> <ul style="list-style-type: none"> •First bullet (page 4-9): "Periodic water levels have been collected [...] at 35 locations" - The 35 locations should be shown on a map. •Second bullet (page 4-9): "Discharge measurements ..." - How were the measurements recorded in winter? - Was the discharge data corrected to take ice effects into account? •Third bullet (page 4-9): "Automatic water level gauge data collected at five locations ..." - These locations should be shown on a map. •Fourth bullet (page 4-9): "Discharge and water level data from the Kettle GS for the period 1977 to 2006" - Is this information the same as that of Environment Canada's station 05UF006 (Nelson River at Kettle GS)? - This information is crucial for surface water analysis. Thus, more detail should be provided about calculation methods and data reliability regarding all flow ranges. - The period after 2006 should be included in the analysis. •Eighth bullet (page 4-9): "Water velocity profiles collected at 36 locations in 2003." - How was this information used in the hydraulic analysis? - Was it used for model calibration? If so, how do data and models compare? - How were the locations selected? - The 36 locations should be identified on a map. •Eleventh bullet (page 4-10): "Hydraulic reports and engineering design memoranda [...] included hydraulics relationships such as stage-discharge and stage-storage curves." - Complete references regarding these reports should be provided. - This information is required to calculate the projects inflows. •Last sentence (page 4-11): "...local knowledge was obtained through presentation and discussion of initial results." - Which local communities were involved and where are they located? - What knowledge was learned from them? - What were the "issues of concerns" related to river flow and river ice? <p>Assumptions</p> <ul style="list-style-type: none"> •Second bullet (page 4-12): "The magnitude and variability of the monthly Project inflow record is assumed to be representative of future monthly Project inflows." - This assumption should be supported by an analysis of years 2006 to 2012. •Fourth bullet (page 4-12): "The current river morphology is assumed to be representative of the river in the future for all hydraulic studies." - This assumption should be supported by sedimentology observations. - Which are the areas where sedimentation is likely to modify the river's morphology and the hydraulic conditions? <p>Description of Numerical Models and Methods</p> <ul style="list-style-type: none"> • Third paragraph (page 4-13): "The accuracy of the numerical models [...] is best quantified by the level of calibration attained for each of the models" - Which calibration scenarios have been used? Were they steady state? - Appendix 4B provides some details about calibration. See comments on pages 11 and 12 of this document. • Third paragraph (page 4-13): "In some locations, such as Gull Rapids area, these differences can be 0.3 m due to the complex hydraulic conditions in this reach" - Is this the calibration result of the 1D HEC-RAS model? - Does the model overestimate or underestimate the water levels? - A 2D model is best suited to represent the flow conditions in multiple channel areas. What water level differences were obtained in these areas with the MIKE 21 model? •Fourth paragraph (page 4-13): "Some differences of up to 2 m exist at certain locations [...] for specific points in time." - Does the model overestimate or underestimate the water levels? - How do these errors affect the overall validity of the model? - Specific conditions leading to differences greater than 1 m should be analysed and discussed. 	CEC-0059	The response includes a reference to specific information about hydrology that is included in Technical Memorandum GN 9.1.1. Please provide.	CEC Rd 2 CEC-0093	CEC-IR-093
CEC	PE SV	4.0 Surface Water and Ice Regimes	N/A	Physical Environment		<p>The report states that river ice processes on the lower Nelson River have been studied for many years by Manitoba Hydro. However, references to support this statement are not provided. In order, to anticipate ice-related issues at Keeyask GS, it would be interesting to detail the lessons learned over the years by Manitoba Hydro at neighbour hydropower sites.</p> <p>Local knowledge and issues of concern regarding river ice was obtained via presentations and discussions with local communities. However, the report does include details on this knowledge and the issues of concern. The numerical model used to simulate ice formation processes is ICEDYN, which is still under development and cannot simulate the processes involved during spring breakup. Very little detail is provided about the model and its calibration. The model was calibrated based on measured water level and very large differences (up to 2 m) were obtained at specific points along the reach under study. The validity of the model regarding other parameters (ice thickness or the presence/absence of ice) does not seem to have been assessed.</p> <p>It is expected that the average thickness of the reservoir's ice cover will be between approximately 0.8 to 1.2 m by the end of winter. This range of ice thickness is low, especially when compared with the operating range of the reservoir (1 m). This situation is likely to promote ice ridging.</p> <p>Results indicate that "velocities will also increase by up to 0.5 m/s or more over existing environment values in the north channel of Gull Rapids as this is where the intake to the powerhouse will be located". In these conditions, the ice cover is likely to be unstable near the intake. The risks associated with this situation require further analysis.</p> <p>As mentioned before, ICEDYN cannot simulate conditions during spring breakup. Therefore, the impacts related to the breakup of an ice jam located at Birthday Rapids have not been assessed. This should be added to the list of residual effects and analysed via an alternative method: either a physical model or a numerical model such as CRISP2D.</p> <p>Specific Comment – References and Documentation</p>	CEC-0062	The Response referred to specific information about ice processes included in Technical Memorandum GN 9.1.6. Please provide.	CEC Rd 2 CEC-0094	CEC-IR-094

Department	Volume / Document	Line Number / Table Number / Figure Number	Page	Topic	Context / Preamble e.g., provide applicable background/rationale for providing the comment	Specific Department Comment / Request for Additional Information:	Round 1 Proponent Response	Round 2 Intervenor Question	Round 2 Response #	original intervenor IR#
						<p>Last paragraph (page 4-5): "ice formation on the Lower Nelson River [...] has been studied for many years by Manitoba Hydro." - Are there references to support this statement? - Based on the lessons learned over the years by Manitoba Hydro (MH), what are the main issues related to river ice and hydropower generation on the Lower Nelson River? - It would be interesting to document historical events of ice problems at MH dams on the Nelson River, such as ice jams that forced flow reduction and ice damages to civil and mechanical structures, e.g. turbines. Specific Comment – Satellite Imagery With respect to ice conditions, third paragraph, second bullet (page 4-8): "satellite imagery" - Typical images would have been interesting in appendix. - Which products were used: name, type of image, resolution? Specific Comment – Reservoir Reach • First paragraph (page 4-91): "The reservoir ice cover will be very similar to the lake ice cover that presently forms on Stephens Lake. It is expected that the average thickness of the reservoir ice cover will be between approximately 0.8 to 1.2 m by the end of winter." - This range of ice thickness is low, especially when compared with the operating range of the reservoir (1 m). This situation is likely to promote ice ridging. Please explain. • Last paragraph (page 4-95): "ICEDYN model cannot simulate the processes involved during the spring breakup period" - How were these processes taken into account in the analysis? - The breakup of an ice jam in Birthday Rapids may create a surge and an ice run. - The propagation of an ice breakup surge should be simulated.</p>				
CEC	PE SV	4.0 Surface Water and Ice Regimes	N/A	Physical Environment		<p>With respect to the report Keeyask Generation Project - Physical Environment Supporting Volume - Surface Water and Ice Regimes, June 2012, we had the following comments on residual effects. • Ice Regime (page 4-108) - The following residual effect should be added: - The breakup of an ice jam at Birthday Rapids may result in the release of a surge. The magnitude, extent, duration and frequency of this phenomenon need to be defined based on additional simulations. • Effect during operation - Downstream of Project Site (page 4-111) - The following residual effect should be added: - The duration and frequency of the dewatering of Gull Rapids Outlet will be increased.</p>	CEC-0061	Based on the Response provided by Manitoba Hydro shouldn't the increase of the dewatering duration and frequency of the outlet of Gull Rapids Creek be added to the list of residual effects (Table 4.4.7 - Summary of Residual Effects)?	CEC Rd 2 CEC-0095	CEC-IR-095
CEC	PE SV	7.0 Sedimentation	N/A	Physical Environment	<p>The Report, "Keeyask Hydropower Limited Partnership, Keeyask Generation Project - Physical Environment Supporting Volume – Sedimentation, June 2012" was reviewed. The report is intended to describe the sedimentation processes operating in the project area and how the baseline environment will change under Project conditions. Some questions and further explanations are required and are identified below.</p>	<p>The stated objectives of the Sedimentation section are: • Characterization of historical and current sedimentation processes (bed material transport, suspended sediment transport, deposition). • Prediction of future sedimentation processes, mineral and organic suspended solids concentrations (nearshore and offshore), sediment transport (mineral and organic) and deposition rates, thickness, and volumes for (1) the construction period, (2) future conditions/trends, and (3) future environment with the Keeyask GS. We have assumed that Item (2), future conditions/trends, refers to projections of what will happen in the future under no-Project conditions. The report and appendices contain considerable qualitative discussion about sedimentation processes and presents the results of the numerical modeling that was conducted to quantify these processes. An extended discussion of the modeling approach is presented in Appendix 7A, along with descriptions of the input data sources and the field data available for calibration. Unfortunately, the bulk of the input data are not provided and the descriptions are not of sufficient detail to perform a thorough review of the underlying models or the methods that were used to apply them. In addition, although the qualitative descriptions of sedimentation processes are generally correct, they neglect key processes that appear to have led to application of the models in a manner that is, at best, confused, and in many cases, may be inappropriate. The objectives include significant emphasis on the transport and deposition of bed and suspended (i.e., mineral) sediment and organic suspended solids; however, the modeling results focus primarily on suspended sediment concentrations. The focus on suspended sediment concentrations is appropriate for assessing water quality impacts; however, this focus is misplaced with respect to potential project effects on channel geomorphology, including bank erosion and in-channel erosion and deposition processes. As noted in Section 7.1.1.1, mineral sediment transport can be divided into two primary categories: • Bed load, or the typically coarsest fraction of the load that moves in contact with the bed, and • Suspended load. A key concept that is not mentioned is the distinction between bed material load and wash load. The failure to recognize this distinction appears to be largely responsible for the inappropriate approaches that were used for significant portions of the analysis. Bed material load refers to the portion of the total load that is made up of particles found in significant quantities in the bed, and it consists of two components: bed load and suspended bed material load (ASCE, 2007; Simons & Senturk, 1992). This portion of the load is primarily responsible for the geomorphic behavior of the channel(s), and it can be quantified using an appropriate equilibrium transport equation with hydraulic conditions estimated through numerical modeling and measured bed material size gradations. The wash load is made up of particle sizes that are not found in significant quantities in the bed (ASCE, 2007; Simons & Senturk, 1992). The wash load consists of particles that are much finer than the typical bed material, in most cases silts and clays, although even sand can fit into this category in coarse-grained rivers with a relatively low sand supply. By definition, the wash load is supply-limited, meaning that the amount being carried by the river at any given location and time is controlled by the supply, and not by the local hydraulic conditions and bed material characteristics. This is the most likely reason that the measured suspended sediment concentrations have poor correlation with instantaneous discharges (p 7-13, last paragraph). Because it is supply limited, the wash load component cannot be quantified with the type of numerical modeling that was employed in this study. Unfortunately, the vast majority of the sediment load that is considered in the study is in the wash load category. Please explain.</p>	CEC-0067a			
								Please see subsequent IR based on Manitoba Hydro Response below. In spite of the discussion of dimensionless parameters, the equations that were used in the modeling are not applicable to the range of sediment sizes that are being modeled. The minimum particle size for all of the equations listed in USBR (2006) Table		

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CEC	PE SV	7.0 Sedimentation	N/A	Physical Environment	The Report, "Keeyask Hydropower Limited Partnership, Keeyask Generation Project - Physical Environment Supporting Volume – Sedimentation, June 2012" was reviewed. The report is intended to describe the sedimentation processes operating in the project area and how the baseline environment will change under Project conditions. Some questions and further explanations are required and are identified below.	Modeling of mineral sedimentation processes was conducted using a range of models, including the two-dimensional (2D) Mike-21 and the 1D HEC-RAS and HEC-6. The algorithms in these models were developed to quantify erosion and deposition of non-cohesive sediment based on mass conservation using semi-empirical sediment transport functions that were primarily developed for sand and coarser material. An important aspect of the sediment transport functions is that they were developed for equilibrium transport conditions; the predicted bed and suspended bed material loads represent the capacity of the river to carry the indicated sizes based on the local hydraulic conditions and bed material characteristics. The Limitations Section (7A1.1.4) discuss issues with simulating transport of cohesive material and includes the following statement: ...limitations of the model in computing relatively fine cohesive material were addressed by applying rigorous calibration procedures to confirm the applicability of the model... This section further states that only 10% to 20% of all suspended sediment has a mean diameter of less than 0.004, which is the upper limit of clay; thus, the majority of the suspended material is non-cohesive and a non-cohesive model formulation was considered to be appropriate and necessary. Unfortunately, the transport equations available in these models are also not applicable for silt that falls in the size range between 0.004 mm and 0.062 mm, and this appears to be the bulk of the material that is transported through the reach. Please explain.	CEC-0067b	3.12 is 0.062 mm (i.e., fine sand), and modeling was conducted for sizes that are mostly in the range from 0.004 mm to 0.062 mm (i.e., silt). This is a serious flaw in the modeling approach because the equations represent equilibrium transport conditions and these finer sizes are being carried at rates significantly lower than equilibrium. Please respond. The method that was used to simulate bank erosion using HEC-RAS is not appropriate. HEC-RAS simulates changes vertical in channel bed elevations based on the imbalance between sediment supply and the cross sectionally-averaged sediment supply using the Exner equation of sediment continuity. Bank erosion occurs through a variety of processes, including grain-by-grain erosion due to shear stresses acting directly on the bank and bank failure due to undercutting and geotechnical failure. Neither process is properly simulated in HEC-RAS. Some of the erosion may erosion be due to grain-by-grain erosion (Case 1), but use of cross sectionally-averaged hydraulic conditions and sediment continuity is clearly not appropriate since this is a very localized process. HEC-RAS does not simulate geotechnical failure, if that is, in fact, one of the processes operating in this reach. Please respond.	CEC Rd 2 CEC-0096	CEC-IR-096
						For the Mike-21 modeling, the upstream boundary sediment concentrations were estimated in Clark Lake using the total load theory of Engelund and Hansen (1967) and ...transport of this sediment load was then simulated by the suspended sediment load theory of Galappatti (1983). The Engelund and Hansen (1967) equation is a semi-empirical bed material load equation that was developed for sand bed streams. This equation is not applicable to the silt/clay fraction (i.e., sizes finer than 0.062 mm). Galappatti (1983) is a numerical method of estimating a first-order adjustment to the sand concentrations derived from equilibrium transport equations to account for the phase-lag between the depth-averaged concentrations and depth-averaged velocities. This method could potentially be applied to the silt fraction, but it requires equilibrium transport conditions in which the suspended sediment load is being carried at capacity based on the hydraulic conditions and bed material sizes, a condition that is almost certainly not met in most, if not all, portions of the study reach. In spite of the calibration efforts, the model does not represent the sedimentation dynamics of the silt/clay size fractions, and the results are therefore not meaningful with respect to the questions that are being evaluated. Please explain. The HEC-RAS model was used to assess ...impacts from construction activities during river management [to predict] shoreline erosion and subsequent sedimentation... (Section 7.2.1.1, 2nd paragraph). Four of the 7 transport equations that are available in the software were used in the sedimentation modeling (Section 7A.2.1.2.1, last paragraph): <ul style="list-style-type: none"> • Ackers and White • Engelund and Hansen • Laursen • Yang (sand). 	CEC-0067c			
						The equations were selected based on their relevance and appropriateness for use on the Nelson River...using hydraulic parameters that ...included the dimensionless particle diameter, dimensionless depth, Froude number, relative shear velocity, unit stream power and sediment load concentration. Neither the values of the parameters for the Nelson River nor the specific basis for concluding that these equations are appropriate were provided. Similar to the above discussion regarding the Mike-21 model, all of these equations were developed to represent the equilibrium transport capacity. Please explain.	CEC-0067d			
						In rivers with fine-grained banks, bank erosion can be an important source of wash load. The study does correctly recognize that bank erosion will contribute to the suspended sediment loads at rates that are directly related to the bank erosion rates. It is noted in the Report that: shoreline erosion was predicted by conducting hydraulic and sedimentation modeling of the existing environments as well as for the different construction stages of the Project...using HEC-RAS 4.0. HEC-RAS 4.0 does not have the capability to model bank or shoreline erosion. Please explain.	CEC-0067e			
						Section 6.2.4 indicates that one of the assumptions used in the modeling is that no catastrophic natural events (e.g., earthquake, flood, land-slides) will occur in the future. This seems like an unrealistic assumption, at least with respect to floods. Please explain.	CEC-0067f			
CEC	AE SV	6.0 Lake Sturgeon	N/A	Aquatic Environment	Cumulative effects with respect to sturgeon do not seem to have been addressed in the EA report which is a significant deficiency. The Nelson River has already been substantially altered by various flow manipulations and developments such as the: Churchill River Diversion; Lake Winnipeg Regulation; construction and operation of the existing hydro facilities (e.g., Limestone, Long Spruce, Kettle, Kelsey) and associated reservoirs on the Nelson; commercial fishing; and possible future facilities (e.g., Conawapa).	It is worthwhile for KHLP to consider advancing Lake Sturgeon into the cumulative effects assessment. Based on a preliminary assessment, we do question whether there will be no adverse residual effects on the Lake Sturgeon population given existing and proposed developments on the Nelson River.	CEC-0027	Response on cumulative effects is inadequate and does not address fish survival through multiple facilities (e.g. Limestone GS, Long Spruce GS, Kettle GS, proposed Keeyask, proposed Conawapa GS). What about entrainment estimates of stocked individuals? Please calculate the expected fish survival of fish through multiple power plants using a broader definition of fish survival to include not only mortality associated with the turbines but also associated with the spillway and tailrace.	CEC Rd 2 CEC-0097	CEC-IR-097

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CEC	AE SV	6.0 Lake Sturgeon	N/A	Aquatic Environment	<p>A number of assumptions have been made regarding shifts in use from areas currently used for spawning, nursery and foraging habitat to other existing habitat or newly created habitat, particularly for spawning, young-of-the-year (YOY) and sub-adults. How confident is KHL that sufficient habitat will be made available for all life stages of Lake Sturgeon? The Aquatic Environment Volume suggests that stocking appears to be the cornerstone of the prediction and that Lake Sturgeon numbers will increase regionally. However, stocking, in the absence of sufficient habitat of suitable quality will not create a viable self-sustaining population. This needs to be better addressed in the report. It would be important for KHL to explain how there can be overall moderate to high certainty assessment for increases in population of Lake Sturgeon when there is a low to moderate statement specifically for YOY habitat? This is based on the following statement in Section 6.4.4.4 of the Aquatic Support Volume (p 6-48). "There is low to moderate certainty regarding the success of mitigation measures to create YOY habitat in the reservoir and moderate certainty regarding the success of mitigation measures to create spawning habitat in the reservoir and Stephens Lake. However, there is moderate to high certainty regarding effects to abundance following implementation of a stocking program, resulting in overall moderate to high certainty for the predicted increases in regional Lake Sturgeon numbers."</p> <p>There seems to be potential for significant loss of Lake Sturgeon habitat. From the MacDonnell thesis, the Kelsey rapids were an important spawning area historically (p. 122 and other around p. 56). Spawning was also reported to occur in the Grass River which appears to enter the Nelson from the west just downstream from Kelsey (and at Witchai Falls p. 122). Also spawning was evident in the Burntwood River and Odei River (Page 51, p. 119). Sturgeon were also abundant in Gull Lake (p. 119).</p>	If future monitoring shows that habitat to support all life stages of Lake Sturgeon is no longer available, replacement habitat will be developed. This assumes that the type of habitat that is missing can be created. How would KHL address this?	CEC-0029	<p>Follow-up question #1 for CEC-IR-029. Could KHL confirm that the predicted "overall moderate to high certainty for the predicted increases in regional lake sturgeon numbers" is based upon to the effects of the proposed stocking program and is not reliant upon successful natural reproduction post-project? Follow-up question #2 for CEC-IR-029. Could KHL indicate if there are examples of creation of young-of-the-year (nursery) habitat for lake sturgeon and, if there are, whether or not they were successful?</p>	CEC Rd 2 CEC-0098	CEC-IR-098	
CEC	AE SV	6.0 Lake Sturgeon	6-38	Aquatic Environment		In this section it is indicated that Lake Sturgeon have been found to limit their movements to relatively short reaches of river even in the absence of physical barriers (READ APPENDIX 6A). Please confirm if this is the intended interpretation?	CEC-0030	We understand new information in Response to this IR is coming in early August. We will wait for new information before considering closing this IR.	CEC Rd 2 CEC-0099	CEC-IR-099	
CEC	AE SV	6.0 Lake Sturgeon	N/A	Aquatic Environment		<p>It is indicated in Appendix 1A- Part 2, page 1 of the Aquatic Supporting Volume that the stocking of Lake Sturgeon is a proven method for increasing numbers and has been an important feature of many recovery plans. It is our opinion that this is likely only true where the habitat still exists and the decline was due to overfishing or pollution that has been rectified. We are not aware that this has been used as a proven mitigation method relative to hydroelectric development. Is there documentation to support this statement (i.e. can KHL provide more details on where stocking has been used in hydroelectric offsets)? Appendix 1 refers to stocking initiatives but none seem to be directed towards hydroelectric plants, and most are short term initiatives (usually less than 10 years not 25 years as proposed by KHL).</p> <p>A concern is expressed that stocking should be the last mitigation option and not the first. A typical "Impact Management Hierarchy" would suggest that a sequential approach would first try to avoid impacts (through re-location or re-design of the project) and where this is not feasible, to mitigate impacts (through use of best available technology and practicable mitigation measures). Failing the availability of measures to mitigate impacts, the last resort is to offset the residual impacts through replacement of the natural capital that is damaged or lost as a result of the development project. It is felt that KHL should consider Best Available Technology (BAT) for fish protection as part of the EIS.</p> <p>A concern is expressed that there should have been more consideration paid to both upstream and downstream fish passage technology and approaches especially for sturgeon. Recent work conducted in the US on diverting downstream migrating sturgeon (e.g., angled bar or trash racks) by the Alden Labs (e.g., Amaral 2008), and on upstream passage at the Conte Labs (e.g., Kynard et al. 2012) are not discussed. Furthermore, recent efforts by the USFWS on both upstream and downstream fish passage facilities for two hydro facilities in WI are also not referenced nor discussed (Utrup 2011). Both upstream and downstream systems proposed have been approved for implementation for Lake Sturgeon protection in WI by the Federal Energy Regulatory Commission (FERC). It is felt that protection options should be considered as part of this EIS rather than a follow-up program after the facility is constructed given the current status of Lake Sturgeon and potential cumulative effects issue which is discussed below. If a simple bypass structure and technology such as angled screens are not considered during the planning stage it may be too costly to install after the facility is constructed. The concern is a fragmented population of Lake Sturgeon on the Nelson River.</p> <p>Therefore, it is requested that KHL provide some further analysis as to the feasibility and efficacy of fish passage technologies.</p> <p>A concern is expressed Recovery means re-establishing a self-sustaining population, and stocking in the absence of suitable habitat will not achieve that.</p> <p>References</p> <p>1). Amaral, S., Taft, N. and D. Dixon. 2008. The Use of Angled Bar Racks and Louvers for Protecting Fish at Intakes. Presentation. A Symposium on Cooling Water Intake Technologies to Protect Aquatic Organisms. Available at: http://water.epa.gov/lawsregs/lawguidance/cwa/316b/upload/2008_06_10_316b_meetings_symposium_amaral.pdf.</p> <p>2). Kynard, B., Pugh, D. and T. Parker 2012. Passage and Behaviour of Cultured Lake Sturgeon in a Prototype Side-Baffle Fish Ladder: I.Ladder hydraulics and fish ascent. Journal of Applied Ichthyology 27(Suppl. 2):77-88.</p> <p>3). Utrup, 2011. (USFWS contact). Final Environmental Assessment. Proposed Upstream and Downstream Fish Passage for Lake Sturgeon at Menominee River in the Cities of Marinette Wisconsin and Menominee Michigan. Prepared for US Department of Interior by NEW Hydro. WI.</p>		CEC-0031	<p>There is a need to consider downstream fish passage facilities in the design stage including a fish bypass. It is indicated that the "best approach to downstream fish passage would be through the turbines (and spillway when in operation)" - pg 17 par 4 line 6. Need to consider not only turbine passage but also spillway and tailrace mortality. In addition to blade strike calculations, need to consider mortality associated with barotrauma related injuries. Use mortality injury simulation statistics developed by Brown et al. 2012 (Trans American Fisheries Society 141: 147-151) as an example.</p>	CEC Rd 2 CEC-0100	CEC-IR-100

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CEC	R-EIS Guidelines	7.3 Past, Current and Future Projects and Activities	N/A	Terrestrial Environment	<p>Attachment E of the Scoping Document for the EA of the Keeyask Generation Project provides a list of past, current and future projects and activities for the cumulative effects assessment (CEA):</p> <p>"The following are past and current (i.e., ongoing) projects and activities to be considered in the cumulative effects assessment:</p> <ul style="list-style-type: none"> Manitoba Hydro generation-related developments in the North: <ul style="list-style-type: none"> Churchill River Diversion Lake Winnipeg Regulation Jenpeg, Kelsey, Kettle, Long Spruce, Limestone and Wuskwatin Generating Stations Kelsey re-running Keeyask Infrastructure Project Linear development in the region (i.e., transmission lines and highways, including upgrades to PR 280) Mining (e.g., Vale) Commercial forestry Commercial fishing of sturgeon Other agents of change as may be identified in the assessment of specific VECs <p>The following are future projects to be considered in the cumulative effects assessment:</p> <ul style="list-style-type: none"> Gillam redevelopment Bipole III Transmission Keeyask Transmission Project Conawapa Generation Project" <p>In Section 9.8 "Cumulative Environmental Effects" of the Canadian Environmental Assessment Agency's Draft EIS Guidelines for the Keeyask Generation Project document, it is stated that:</p> <p>"The proponent shall provide a map that shows all the past, present and future projects it has considered in the cumulative effects assessment."</p> <p>Mapping is provided in Section 7.0 "Cumulative Effects Assessment" in the Keeyask EIS Map and Figure Folio and includes:</p> <ul style="list-style-type: none"> Hydro Development in Northern Manitoba (locations of proposed and existing projects); Wuskwatin Transmission Project; Manitoba Hydro Transmission Line Network; Keeyask Infrastructure Project Site; Provincial Road 280 Upgrade; Northern Extents of Bipole III Transmission Project; Keeyask Construction Power Project: Preliminary Transmission Corridors During Construction; and Keeyask Construction Power Project: Preliminary Transmission Corridors During Operation. <p>Map 7A-6 "Northern Extents of Bipole III Transmission Project" only shows the locations the Keewatinow Converter Station (CS) and the Bipole III Transmission Line (Final Preferred Route). There is no indication of other proposed Bipole III Project components, e.g., Keewatinow Ground Electrode Site, Ground Electrode Line, five AC collector lines from Henday CS to the Keewatinow CS, etc. (see Section 2.0).</p>	<p>A map should be provided indicating the locations of all proposed Bipole III Project components, as well as the proposed Conawapa Generating Station (GS) and its likely project components.</p> <p>Note: The revised map provided by KHLP did not include all of the items identified above. A suggest study zone is shown below.</p>	CEC-0020	<p>In all of the terrestrial VEC sections in the "Cumulative Effects Assessment Summary" a table with the heading "Interaction with Future Projects/Activities" includes "Bipole III" and "Conawapa" as future projects/activities. This is misleading. As "Bipole III" could be interpreted as representing all of the Bipole III Transmission Project (including the Keewatinow CS project components), if should be revised to "Bipole III Transmission ROW". Moreover, as "Conawapa" is outside of the Regional Study Areas (Study Zones 4, 5 and 6 depending upon the VEC) and was not considered in the cumulative effects assessment, it should be deleted from each section of this version of the "Cumulative Effects Assessment Summary". However, see Follow-up to CEC-IR-022, which requests KHLP to expand Study Zones 4 and 5 to encompass all past, current and future developments further east up to and including Conawapa.</p>	CEC Rd 2 CEC-0101a	CEC-IR-101
					<p>In the Ecosystem Diversity section of the "Cumulative Effects Assessment Summary", it is stated that "effects on the amounts of priority habitat affected were considered to be regionally acceptable if they were less than 10% of the pre-development area for the habitat type". It is further stated that based on the anticipated locations of the future projects, cumulative area losses for all priority habitat types are expected to remain below 10% of pre-development area". There is no indication that the cumulative loss of the priority habitat type "balsam poplar dominant on all ecosites" will be 9.9% of Study Zone 5, whereas 8.8% of two other priority habitat types will also be lost. Why was this information not presented?</p>			CEC Rd 2 CEC-0101b		
					<p>In the Rusty Blackbird section, it is stated that this migratory bird "was selected as a VEC primarily because it is listed as threatened under the federal Species at Risk Act." According to http://www.sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=907 Rusty Blackbird is listed as Special Concern under the federal Species at Risk Act not Threatened.</p>			CEC Rd 2 CEC-0101c		
CEC	R-EIS Guidelines	7.5.2 Terrestrial Environment	N/A	Terrestrial Environment	<p>A quantitative residual effects assessment for the Local Study Areas was not provided for some of the VECs and supporting topics. Eastern expansion of the Study Zone 5 Regional Study Area will not affect the EA findings for the Local Study Areas (generally Study Zone 3, but Study Zone 2 for Terrestrial Habitat, Ecosystem Diversity, Soil Quantity and Quality, Wetland Function, Priority Plants and Invasive Plants).</p> <p>For example, it is stated in Section 2.6.4.1.1 of the Terrestrial Environment Supporting Volume that the "Project Footprint could remove or alter up to 6,872 ha, or 0.6% of terrestrial habitat during construction, but this could increase to 6,952 ha if borrow area E-1 is used", or 0.7% of terrestrial habitat in the Regional Study Area (Study Zone 5 with area of 1,240,000 ha). Although not mentioned in Section 2.6.4.1.1, this loss of habitat areas with or without the use of borrow area E-1 would represent approximately 53% of the Local Study Area (Study Zone 2 with area of 13,043 ha).</p> <p>No data on percentage of core areas to be lost were provided for the Local Study Area. Rather, it was indicated in Section 2.4.4.1.1 that the number of core areas at least 200 ha in size that overlap the Local Study Area would decline from 13 to 12 and their combined area would decline from 115,308 ha to 106,754 ha. This is a decline of 7.4%, and would likely be significantly higher if only the areas of the core areas within the Local Study Area are taken into consideration.</p> <p>As stated in Section 6.5.3.3.1 "Construction Effects and Mitigation" of the Keeyask Generation Project EIS Response to EIS Guidelines, "the total number of core areas larger than 200 ha in the Regional Study Area is predicted to remain at 111 because, although a few core areas are completely removed, several other core areas are fragmented into smaller blocks. The total number of core areas larger than 1,000 ha would be reduced by one. None of the very large core areas would be lost."</p> <p>As stated in the Terrestrial Environment Supporting Volume (p. 2-120), "Project construction would have localized core area effects, primarily resulting from reservoir clearing, dyke construction and coffer dam diversion. One core area slightly larger than 1,000 ha and two core areas between 200 ha and 1,000 ha would be removed. In addition, several larger core areas on the north and south sides of the Nelson River would become smaller (Map 2-15). One of these latter core areas is on Caribou Island and is the largest core area on an island in the Keeyask reach of the Nelson River. The largest core area along the north side of the Nelson River would be reduced by 879 ha, or 36%." The total losses of core areas may not be significant within the Regional Study Area, but may be within the Local Study Area. However, no data are provided on percentage of total core area to be lost within the Local Study Area.</p>	<p>A quantitative residual effects assessment of each project component, e.g., reservoir clearing, dyke construction, coffer dam diversion, permanent and temporary infrastructure footprints, reservoir inundation, for the Local Study Area in tabular form and/or mapping, as appropriate, should be provided for each of the key topics:</p> <ul style="list-style-type: none"> Intactness based on linear feature density (km/km2) and core area abundance (number and ha); Terrestrial Habitat based on loss or alteration of terrestrial habitat (ha); Ecosystem Diversity based on loss or alteration of the 43 priority habitat types (number and ha); Wetland Function based on loss, creation or alteration of shoreline wetlands, off-system marsh and other wetland types (ha); Mallard based on loss of habitat and reduction of staging habitat quality (ha); Bald Eagle based on habitat alteration and loss of nests and perching trees (ha and number); Olive-sided Flycatcher based on habitat loss (ha); Rusty Blackbird based on habitat loss (ha); Common Nighthawk based on habitat loss/gain (ha); Yellow Rail based on habitat loss (ha); Short-eared Owl based on habitat loss (ha); Beaver based on habitat loss (ha), colony removal (number) and improved trapping access; Caribou based on loss of significant caribou habitat, and relative to cumulative effects of Intactness, Terrestrial Habitat and Ecosystem Diversity; Moose due to habitat loss and alteration (ha) and increased hunting access; and American Marten based on habitat loss (ha) and Intactness. 	CEC-0021	<p>Please confirm that the major columns with the headings of "Keeyask & past, current & potential future projects Regional Study Area" in Tables 1 and 3, and the heading of "Keeyask & Past, Current and Future Projects" in Table 2, provide data for the portion of the Bipole III transmission right-of-way within the regional study area (Study Zones 4, 5 or 6, depending on the VEC), Gillam Redevelopment and Keeyask Transmission Project as all future projects, in addition to the Keeyask Generation Project.</p>	CEC Rd 2 CEC-0102a	CEC-IR-102
					<p>For the Indicator Measure "total terrestrial habitat area (ha)" under the "Bipole III" column, it is indicated that 3,700 ha will be affected. Footnote 5 states that habitat composition for the 3 portion of Bipole III outside of Study Zone 4 is estimated from Study Zone 4 percentages. In Table 4 of the KHLP response to CEC-IR-035, it is indicated that approximately 3,630 ha of terrestrial habitat will be affected by all of the Bipole III Transmission Project within the Split Lake and Fox Lake Resource Management Areas. This 3,630 ha area includes 1,584.13 ha of transmission line right-of-way (ROW), which can be expected to be similar to the area of transmission line ROW within Study Zone 5. Please clarify whether the 3,630 ha of total terrestrial habitat area represents the area of Bipole III transmission line ROW within Study Zone 5, or the total area affected by the Bipole III Transmission Project.</p>			CEC Rd 2 CEC-0102b		
					<p>Tables 2 and 3 are very confusing. Why were sub-columns with Conawapa and Keewatinow headings included in the tables and in the case of Table 2 provided with values of 0 ha implying that no bird VEC habitat will be affected? Please complete the following simple table:</p> <p>Total Available Pre-development Habitat in RSA Area can be estimated by using the following formula: Habitat Currently Available in the RSA X Total Pre-development Terrestrial Habitat (e.g., 167,255 ha for Study Zone 4) ÷ Total Terrestrial Habitat Lost due to Past & Current Projects.</p> <p>In the Follow-up to CEC-IR-022, CEC requested KHLP to expand Study Zones 4 and 5 to encompass all past, current and future developments located further east up to and including Conawapa. Please include these developments in the preparation of the above table.</p> <p>In addition, please revise Table 1 to include these additional past, current and future developments located further east up to and including Conawapa.</p>			CEC Rd 2 CEC-0102c		

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CEC	R-EIS Guidelines	7.5.2 Terrestrial Environment	N/A	Terrestrial Environment	<p>Section 1.3.5 of the Keeyask EIS Terrestrial Environment Supporting Volume presents the Local and Regional Study Areas, each generally consisting of three Study Zones (see Map 2-1 of the Keeyask EIS Terrestrial Environment Supporting Volume). It was stated that: "Due to the manner in which it was derived, the Regional Study Area was generally used as the cumulative effects assessment area." The Local and Regional Study Areas for many of the VECs and supporting topics were Study Zones 3 and 5, respectively (see Map 1-1, Terrestrial Environment). The east-west axis of the Study Zone 5 Regional Study Area extends from Long Spruce GS to just west of Thompson. The length of the eastern axis from the proposed Keeyask GS to Long Spruce GS is approximately 50 km, whereas the length of the western axis from the proposed Keeyask GS to west of Thompson is approximately 190 km, i.e., 3.6 times longer. For most EAs, the Project Footprint is the centroid for the delineation of its study areas. With the truncation of the Study Zone 5 Regional Study Area at Long Spruce GS, an assessment of the terrestrial environment components further east that have been affected by existing developments or would be affected by future developments was not undertaken. Existing developments outside of Study Zone 5 include (for reference see Map 2 from the BiPole Transmission Project, called "Location of Existing and Proposed BiPole III Developments Outside Proposed Keeyask Project Terrestrial Study Areas"):</p> <ul style="list-style-type: none"> • Community of Bird; • Limestone GS; • transmission lines between Limestone GS and Henday CS; • transmission lines between Long Spruce GS Henday CS; • Henday CS and the northern end of Bipole II; • further northern extension of the KN36 transmission line; • further northeastern extensions of the CN rail line and the abandoned rail line; • further northeastern extension of Highway 290; • Conawapa Road; • access roads and trails; • cutlines; and • cleared, borrow and other disturbed areas. <p>Proposed developments outside of Study Zone 5 include:</p> <ul style="list-style-type: none"> • many of the Bipole III Transmission Project components including: <ul style="list-style-type: none"> o the Keewatinow Ground Electrode Site; o the Ground Electrode Line; o the Keewatinow CS; o most of the AC collector line from Long Spruce GS to Henday CS; o the five AC collector lines from Henday CS to the Keewatinow CS; o the construction power line from Henday CS to the construction camp site; o the start-up and main construction camp sites; o the work area site; o the borrow and excavated material placement areas; o an approximate 60-km section of the Bipole III HVdc Transmission Line from the Keewatinow CS to the eastern limit of Study Zone 5; and • the Conawapa GS, with a smaller inundation area but likely larger construction and infrastructure footprint than the proposed Keeyask GS. <p>It should be noted that there is a westward indentation of Study Zone 5 resulting in additional exclusion of the proposed Bipole III transmission line (see Map below). An extension of the Study Zone 5 Regional Study Area approximately 60 km further northeast would have encompassed these existing and proposed developments (see Map below). There is an inset figure at the top left hand side of Map 1-1 of the Keeyask Terrestrial Environment volume which delineates the Keeyask Generation Project Area, which extends the eastern boundary further east to encompass the existing and proposed developments. A suggested extension of Study Zone 5 to encompass all existing and proposed developments is presented below.</p>	The Study Zone 5 Regional Study Area should be extended approximately 60 km further northeast to encompass the existing and proposed developments listed above. A suggested extension of Study Zone 5 to encompass all existing and proposed developments is presented below.	CEC-0022	<p>During a teleconference call on May 9, 2013 between CEC and KHL P consultants, it was strongly urged that KHL P extend Study Zone 5 Regional Study Area to encompass all existing and proposed developments to the northeast for the terrestrial environment cumulative effects assessment. KHL P indicated that the Study Zone 5 boundary reflected the boundary between two distinct ecoregions: Hayes River Upland to the west and Hudson Bay Lowland to the east. KHL P opined that this ecologically-based boundary encompassed the potential effects of the proposed Keeyask Generation Project as it extended from Thompson where most of the Project-related traffic will originate to Radisson Converter Station, the terminus of the proposed Keeyask Transmission Project. As such, Study Zone 5 provided the basis for the assessment of cumulative effects on terrestrial VECs. The CEC consultant opined that the ecoregion boundary does not define genetically distinct populations of animal VECs, nor preclude their movement from one ecoregion to the other. Therefore, as there will be adverse impacts on populations of specific VECs, e.g., habitat loss, due to the Keeyask Generation Project in the Hayes River Upland ecoregion, there will be additional adverse impacts to these populations in the adjacent Hudson Bay Lowland ecoregion due to the past, existing and future projects within the ecoregion. The combination of adverse impacts in both ecoregions would have a cumulative effect on these populations. KHL P responses to CEC-IR-022 are summarized below, each followed by an additional information requests. KHL P RESPONSE 1: "The primary justification offered in the question for the proposed extension is to encompass the identified existing and future developments in this area, however, such an extension is not required to ensure that these other existing and future projects are properly considered in the assessment of the Project's cumulative effects." ADDITIONAL CEC QUESTION TO RESPONSE 1: If these other existing and future projects are not included in an expanded Study Zone 5 how can they be "properly considered in the assessment of the Project's cumulative effects"?</p> <p>Could you please confirm that Study Zone 5 does not only overlap Hayes River Upland ecoregion of the Boreal Shield ecozone, but also the Churchill River Upland ecoregion of the Boreal Shield ecozone? Could you also confirm that Study Zone 5 also overlaps another ecoregion associated with a different ecozone, i.e., Selwyn Lake Upland ecoregion of the Taiga Shield ecozone? Could you also confirm that a small area of Study Zone 5 west of Limestone GS overlaps the Hudson Bay Lowland ecoregion of the Hudson Plains ecozone, i.e., the ecoregion that Study Zone 5 is not to overlap? The attached map may assist in KHL P's responses to these questions.</p> <p>In establishing spatial boundaries for cumulative effects, does Hegmann et al. (1999) not provide the following rules-of-thumb (see p. 14 of their document):</p> <ul style="list-style-type: none"> • "For terrestrial VECs such as vegetation and wildlife, ensure boundaries are ecologically defensible wherever possible." • "Set boundaries at the point at which cumulative effects become insignificant." • "Be prepared to adjust the boundaries during the assessment process if new information suggests this is warranted, and defend any such changes."? <p>Did the ecological criteria used by KHL P ignore the significant amounts of modeled habitat present in the Bipole III Transmission Project study area east of Study Zone 5 for the following VECs: mallard (see Map 1200-01 of the Birds Technical Report), bald eagle (Map 1500-01), olive-sided flycatcher (Map 2700-01), rusty blackbird (Map 3200-01), common nighthawk (Map 2400-01), as well as beaver (see Map 08 of the Mammals Technical Report) and moose (Map 10)? Did the ecological criteria used by KHL P to delineate the VEC regional study area boundary take into consideration that animal VECs move freely between Hayes River Upland ecoregion and the adjacent Hudson Bay Lowland ecoregion? Did the ecological criteria used by KHL P take into account that the ecosystem diversity, intactness, wetland function and priority plants VECs in Hayes River Upland ecoregion are not distinctly different from those in adjacent Hudson Bay Lowland ecoregion (i.e., beyond Study Zone 5), particularly in the transition zone between the two ecoregions? Why did KHL P not consider the "physical locations of all past, current and reasonably foreseeable future actions", particularly when these actions traverse the Study Zone 5 boundary, e.g., transmission lines between Long Spruce GS and Henday CS, eastern and northeastern extensions of the CN and the abandoned rail lines, northeastern extension of Highway 290 and eastern extension of the future Bipole III transmission line? Has the eastern boundary of Study Zone 5 been set at the point at which cumulative effects become insignificant, as recommended by Hegmann et al. (1999)? Do the extensions of these actions that occur within Study Zone 5 no longer have cumulative effects outside of Study Zone 5? Do all of the other projects within 60 km of the proposed Keeyask Generation Project not have a cumulative effect?</p> <p>KHL P RESPONSE 4:</p> <ul style="list-style-type: none"> • "The cumulative effects assessments considered from actions physically located outside of Study Zone 5, where effects from these actions have the potential to overlap spatially and temporally with those of the Project;" <p>ADDITIONAL CEC QUESTIONS TO RESPONSE 4:</p> <ul style="list-style-type: none"> • Please confirm that this statement only applies to caribou and that Study Zone 6 did not extend into the Hudson Bay Lowland ecoregion. • Please provide the rationale for not extending the caribou Study Zone 6 into the Hudson Bay Lowland ecoregion (it is noted that the Pen Islands caribou assessment extended beyond Study Zone 6, as indicated in the following KHL P response). Do caribou not freely move between the Hayes River Upland, Selwyn Lake Upland and Hudson Bay Lowland ecoregions? • Please confirm that this statement does not apply to the following terrestrial VECs: ecosystem diversity, intactness, wetland function, priority plants, Canada goose, mallard, bald eagle, olive-sided flycatcher, common nighthawk, rusty blackbird, moose and beaver. 	CEC Rd 2 CEC-0103a	CEC Rd 2 CEC-0103b	CEC Rd 2 CEC-0103c	CEC Rd 2 CEC-0103d	CEC-IR-103

Department	Volume / Document	Line Number / Table Number / Figure Number	Page	Topic	Context / Preamble e.g., provide applicable background/rationale for providing the comment	Specific Department Comment / Request for Additional Information:	Round 1 Proponent Response	Round 2 Intervenor Question	Round 2 Response #	original intervenor IR#
								<p>KHLP RESPONSE 5:</p> <ul style="list-style-type: none"> • “Where necessary to address the relevant population home range that may be affected by the Project, the cumulative effects assessment for certain VECs used additional study areas that extended outside Study Zone 5 and Study Zone 6. For example, the cumulative effects assessment study area for the Pen Islands caribou assessment extends through northeastern Manitoba and northwestern Ontario because this encompasses the range for this caribou population. Since this study area overlaps spatially with some effects from Conawapa, Bipole III (including Keewatinooow) and Gillam redevelopment (all east of Study Zone 5), the Pen Islands caribou assessment also considers effects from these developments even though they are outside of Study Zone 5.” <p>ADDITIONAL CEC QUESTIONS TO RESPONSE 5: Please confirm that this statement only applies to the Pen Islands caribou assessment. Please confirm that this statement does not apply to any other terrestrial VECs, including other caribou populations. Please confirm that Gillam redevelopment is located within (not east of) Study Zone 5.</p>	CEC Rd 2 CEC-0103e	
								<p>KHLP RESPONSE 6:</p> <p>“In all approaches, Project impact areas may include non-physical impacts, such as noise or traffic, where relevant for the topic.”</p> <p>ADDITIONAL CEC QUESTION TO RESPONSE 6: As construction activities associated with the Keeyask Generation Project will likely overlap with those associated with Bipole III and/or Conawapa, would traffic and associated noise not have cumulative impacts on animal VECs within and beyond Study Zone 5.</p>	CEC Rd 2 CEC-0103f	
CEC	KCN-EVRPTS	N/A	N/A	KCN Environmental Evaluations	<p>FIRST NATIONS CUMULATIVE EFFECTS ASSESSMENTS OF THE PROPOSED KEEYASK GENERATION PROJECT</p> <p>Manitoba Hydro, in collaboration with four Manitoba First Nations, i.e., Tataskweyak Cree Nation (TCN), York Factory First Nation (YFFN), Fox Lake Cree Nation (FLCN) and War Lake First Nation (WLFN), have formed the Keeyask Hydropower Limited Partnership (KHLP) to develop the proposed Keeyask Generation Project and the Keeyask Infrastructure Project.</p> <p>In a letter dated June 6, 2012 from V. Spence, Manager of Future Development, TCN, to T. Sargeant, Chair, Manitoba Clean Environment Commission with regard to the proposed Bipole III Transmission Project, it was stated that substantial hydroelectric development has occurred within the Split Lake Resource Management Area (SLRMA). “Existing hydroelectric development includes 35 major projects which cover a footprint of 124,000 acres of land – an area comparable to the City of Winnipeg. It is TCN’s position that Manitoba Hydro has not fully considered the cumulative effects of this development in the environmental impact statement. By limiting the spatial and temporal scale of their assessment, the Bipole III EIS fails to consider the impacts of past, existing, and future projects in their cumulative effects assessment, particularly those within the SLRMA and our Resource Area. Failure to consider these existing projects is failure to consider or fully understand the impacts on TCN and its Members. Furthermore, without a thorough understanding of the cumulative effects, it is difficult to identify and develop appropriate biophysical and socioeconomic mitigation strategies.”</p> <p>In an Environmental Review of the proposed Keeyask Generation Project, SLCFN (1996) provided some details on the effects of hydroelectric development in the SLRMA, as indicated below:</p> <ul style="list-style-type: none"> • Kelsey Generating Station (GS), which came into operation in 1960, “flooded land for a distance of 150 kilometres upstream of Split Lake along the Nelson River, affecting 14,250 acres of northern boreal forest”; • The “massive hydroelectric developments” in the 1970s altered “the landscape in ways which were far more dramatic and profound than the effects of the Kelsey generating station”; • The Kettle GS, which began operation in 1970, resulted in the flooding of “over 54,000 acres of land including many First Nation traditional harvesting, recreational and cultural sites”; • Long Spruce GS, which began operation in 1977, resulted in water level increases of 85 feet and the flooding of “over 3,400 acres of Nelson River shoreline and tributaries”; <p>In addition to the preparation of Environmental Impact Statement (EIS) for the proposed Keeyask Generation Project pursuant to the federal Canadian Environmental Assessment Act (CEAA) and the provincial The Environment Act, the four First Nations, collectively termed the Keeyask Cree Nations (KCNs), prepared separate Keeyask Environmental Evaluation Reports (CNP, 2012; FLCN, 2012; TCN, 2012).</p> <p>Although aware of the requirements of the CEAA and The Environment Act (Manitoba) in assessing the environmental effects of a major resource development project, the Keeyask Environmental Evaluation Reports were not prepared in compliance with these requirements (they did not need to be). Rather, the KCNs have selected their own approaches to the assessment of environmental effects on their communities that are based in their cultural identities and worldviews.</p> <p>The following was stated in the Executive Summary for the proposed Keeyask Generation Project EIS: “The cumulative effects assessment focuses on valued environmental components that will be adversely affected by the Project, based on the effects assessment summarized in Section 5 of this Executive Summary.</p> <p>The Partnership recognizes that the valued environmental component approach as required by the regulatory process does not capture the broader concept of the Cree worldview, which places equal importance on all components of the environment, as all parts are important and interrelated. Further, a cumulative effects perspective is inherent in the</p>	<p>Table 2 should be completed by Manitoba Hydro and combined with Table 1 to determine the total land area affected or to be affected by Manitoba Hydro projects and related activities in the SLRMA and FLRMA. This would provide a quantitative basis for determining the cumulative effects of past, existing and future projects/activities on the KCNs and the resource areas.</p> <p>References Cree Nation Partners (CNP) 2012. Keeyask Environmental Evaluation. A Report on the Environmental Effects of the Proposed Keeyask Project on Tataskweyak Cree Nation and War Lake First Nation. 129 p. Fox Lake Cree Nation (FLCN) 2012. Environment Evaluation Report. 89 p. Split Lake Cree First Nation (SLCFN) 1996. Analysis of Change. Split Lake Cree Post Project Environmental Review. Volume One. 96 p. Tataskweyak Cree Nation (TCN) 2012. Report on Keeyask Transmission Project. 46 p. Tataskweyak Cree Nation (TCN) 2012. Submission by Tataskweyak Cree Nation (TCN) to the Manitoba Clean Environment Commission Public Hearing on the Bipole III Transmission Project. 4 p. York Factory First Nation (YFFN) 2012. KIPEKISKWAYWINAN. Our Voices. 133 p.</p>	CEC-0035	<p>There are no questions. The CEC thanks KHLP for providing the data and has the following comments on the data. It was indicated in the preamble to CEC-IR-035 that: “Although aware of the requirements of the CEAA and The Environment Act (Manitoba) in assessing the environmental effects of a major resource development project, the Keeyask Environmental Evaluation Reports were not prepared in compliance with these requirements (they did not need to be). Rather, the KCNs have selected their own approaches to the assessment of environmental effects on their communities that are based in their cultural identities and worldviews. The following was stated in the Executive Summary for the proposed Keeyask Generation Project EIS: “The cumulative effects assessment focuses on valued environmental components that will be adversely affected by the Project, based on the effects assessment summarized in Section 5 of this Executive Summary. The Partnership recognizes that the valued environmental component approach as required by the regulatory process does not capture the broader concept of the Cree worldview, which places equal importance on all components of the environment, as all parts are important and interrelated. Further, a cumulative effects perspective is inherent in the</p> <p>CEC requested an update of the information that was compiled by the TCN on land areas that have been affected by Manitoba Hydro projects and activities between 1955 and 1994 to relate the scale of impact on terrestrial habitat due to the proposed Keeyask Generation Project and future projects/activities relative to the past projects and activities. As indicated in Table 1 of CEC-IR-035 and confirmed by KHLP in Table 3, Manitoba Hydro projects and related activities have affected approximately 50,100 ha of terrestrial habitat over 40 years. As indicated in Table 1, the total area affected by all past and current projects is 61,108 ha. Based on data provided by KHLP, future projects and activities will impact an additional 12,723 ha of terrestrial habitat over the next 15 years (see below).</p> <p>As indicated in the Table 1 response to CEC-IR-021, a total terrestrial habitat area of 71,515 ha will be impacted, representing approximately 5.6% of the Study Zone 5 area. This total impact area in the Table 1 response to CEC-IR-021 did not include the Conawapa Generation Project (Conawapa column indicating 0 ha). However, the Bipole III column (indicating 3,700 ha)</p>	CEC Rd 2 CEC-0104	CEC-IR-104

Department	Volume / Document	Line Number / Table Number / Figure Number	Page	Topic	Context / Preamble e.g., provide applicable background/rationale for providing the comment	Specific Department Comment / Request for Additional Information:	Round 1 Proponent Response	Round 2 Intervenor Question	Round 2 Response #	original intervenor IR#
					<p>Cree worldview, which considers the effects of the Project in the context of everything that is anticipated to happen in the future.”</p> <p>SENES had previously undertaken a review of the cumulative effects assessment undertaken for the terrestrial environment component of the proposed Keeyask Generation Project as presented in the Terrestrial Supporting Document, the EIS and the Executive Summary. This review identified a number of deficiencies particularly with respect to study area coverage of past, existing and future projects, as well as the selection of valued environmental components (VECs) and supporting topics and their carry over to cumulative effects assessment based on determination of negative residual effects.</p> <p>SENES has subsequently reviewed the Keeyask Environmental Evaluation Reports to determine how cumulative effects were assessed by the KCNs based on past, current and future projects, with an emphasis on the terrestrial environment. SENES also reviewed the TCN (2011) “Report on Keeyask Transmission Project” to determine whether cumulative effects were addressed.</p> <p>FLCN (2012) Environment Evaluation Report</p> <p>One of the objectives stated in the FLCN (2012) Environment Evaluation Report was:</p> <ul style="list-style-type: none"> • “Describe the known cumulative impacts of successive hydroelectric projects on our people and Aski.” <p>As part of the environmental assessment (EA) of the proposed Keeyask Generation Project undertaken by the KHLP pursuant to the federal CEA and The Environment Act (Manitoba), VECs were selected to focus the assessment of the significance of adverse effects. Subsequently, the cumulative effects assessment utilized a subset of VECs for which it was determined that there may be a negative residual effect.</p>			appears to include all of the Bipole III Transmission Project, including the Keewatinooow CS project components (despite the Keewatinooow column indicating 0 ha). Additional questions have been posed by CEC in CEC-IR-021 to clarify this discrepancy.		
CEC	TE SV	N/A	N/A	Terrestrial Environment	<p>The conclusion that residual effects from the Keeyask Generation Project on caribou are “expected to be adverse, small to medium in extent, long term in duration, and small in magnitude.” and that “there is a moderate to high degree of certainty in the assessment” is not supported by the evidence presented in the EA, which has significant deficiencies with respect to:</p> <ol style="list-style-type: none"> 1. Evaluation of status of summer resident caribou; 2. Assessment of effects of summer resident caribou and their habitat; 3. Assessment of effects on migratory caribou and their habitat; and 4. Proposed Mitigation. 	<p>Effects on Summer Resident Caribou</p> <p>Regardless of how they are classified, there is potential for Project-related effects on summer resident caribou at the range level and below, and for calving/nursery habitat. A number of major deficiencies in analysing potential impacts on habitat of forest-dwelling are identified:</p> <ol style="list-style-type: none"> 1. The southern portion of the Zone 6 RSA does overlap with portions of the ranges of two identified forest-dwelling woodland caribou ranges i.e. Wapisi (MB8) and Manitoba North (MN9). Potential direct or indirect impacts of this project on these ranges is not discussed or assessed. 2. No annual range has been delineated for the summer resident caribou using Stephens and Gull Lakes and the EA lacks sufficient supporting evidence is to determine the adequacy of the RSA (Zone 6) for characterizing such a range, particularly given that some forest-dwelling woodland caribou females move 200-500 km from wintering areas to calving sites (Environment Canada 2011, p. 74). Furthermore, although the RSA for caribou is listed as Zone 6 (TE-SV, p 1-21), cumulative effects on intactness were calculated for Zone 5 (TE-SV, p 1-20) not Zone 6, so the level of overall disturbance in the caribou RSA is unclear. 3. Calving and winter habitat modelling was conducted for forest-dwelling woodland caribou calving habitat and winter habitat for Bipole III and includes the northern half of the Keeyask GS caribou RSA. This modelling could presumably have been extended to include the entire Keeyask caribou RSA and been incorporated in the TE-SV. No justification is given for the summer resident caribou habitat models presented in the TE-SV i.e., primary calving/rearing islands defined as >10 ha. Was this based on data collected for Stephens and Gull Lakes? Attributes of used and unused calving islands in the RSA are not presented e.g., size, forest type, distance from shore, proximity to other islands, terrain, etc. This information is required to evaluate the statement in the CE-SV (p. 7-30) that “The small loss of calving habitat that will occur in the Local Study Area will in part be offset by an increase in the number of smaller islands in the Keeyask reservoir.” 4. Environment Canada (2011) has shown that the probability of persistence of forest-dwelling woodland caribou population can be predicted by the proportion of anthropogenic disturbance on a range using a 500 m buffer. In the TE-SV (p 131), low use linear features were buffered only 200 m (Mace et al 1996) whereas Environment Canada uses 500 m for all anthropogenic disturbance. Existing, disturbance levels for Keeyask might therefore be underestimated. 5. The TE-SV (pp. 6-370) states that that “because changes to intactness will be negligible” and that “The Project will not contribute to measurable changes in caribou intactness of the RSA”. The TE-SV predicts cores being >80% in Zone 5, but Zone 6 is the caribou RSA (and it may not accurately reflect the range) and the buffers used in the analysis were not consistent with Environment Canada (2011a). No benchmark or threshold for acceptable level of existing disturbance and additional level of disturbance was identified. EC (2011a) indicates that landscapes with more than 35% disturbed have a lower probability of persistence. 6. The TE_SV states that “because changes to intactness will be negligible, effects on caribou will likely be negligible”. Although disturbance is associated with lower probability of persistence, impacts can still potentially occur below the range level. Although 500 m was used for EC persistence models, other studies have shown disturbance effects at much greater (e.g. 10 km) from anthropogenic activities. Potential impacts on caribou from project activities e.g. sensory disturbance during construction, potential increases in hunter mortality from increased access, changes in predator prey dynamics from linear disturbance 7. Calving islands. The TE-SV states (7-61) “potential calving habitats are common in the Regional Study Area, and habitat does not appear to be limiting to the summer resident cows and calves”. The fact that only a small proportion of available habitat is used is not the point, since the anti-predator strategy of forest-dwelling woodland caribou is to spread out a low density across the landscape (i.e., one would expect low numbers and 	CEC-0037a			

Department	Volume / Document	Line Number / Table Number / Figure Number	Page	Topic	Context / Preamble e.g., provide applicable background/rationale for providing the comment	Specific Department Comment / Request for Additional Information:	Round 1 Proponent Response	Round 2 Intervenor Question	Round 2 Response #	original intervenor IR#
					<p>Status of Summer Resident Caribou</p> <p>The Response to EIS Guidelines (R-EIS) and the Terrestrial Environment Supporting Volume (TE-SV) characterize the caribou that use the RSA as:</p> <ol style="list-style-type: none"> 1. Barren-ground caribou from the Beverly-Qamanirjuaq herd 2. Coast caribou from the Cape Churchill and Pen Islands 3. Summer resident caribou. <p>According to the TE-SV (p.7-60) these "summer resident caribou are "a type of woodland caribou whose exact range and herd association is uncertain". The Project is north of the currently defined boundary of forest-dwelling woodland caribou ecotype in Manitoba (Manitoba Conservation 2006), however these summer resident caribou exhibit calving behaviour typical of forest-dwelling woodland caribou, calving singly instead of in large aggregations. According to the TE-SV, the summer resident caribou are conservatively estimated to number 20 -50 individuals, which is similar in size to the Owl-Flintstone Range that Manitoba Conservation (MC) is actively trying to conserve (Environment Canada 2012; Manitoba Conservation 2011).</p> <p>According to FLCN (2101, p. 48) caribou were historically abundant in the local area and were harvested year round, and were the primary source of red meat. FLCN Traditional Knowledge Report (2010) recognizes the three ecotypes and has separate names for them based on behaviour, distribution, and morphology. The summer resident caribou may belong to the previously described Nelson-Hayes population of boreal woodland caribou, and that this herd has not completely amalgamated with the coastal Pen Island population.</p> <p>Genetic studies indicated that most barren-ground caribou genotypes were found north of the Nelson River from 2004 to 2006 (Ball and Wilson; TE-SV 7-63), but the relationship between coastal woodland caribou ecotype and summer resident caribou remains to be clarified. There is some evidence from collaring data that some individuals may calve in the RSA but not in all years, potentially calving near the coast in subsequent years and no results yet available from preliminary DNA work conducted by MC and partners (S. Vick, Manitoba Conservation, pers. comm.). No collaring or genetic work appears to have been conducted by the proponent for the Keeyask GS, particularly summer collaring of resident caribou (i.e. those calving on Stephens Lake). Recent collaring data conducted by Manitoba Conservation, Bipole III, or the Ontario Ministry of Natural Resources are generally not discussed in any detail in the Keeyask EIS.</p> <p>The status of these summer-resident caribou has potential implications with respect to relevant legislation i.e., SARA, MESA and associated recovery strategies/plans.</p>	<p>low densities). It appears Stephens Lake is a regionally significant calving lake, with some on calving on Gull Lake as well. Caribou are potentially most sensitive during calving/nursery; impacts from construction and increased boat access on both Gull and Stephens Lake are poorly quantified and it is unsure if mitigation is sufficient.</p> <p>8. Cumulative impacts from all foreseeable projects are not adequately addressed. The EA states that the Keeyask Generation Project will reduce linear feature density (Response to EIS 6-325). However, it is clear that the Keeyask Transmission Project, the Bipole III Transmission Project, and the Keeyask Infrastructure Project are dependent upon each other and are part of the same overall undertaking. The net effect will be increased linear feature density in the RSA which needs to be clear in the cumulative effects section since it will negatively impact caribou. The statement in the Cumulative Effects Assessment (TE-SV p 7-29) "most effects of the Project will be negligible to small, particularly since habitat currently appears to be underutilized" is unsubstantiated and does not reflect the current understanding of woodland caribou ecology (e.g., bottom-up up versus top-down population regulation).</p>		<p>Uncertainty remains on the abundance, distribution, and relative habitat use of summer resident caribou and how that may influence assessment of current status and potential impacts.</p> <p>Confirmed caribou calving was predominantly on Stephens Lake islands compared to surveyed peatland "islands" (see TE-SV Map 7.32) although summer caribou tracking transect results (TE-SV Map 7-34) appear to indicate more widespread use of calving habitat in peatlands. How much confidence can be placed in field crews' ability to distinguish calf from adult caribou signs in peatland environments and how much certainty can be placed on the assumption from CEC-IR-037 (p 357) that "there is a similar quality of calving habitat distributed throughout the landscapes in study zones..."? If the assumption is incorrect, that also increases uncertainty regarding the number of summer resident caribou in the LSA and RSA, and ultimately their population sustainability. If the assumption is correct and the estimated population for Zone 5 is 128-320 animals, why is the figure of 20-50 animals from Zone 4 used on line 215 p 359 of IR response? Is 20 caribou also "the most conservative population estimate" used on line 388 p 364 when discussing Study Zone 5? Whether the population is considered sustainable or not according to EC models as discussed on p 359-60 depends on which population value and RSA are used.</p>	CEC Rd 2 CEC-0105	CEC-IR-105
CEC	TE SV	N/A	N/A	Terrestrial Environment		<p>Effects on Migratory Caribou</p> <p>The Project has the potential to impact winter habitat of migratory barren-ground caribou (Qamanirjuaq) and forest-tundra woodland caribou (i.e. coastal caribou – Cape Churchill and Pen Island) and traditional crossing sites on the Nelson River. According to the TE-SV (p 7-63) there are generally about 300 Pen Island caribou and less than 50 Cape Churchill caribou in the RSA during a typical winter, although larger numbers (100s to 1000s) are observed in some years. Approximately 10,000 Qamanirjuaq caribou have been estimated to reach the RSA in some winters, although this type of occurrence is "infrequent". Although infrequent, their use of the RSA could be ecologically and culturally significant.. The TE SV (7-146) states that the Project is not anticipated to "measurable affect" caribou in the RSA; however, "measurable affecting" is not the criterion used to determine significance of residual or cumulative effects.</p> <p>Several main deficiencies are identified:</p> <ol style="list-style-type: none"> 1. Assessment of disturbance impacts to winter habitat. One of the factors cited as potentially contributing to the potential decline in the Qamanirjuaq herd is loss of winter habitat from forest fires; anthropogenic disturbance could also affect winter habitat use, particularly if other portions of their winter range are unavailable due to snow conditions, fire or other disturbance. Resource Selection Function (RSF) models for BiPole III were not used to assess winter habitat in the RSA. 2. Traditional crossing sites for migratory caribou. Although the Nelson River generally serves as an extra-limital boundary for Qamanirjuaq barren-ground caribou in the Keeyask region, river crossing locations have been reported in the RSA and lower Nelson River. FLCN (2012, p. 25) states that fluctuating water levels can affect caribou since caribou cannot cross the river safely until the levels are low enough. Drowning has been observed along the Kischei Sipi. (Nelson River) according to FLCN (2012). The TE-SV (pp. 7-62) states "after the construction of the Kettle GS, there were virtually none south of the Nelson River". It is not clear whether a causal relation is implied. Potential impacts on crossing sites needs a more complete analysis (e.g. comparison with other sites on the Nelson) since the earlier formation of thin ice across the reservoir coincides with arrival of caribou in the LSA. 3. Cumulative effects from other related projects as well as other existing or reasonably foreseeable projects in the RSA on winter habitat and traditional crossing sites. Monitoring was conducted for the other related projects (e.g., Bipole III, Keeyask Transmission, Road and Infrastructure) should be better incorporated in this EA. In particular, the impacts of linear corridors such as transmission rights-of-way and the upgraded provincial highway (PR 280) need to be examined in more detail for disturbance effects and increased hunter mortality. 4. The rationale for the Caribou Access Program and an annual hunt needs to be justified given: a) the report states that there are no measurable effects on caribou (TE-SV 7-35) and b) migratory coastal (Pen Island, Cape Churchill) and barren-ground (Qamanirjuaq) caribou do not winter every year in the Keeyask area and c) given that access to the LSA will increase due to the road upgrades and transmission ROW. The statement that "Recreational fishers and hunters may [bold added] make use of the new boat launch facilities up and downstream of the GS in the operation phase" is inconsistent with existing resource use patterns where access is a key issue and appears to understate the issue since it is likely that there will be increased recreational hunting and angling upstream and downstream of the GS. The statement "that residual effects to recreational resource users are expected to be neutral Resource Use SV pp. 1-94" is questionable and the lack of proposed mitigation a potential risk to caribou. The potential impact of the Caribou Access Program on caribou outside the RSA also needs to be analyzed and presented in the TE-SV. 	CEC-0037b			
						<p>These deficiencies include:</p> <ul style="list-style-type: none"> • The study area for noise includes "the general footprint of the principal generating station structures and reservoir, as well as access roads and other supporting infrastructure" (PE-SV, p. 3-4). Given that Gull Rapids can be heard as far away as 18 km (PE-SV p. 3-6) and construction noises can extend far beyond the footprint, it is not clear that this LSA is adequate for characterizing baseline conditions or assessing potential impacts. • No baseline monitoring of existing noise levels noise at the Project site, reservoir, and access roads was conducted. The characterization of the LSA that "it is expected that the ambient noise profile would be consistent with isolated, remote northern geographic areas" with "the expected outdoor average sounds levels in the range of 35 dB to 45 dB" is unsupported. Gull Rapids is a significant noise source and there will be spatial variation in the LSA depending upon local topography and vegetation. • No predictive modelling for construction and operational phase of the project was undertaken for blasting, traffic, or general construction activities. Potential noise impacts vary depending on a number of factors including taxa, distance from source, noise frequency (kHz) and magnitude, and type (percussive vs. continuous), but these 		<p>It is still not clear what was used as the LSA for noise impacts or to what distance noise impacts are anticipated for caribou calving. Map 7-44 of the TE-SV shows "affected calving areas" in Zone 2 (footprint + 150 m) but it is not clear if that implies just those directly impacted from clearing or flooding. The TE-SV (p 7-113) states that "In heavy construction areas, some summer resident caribou activity will likely decline within 2 km of the south access road and up to at least 4 km from the GS, which will most likely result in a loss of effective habitat (Manitoba Hydro 2011c)." and woodland caribou activity decreased</p>		

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CEC	TE SV	N/A	N/A	Terrestrial Environment	Several deficiencies are noted with respect to potential noise impacts on wildlife, notably summer resident caribou on Stephens Lake, nesting and migrating waterfowl, nesting gulls and terns, and breeding songbirds (including SAR).	are not addressed. • The construction noise is described as "construction activity will cause elevated noise levels within the immediate construction site, with sound propagating away from the origin of the noise and attenuating with distance back to normal ambient noise levels for the local study area". No supporting data or values are provided for the magnitude, frequency (kHz), or distance. • Characterization of the noise impacts is inconsistent. For example, Table 3.4-5 (PE-SV, p. 3-19) indicates that noise will be "intermittent" but the text (p 3-18) mentions "continuous" noise. The duration is described as "short" although construction activities will take place over multiple years, variously described as 6 to 8.5 years (PE-SV, p. 3.7, 3-11, 3-13), which is longer than the typical lifespan of some potentially affected species. • Information provided on mitigation measures is inadequate to assess their effectiveness, particularly timing windows and the criteria for assessing when and how mitigation will be applied. The Proponent indicates that blasting will be undertaken outside of the sensitive breeding period (April 1-July 31) for birds "to the extent practicable" to minimize disturbance to breeding birds (TE-SV, p. 6-341, 343; PE-SV p.3-13) and from May 15 to June 30 for calving woodland caribou. However, "to the extent practicable" is not defined, minimizing impacts is not equivalent to having no impacts. The proposed mitigation measures do not address other, non-blasting, construction noise.	CEC-0042	approximately 80% within 4 km of the Wuskawatin generating station site after construction began. On p 7-114 it states that about 1250 ha or 9% of the primary and secondary caribou calving and rearing habitat in the LSA will be affected, but it is not clear on what this is based since no predictive modelling was conducted. The cited reference (Manitoba Hydro 2011c) is for the Wuskawatin project, and it isn't clear what was used for the distance to which noise impacts are predicted for the Keeyask project. Please clarify which study area and/or distance(s) were used for predicting impacts from noise and other construction disturbance and the distance noise impacts on caribou (calving and winter). Please provide cited reference Manitoba Hydro 2011c.	CEC Rd 2 CEC-0106	CEC-IR-106
CEC	TE SV	6.5.7.2.5 Conclusion about Residual Effects on Mallard	6-345	Terrestrial Environment		It is not clear how riparian wetlands on smaller tributaries and constructed wetlands will replace those on the Nelson River used by VECs, particularly mallards and Canada geese. YFFN has indicated fewer geese and ducks in the Split Lake area because the shoreline habitat that they use has been flooded and eroded, and FLCN stated that after hydro flooding and the loss of stable shoreline, the number of nesting waterfowl declined (Response to EIS guidelines p. 6-13). The number of nesting and staging mallards is much higher on Nelson River, Gull Lake, Clark Lake, than inland lakes or Stephens Reservoir but impacts are not well quantified. The TE-SV (6-347) states that there is currently limited breeding habitat within the Project effects area; if this is true (only 3% of the breeding habitat is affected), the rationale for creating mallard nesting platforms is questionable. The conclusion on residual effects (TE-SV 6-347) makes no mention of foraging habitat in riparian wetlands even though there will be a long-term loss of these areas due to the flooding of the reservoir. It is also not clear how impacts were measured against thresholds to determine significance of effects. Effects on mallards were characterized as "small" in magnitude and within the range of natural variability. However, no evidence was presented on the range of natural variability in mallard populations in the RSA nor what the population-level effect was predicted to be (e.g. # of nesting pairs/individuals), and it is not clear how the long-term loss in riparian wetlands on the Nelson River could be characterized as within the range of natural variation. Overall potential Project-related residual effects on Canada geese are also expected to be adverse but regionally acceptable, "largely because there is considerable amount of other available staging habitat in the region" but the evidence presented for staging habitat elsewhere in the RSA does not support that statement. The TE-SV states that "It is expected that until suitable shoreline wetland vegetation re-establishes in the reservoir, geese use of the reservoir during the migration periods will be minimal during operation". Given that Stephens Lake does not support many staging Canada geese compared to Gull Lake, this suggests staging habitat has not recovered over 20 years since the construction of the Kettle GS. According to the Response to EIS Guidelines (6-113) "the quality of inlets and bays along the Nelson River and Gull Lake as staging habitat for mallards will to continue to vary depending upon river water levels. How proposed changes to water management (e.g., peaking, seasonal timing, etc.) on Gull Reservoir will affect wildlife compared to the current regime needs to be more fully assessed.	CEC-0041	There is a discrepancy in the amount of mallard breeding habitat presented in the TE-SV and the IR responses #41 and for Cumulative Effects (Table 2. Bird VECs: habitat available and habitat affected by Keeyask and Past, Present Potential Future Projects). The TE-SV (p. 6-47) states that approximately 3% of the RSA (1908 ha) of mallard breeding habitat will be lost during construction and operation, whereas The CEC-IR-041 response (p. 411, lines 91-93) states that approximately 5% of the 67,132 ha of mallard breeding habitat in the RSA (3356 ha) will be lost. The CEC-IR-0022 Table 2 indicates 2,958 ha of mallard breeding habitat lost. Please explain the discrepancies. On p 41, line 90 it states there is 64,425 ha of mallard breeding habitat and the following sentence states there is 67,132 ha of potential mallard breeding habitat; what is the difference between the two?	CEC Rd 2 CEC-0107	CEC-IR-107
CEC	AE SV	N/A	N/A	Aquatic Environment	Overall, the analysis of potential increases in fish mercury concentrations in Keeyask Reservoir reaches reasonable conclusions. Baseline fish mercury concentrations are adequately characterized and fish mercury concentrations are predicted to increase, consistent with observations from existing reservoirs after flooding occurs. The predicted peak concentrations, and the duration of increased concentrations (up to 30 years) are within the range observed for other reservoirs on the Canadian Shield. Fish mercury concentrations are also predicted to increase in Stephens Lake, although significantly less than in Keeyask Reservoir.	The downstream limit of increased fish mercury concentrations appears to be Stephens Lake. A clear rationale for this limit would be useful. As well, little information was found on the expected upstream limit of increased fish mercury concentrations (e.g., if fish move upstream of the reservoir). Even if the effects beyond the Reservoir and Stephens Lake are expected to be nil/negligible the rationale should be discussed.	CEC-0048	In the response to CEC-0048, at the end of the second paragraph it is indicated that "Thus, methylmercury export via suspended particular matter or invertebrates from Stephens Lake to further downstream will likely be much reduced, limiting the potential for post-Project increases in fish mercury concentrations beyond Stephens Lake. These conclusions are supported by empirical results for reservoirs in Quebec and Labrador." Generally, studies from Hydro Quebec have revealed that MeHg mercury levels decrease when a large waterbody is encountered. However, the above assumes that the Stephens Lake Reservoir has similar characteristics to the downstream waterbodies in Quebec and Labrador referred to in the Schetagne et. al, 2003 paper. Are the characteristics of these waters referred to in the Schetagne paper analogous to the Stephens Lake Reservoir? Or put another way what evidence is there that Stephens Lake will trap particulate matter in the same way as the Quebec and Labrador downstream waterbodies? Please explain. As well, the above stated conclusion would likely not account for potential entrainment of fish with higher mercury levels from Stephens Lake due to injury/mortality as forage in the tailraces of Kettle, Long Spruce and Limestone GSs and therefore resulting in elevated concentrations in feeding fish. This situation has been associated with large hydroelectric plants in Quebec and Labrador (Brouard et. al., 1994; Anderson, 2011). The rationale given to support the conclusion that MeHg concentration in water and plankton downstream of Stephens Lake is plausible but is viewed as more of a hypothesis than a highly confident outcome by this reviewer. It is therefore recommended that downstream monitoring be carried out to support the proponent's expectations, as a matter of prudence. References Anderson, M.R. 2011. Duration and Extent of Elevated Mercury Levels in Downstream Fish Following Reservoir Creation. River Syst. 19: 167-176. Brouard, D., J-F. Doyon and R. Schetagne 1994. Amplification of Mercury Concentrations in Lake Whitefish (Coregonus clupeaformis) Downstream of the La Grande 2 Reservoir, James Bay, Quebec, pp. 369 – 380. In: C.J. Watras and J.W. Huckabee [Eds.], Mercury Pollution: Integration and Synthesis. Internat. Conf. Mercury as a Global Pollutant (1992), Monterey, California, Lewis Publishers, Boca Raton, Florida.	CEC Rd 2 CEC-0108	CEC-IR-108
CEC	AE SV	N/A	7E-3	Aquatic Environment		It is not clear that the modifications to the regression model for fish Hg burden described on AE SV p. 7E-3 are valid. Specifically, the authors replaced the original intercept coefficient of the regression line for fish Hg burden with a value meant to reflect site-specific conditions for the Keeyask study area. The slope of the line was not changed. The overall result is a lower predicted fish Hg burden (and concentration) than if the original regression model was used. Are the slope and intercept of the regression equation only valid however as a combination that optimizes the model fit to the data? If the intercept is forced to change, should the regression line be re-fitted to the overall set of observations from reservoirs, which would produce a different slope, and different predicted fish Hg level than presented here?	CEC-0051b	The Response to 51-b states that the slope and intercept of the regression model are independent of each other, with the intercept representing existing conditions (no flooding), and the slope defining the increase that occurs due to flooding. This reviewer, in contrast, has the view that the intercept and slope of the regression are highly dependent on each other, and combine to optimize the model fit to observations. If the existing baseline fish Hg concentration for Keeyask is set as the intercept, the regression should be re-optimized to go through that intercept and still provide the best overall fit to observations from reservoirs that had flooding. The resulting values for the intercept and slope would then be used to make predictions for Keeyask. The intercept can be seen as the existing concentration, and the slope can be seen as the increase due to flooding, as the proponent indicated. It is the method used to estimate the slope and intercept that the reviewer disagrees with.	CEC Rd 2 CEC-0109	CEC-IR-109

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CFLGC	R-EIS Guidelines	4.6.14 Water and Wastewater Treatment	4-39 and 4-54	Project Description		On page 4-39, it is stated that "Filtered backwash from the water treatment plant operations will be discharged to the Nelson River" This "effluent quality will meet or exceed Manitoba's standards..." Please explain how: 1) the community was informed of this process and their responses to the effluence, especially the Fishermen and Elders from FL 2) the data may exceed Manitoba's standards 3) the research was completed for alternative means of treating wastewater and fecal matter for current and future projects Ekosi.	CFLGC-0013	Ln 36 – if the data of effluence was shared between the Gov and Manitoba Hydro, were the Elders and fishermen present at these meetings (since they are the most impacted?) Ln 52-53 – how often will the effluence exceed manitoba's levels? How will this be monitored? What will be done to ensure no large concentrations of faecal matter will be washed up on shore? By how much will these concentrations be exceeded? Will larger amounts exceed at specific times of the year, ex. In the spring? How will local populations be informed in these levels are exceeded? How will the Elders and fishermen be informed, or how will their concerns over fecal matter in the water be addressed? Line 47-48: how will Manitoba Hydro deal with the ecosystem change with the resevoir of standing water, ie, with the increase of insects? Line 60-61- what will happen to the effluence if it is above 200? Also, what about additional phosphates and products released into the water from camp laundry, dishwashing, and other chemical products? How ill these be monitored? Line 81-88 – was biological waste water treatment explored? If so, please provide data from the reports made by the consultants mentioned as to why such methods are not used.	CEC Rd 2 CFLGC-0025a CEC Rd 2 CFLGC-0025b CEC Rd 2 CFLGC-0025c CEC Rd 2 CFLGC-0025d CEC Rd 2 CFLGC-0025e	CFLGC-IR#2-001
CFLGC	R-EIS Guidelines	6.8 Effects and Mitigation Heritage Resources	6-561	Socio-Economy		On Page 6-561, it is stated that: "the approach taken to interpreting the effects and extending the appropriate mitigation to heritage resources known and unknown was based on the results of archeological field investigations, ATK...on archeological sites". Please explain how intangible cultural heritage, as defined by UNESCO's Convention for the Safeguarding of Intangible Cultural Heritage, will be affected and mitigation measures taken to ensure their protection. Ekosi.	CFLGC-0007	How does Manitoba Hydro and future hydro projects impact Makeso Sakahican's intangible cultural heritage as it is discussed in their response? How does Manitoba Hydro intend to minimize the negative impacts on intangible cultural heritage in Makeso Sakahican? How will MH ensure that more than the tangible heritage that is evidenced through ceremonies at project milestones, are protected, such as relationship to the land. Ekosi.	CEC Rd 2 CFLGC-0026	CFLGC-IR#2-002
CFLGC	R-EIS Guidelines	6.4.2 Aboriginal Traditional Knowledge	6-239	Aquatic Environment		On Page 6-239, it is stated that: "the Keeyask dam is expected to negatively affect fish populations by blocking fish movements...and causing spillway and turbine mortality". Please provide us with the appropriate fish passage report on Keeyask and for BiPole 3 that helps portray this data. Ekosi.	CFLGC-0008	Ln 66 -Why is there no fish passage report for BiPole 3? What about all the river and streams that the line will go through, thus affecting the aquatic life in these streams? We would like an aquatics report for BiPole 3 with all the information pertaining bridges, access roads and construction sites that will cross through streams of the project area. Ekosi.	CEC Rd 2 CFLGC-0027	CFLGC-IR#2-003
CFLGC	R-EIS Guidelines	1.4 Aboriginal Traditional Knowledge, Local Knowledge and Technical Sources	1-10 and 2-39	Socio-Economy		On page 1-10 of the EIS, it is stated that "KCNs have led their evaluations of the effects of the Project on their communities and Members, they have also collaborated in the preparation of this EIS". However, on p. 2-39, it is stated that the "Fox Lake Traditional Knowledge program emerged at a later stage of the environmental assessment process". Please provide an explanation to: 1) the contradiction on how the data was compiled to make up the EIS - especially since the TK data was documented at later stages. 2) provide examples how Fox Lake was collaborating on the writing of the EIS, the chapter components found within and the components of the "Cree world view" that are embedded in the EIS but not credited to any First Nation members specifically. Ekosi.	CFLGC-0002	Ln 17-19: Since we are a group composed of Makeso Sakahican Elders, and since individuals like Rachel Eni were contracted by Fox Lake Negotiations Office, members of Makeso Sakahican who were and continue to be covered by these studies, can certainly ask for these reports at the Gillam or Winnipeg Offices. Kindly inform the offices that we will be asking for these reports, and that we would like to have them ready for pick up in August. Ekosi.	CEC Rd 2 CFLGC-0028	CFLGC-IR#2-004
CFLGC	R-EIS Guidelines	2.6.2 Laying the Foundation for Diplomatic Relationships: Forgotten Nation in the Shadows of the Dams	N/A	Response to EIS Guidelines		In this section, there is mention of the report entitled: "The Forgotten Nation in the Shadows of the Dams" (1997). We would like a copy of this report. Ekosi.	CFLGC-0010	Ln 17-19: Since we are a group composed of Makeso Sakahican Elders, and since individuals like Rachel Eni were contracted by Fox Lake Negotiations Office, members of Makeso Sakahican who were and continue to be covered by these studies, can certainly ask for these reports at the Gillam or Winnipeg Offices. Kindly inform the offices that we will be asking for these reports, and that we would like to have them ready for pick up in August. Ekosi.	CEC Rd 2 CFLGC-0028	CFLGC-IR#2-004
CFLGC	R-EIS Guidelines	6.6.2 Aboriginal Traditional Knowledge	6-426	Socio-Economy		On page 6-426, it is stated that adverse social economic effects have been identified. We would like more information on the discussions about these effects, so please provide us with all the reports and studies completed or not-yet-completed by Rachel Eni. Ekosi.	CFLGC-0017	Ln 17-19: Since we are a group composed of Makeso Sakahican Elders, and since individuals like Rachel Eni were contracted by Fox Lake Negotiations Office, members of Makeso Sakahican who were and continue to be covered by these studies, can certainly ask for these reports at the Gillam or Winnipeg Offices. Kindly inform the offices that we will be asking for these reports, and that we would like to have them ready for pick up in August. Ekosi.	CEC Rd 2 CFLGC-0028	CFLGC-IR#2-004
CFLGC	R-EIS Guidelines	Executive Summary	21, 36, 39	Executive Summary		The EIS and the executive summary defines the Valued Environmental Components (VECs) as on the basis of cultural ideals or scientific concern. Please provide for us how the proponents of the Keeyask place intangible cultural heritage as defined by UNESCO's Convention for the Safeguarding of Intangible Cultural Heritage, in this understanding of cultural ideals and scientific concern. Ekosi.	CFLGC-0015	Keeping in mind that the experiences and histories of each of the Cree First Nations are unique, please explain what is meant by a "collective expression of intangible heritage", and how this "collective expression of KCN worldview" was written?". How did Manitoba Hydro enable the communities to get together and discuss their collective expressions? Was any funding provided by MH?	CEC Rd 2 CFLGC-0029	CFLGC-IR#2-005
CFLGC	R-EIS Guidelines	N/A	N/A	Response to EIS Guidelines	Please provide us with a copy of poster-sized maps of:	1) Gillam area prior to any Manitoba Hydro development and any flooding 2) Gillam area after Kettle dam and Stephen's Lake 3) Nelson River after Long Spruce 4) Nelson River after Limestone	CFLGC-0020a CFLGC-0020b CFLGC-0020c CFLGC-0020d	Line 13- The "actual" levels (of 220.66km2 & 13.76 ofr example) are very outdated (1990) Please provide us with more recent data.	CEC Rd 2 CFLGC-0030	CFLGC-IR#2-006

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						5) predictions of the submersions and flooding that was to occur after the construction of Kettle Dam in Gillam 6) predictions of the submersions and flooding that was to occur after the construction of Limestone 7) predictions of the submersions and flooding that was to occur after the construction of Long Spruce	CFLGC-0020e CFLGC-0020f CFLGC-0020g	Ekosi.		
CFLGC	R-EIS Guidelines	6.6	N/A	Socio-Economy		Section 6.6 describes the numerous benefits and employment opportunities that are available to First Nations. 1). Please provide us with a list of investments and business opportunities that will be created for the First Nations and those which will be assisting First Nations develop their own business opportunities. 2). How will challenges discussed on page 6-434 be resolved? 3). How will the percentage of the Aboriginal workforce be increased from the low numbers that are predicted to be in Keeeyask on page 6-432? 4) Please explain why community enhancement through investments and training in leadership, governance, law and engineering are not part of Manitoba Hydro's mandates towards community members.	CFLGC-0021	Line 70. What is meant by "absolute amount of employment"? In regards to the referential hiring of Aboriginal residents - please write what positions do Aboriginal residents currently hold at Manitoba Hydro in Gillam? Line 149-150 – How many of the 12 in 2013 and 8 individuals in 2012 were from Fox Lake? Ekosi.	CEC Rd 2 CFLGC-0031	CFLGC-IR#2-007
CFLGC	R-EIS Guidelines	N/A	N/A	Response to EIS Guidelines		In the updated Keeeyask Traffic Assessment, it is stated: "the updated traffic analysis examines the effects of construction traffic on public roads (PR 280 and PR 391). It does not include traffic effects on private roads or traffic experienced during the operation phase. As a result, the north and south access roads, which will be private during construction, have not been considered in this analysis" (page i) Please answer the following questions: 1) if the North and South Access Roads will be private during construction only, will they become public/provincial highways after construction is complete? 2) if so, when will that be? 3) if so, please provide us with a) a traffic report that discusses public involvement; terrestrial & aquatic & social/heritage effects b) monitoring during and post construction c) access to the road by MH workers as well as Fox Lake community members d) any and all compensation/access agreements of the trappers/resource users of all the areas that the North and South Access Roads will go through 4) Will the pr280 be decommissioned? 5) if so, please provide what "decommissioning" means and what it entails. 6) if so, will all concrete, pipes and man-made material be removed and will soil & trees be re-planted (ie. Will the area be rehabilitated?) 7). Please provide us with any benefits that exists for the Fox Lake community members to have the SAR. 8). Please explain how the First Nations and especially Fox Lake participated in the initiation, design and monitoring of the SAR and NAR.	CFLGC-0019	Ln 85- the questions have not been answered. Since MH is promoting these roads primarily for hydro development, will they be working with MIT to decommission the NAR to pre-road (or almost) conditions? What environmental and social impacts does Manitoba Hydro foresee with BOTH roads in operation? (since one may be closed at a later date, until then, what effects are predicted?) Ekosi.	CEC Rd 2 CFLGC-0032	CFLGC-IR#2-008
chiwasihk Kay-tay-a-ti-suk										
KK	N/A	N/A	N/A	Socio-Economy		Please describe the manner and degree to which the Proponent treats and has treated the Inneseewin of Kaweechiwasihk Kay-tay-a-ti-suk with equal importance and value, with a particular discussion, as examples, of the consideration in the Environmental Impact Statement of: a) Lake Sturgeon; b) Pickerel; c) Whitefish; d) Northern Pike; e) Woodland caribou; f) Moose; g) Fur-bearing animals; and h) Other fish and wildlife.	KK-0006	a) Please describe the principal differences between the observations and perspectives of ATK and technical science on matters considered by the Proponent. b) Using one or more examples of such differences between the observations and perspectives of ATK and technical science on a matter, please describe how the Proponent proposes that these differences be addressed in monitoring plans.	CEC Rd 2 KK-0014	KK-IR2-001
KK	N/A	N/A	N/A	Aquatic Environment		Where the Proponent asserts in the EIS that Aboriginal Traditional Knowledge (ATK) will play a role in future monitoring activities, to examine: a) how ATK was identified, documented, contributed or solicited; b) how ATK was considered; c) which elements of the project monitoring will or are expected to take ATK into account; d) in the context of project monitoring, how ATK is expected to assist in addressing any gaps in baseline information or the prediction of impacts; and e) in the context of regulatory requirements, including licence terms and conditions, how ATK is expected to assist in addressing gaps in baseline information or the prediction of impacts.	KK-0007b	Please confirm whether the Proponent presently anticipates that both the technical monitoring programs and the community-based ATK programs will be incorporated by regulators into the terms and conditions of the project licences, and/or into the protection plans, monitoring plans and the management plans associated with the project licences, particularly in order to "address uncertainty in the assessment identified where ATK and technical assessments reached different conclusions".	CEC Rd 2 KK-0015	KK-IR2-002
KK	N/A	N/A	N/A	Aquatic Environment		Where the EIS refers to effects of the Project on Lake Sturgeon or other fish species, including in the context of the monitoring of the effects of the Project on the populations of Lake Sturgeon and other fish species, please describe and provide: a) where ATK is a source of the information relied upon regarding the conclusions in respect of the effect on Lake Sturgeon and other fish species, the explanations requested in KK-IR-007A (a) through (d), inclusive; and b) where the EIS suggests and appears to rely upon the role of ATK in the monitoring of the effects on Lake Sturgeon and other fish populations, the explanations requested in KK-IR-007B (a) through (e), inclusive.	KK-0009	Please confirm whether the Proponent presently anticipates that both the technical monitoring programs and the community-based ATK programs will be incorporated by regulators into the terms and conditions of the project licences, and/or into the protection plans, monitoring plans and the management plans associated with the project licences, particularly in order to "address uncertainty in the assessment identified where ATK and technical assessments reached different conclusions".	CEC Rd 2 KK-0015	KK-IR2-002

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KK	N/A	N/A	N/A	Terrestrial Environment		Where the Proponent refers to Woodland Caribou which calve in the general area of the Project and in the general vicinity of Gillam, please describe and provide: a) the analysis applied to arrive at any conclusion in respect of "Gillam area" woodland caribou being "coastal caribou" and not a distinct herd of woodland caribou that is apart from the Pen Island herd of woodland caribou; and b) in the event that ATK is a source of the information relied regarding the conclusions of the Proponent described at a), above, the explanations requested in KK-IR-007A (a) through (d), inclusive.	KK-0012	Please confirm: a) the present understanding of the Proponent of the winter range of summer resident caribou; b) whether the winter location of "(p)ossible sedentary or short distance caribou" as described at KHLP response to CEC Rd 1 KK-0012, page 4 of 6, lines 110-113, generally corresponds with the present understanding of the Proponent of the winter range of summer resident caribou.	CEC Rd 2 KK-0016	KK-IR2-003
KK	N/A	N/A	N/A	Aquatic Environment		Where the EIS refers to effects of the Project on Lake Sturgeon or other fish species, including in the context of the monitoring of the effects of the Project on the populations of Lake Sturgeon and other fish species, please describe and provide: a) where ATK is a source of the information relied upon regarding the conclusions in respect of the effect on Lake Sturgeon and other fish species, the explanations requested in KK-IR-007A (a) through (d), inclusive; and b) where the EIS suggests and appears to rely upon the role of ATK in the monitoring of the effects on Lake Sturgeon and other fish populations, the explanations requested in KK-IR-007B (a) through (e), inclusive.	KK-0009	Please confirm whether at any time during the bilateral and multilateral planning processes involving the KCNs and Manitoba Hydro it was raised, suggested, discussed or considered, whether conceptual or otherwise, that the provision of fish passage at the Kelsey Generating Station to restore the passage of Sturgeon between the Upper Nelson River and Lower Nelson River might form a part of the potential options and measures to mitigate the direct and cumulative effects on Sturgeon resulting from the Project, and if so, please: a) summarize in general terms any such suggestion, discussion or consideration; and b) describe and provide any conclusions of the Proponent in respect of any such suggestion, discussion or consideration of such options and measures.	CEC Rd 2 KK-0017	KK-IR2-004
KK	N/A	N/A	N/A	Aquatic Environment		Where the Proponent refers to consideration of options to provide fish passage at the Keeyask Generating Station, including consideration of potential measures to mitigate the direct and cumulative effects on sturgeon resulting from the Project, and to the conclusions of the Proponent in respect of the consideration of such options, please describe and provide: a) whether consideration was given to the design and installation of fish passage facilities at the location of the former rapids at the Kelsey Generating Station to restore the passage of Sturgeon between the Upper Nelson River and Lower Nelson River, and if so, the conclusions of such consideration, together with any studies or reports; and b) in the event that ATK is a source of the information relied regarding the conclusions of the Proponent in respect of the design and installation of fish passage facilities at the location of the former rapids at the Kelsey Generating station, to provide the explanations requested in KK-IR-007A (a) through (d), inclusive.	KK-0013	Please confirm whether at any time during the bilateral and multilateral planning processes involving the KCNs and Manitoba Hydro it was raised, suggested, discussed or considered, whether conceptual or otherwise, that the provision of fish passage at the Kelsey Generating Station to restore the passage of Sturgeon between the Upper Nelson River and Lower Nelson River might form a part of the potential options and measures to mitigate the direct and cumulative effects on Sturgeon resulting from the Project, and if so, please: a) summarize in general terms any such suggestion, discussion or consideration; and b) describe and provide any conclusions of the Proponent in respect of any such suggestion, discussion or consideration of such options and measures.	CEC Rd 2 KK-0017	KK-IR2-004
Manitoba Wildlands										
MB Wildlands	PD SV	2.3 Principal Structures; 2.4 Supporting Infrastructure	N/A	Project Description		To enable Life Cycle Assessment of each principal structure and supporting infrastructure of the Keeyask Generation project, provide estimate for: 1) Material use quantities for initial construction, and then maintenance/repair/replacement over the project's service life; 2) Construction, excavation and quarrying energy use for initial construction and the maintenance, repair, replacement construction; 3) Demolition, excavation, and deconstruction energy use for maintenance, repair, replacement and decommissioning; 4) Quantity of explosive, particulate matter emissions, and emissions to water for initial construction, maintenance/repair/replacement, and decommissioning; For each component of the Keeyask Generation project. These materials and energy use quantities to be provided for construction, and life of the project. As per section 2.4.17 this request includes KIP infrastructure in the LSA for Keeyask Generation These requests are in an IR at the request of Manitoba Hydro Keeyask project managers.	MB Wildlands-0058	Please clarify whether the following principle structures and supporting infrastructure elements (as defined in the EIS Project Description volume) are included in the LCA analysis scope: • Transition structures • Wing walls • Main camp and work areas buildings • North and south dykes • Sources of rock, granular and soil material • Placement areas for excess excavated material For elements not included in scope, please provide an estimate of life cycle environmental effects or a justification for exclusion from analysis.	CEC Rd 2 MB Wildlands-0087	MWL-IR-087
								The following activities are reported to be included in LCA analysis scope (Section 8.2.1.1), but the corresponding environmental effects are not presented in Table 15: • A5 - Extract gravel • A6 - Transport gravel • A15 - House laborers • A22 - Mix concrete • C13 - Remove transmission line Please clarify where results for these activities are provided in the report; for activities not included in scope, please provide an estimate of life cycle environmental effects or a reason for exclusion from analysis.	CEC Rd 2 MB Wildlands-0088	MWL-IR-088
								The following activities are reported to be included in LCA assessment scope (Section 8.2.1.1), but are reported to have no associated environmental effects (i.e. 0 values) in Table 15: • A3 - Construct transmission line • A10 - Rehabilitate laydown and access roads • A19 - Mine aggregate • A23 - Manufacture precast concrete • A24 - Transport precast concrete to site Please provide an estimate of life cycle environmental effects or a justification for exclusion from analysis.	CEC Rd 2 MB Wildlands-0089	MWL-IR-089
MB Wildlands	PD SV	2.3 Principal Structures, 2.4 Supporting Infrastructure	N/A	Project Description		Estimates requested for principal structures, and supporting infrastructures as noted in reference volume: 1) Mix designed for ready mix concrete and grout. 2) Materials manufacturing locations, and transportation distance and mode to site. 3) Construction waste factors (% concrete, % structural steel, etc) for initial construction and maintenance, repair, replacement. 4) End of life outcomes for materials (disposal, incineration, recycling, reuse) for initial construction (construction waste), maintenance/repair/replacement, and decommissioning. 5) Material transportation distance and mode to end of life facility (landfill, scrap yard, etc). These requested estimates are in IR form at the request of the Keeyask project managers.	MB Wildlands-0056	Please clarify whether transport of aggregate to site and within the project area (activity A21) is included in results presented in Table 15. If not included in scope, please provide an estimate of life cycle environmental effects or a reason for exclusion from analysis.	CEC Rd 2 MB Wildlands-0090	MWL-IR-090
								Please clarify whether transportation backhaul effects are included in analysis. If not included in scope, please provide an estimate of life cycle environmental effects or a reason for exclusion from analysis	CEC Rd 2 MB Wildlands-0091	MWL-IR-091

Department	Volume / Document	Line Number / Table Number / Figure Number	Page	Topic	Context / Preamble e.g., provide applicable background/rationale for providing the comment	Specific Department Comment / Request for Additional Information:	Round 1 Proponent Response	Round 2 Intervenor Question	Round 2 Response #	original intervenor IR#
MB Wildlands	PD SV	N/A	N/A	Project Description		<p>Operational stage of Keeyask facilities estimates required for LCA.</p> <p>1) Operational energy use estimates:</p> <ul style="list-style-type: none"> • for facilities • for reserve power, including system testing <p>2) Operational material use estimates:</p> <ul style="list-style-type: none"> • Need of oil, hydraulic fluids, and or fat, as well as potential emissions thereof to the waterways <p>3) Operational waste estimates:</p> <ul style="list-style-type: none"> • Amount, by type • Transportation distance and modes to handling/treatment/disposition <p>4) Maintenance estimates:</p> <ul style="list-style-type: none"> • Energy and materials use, eg. lubrication, inspection trips <p>These requested estimates are in the IR form at the request of Keeyask project managers.</p>	MB Wildlands-0054	Please provide the following model inputs: <ul style="list-style-type: none"> • Grid electricity and diesel consumption assumed for activity A42 (Generate Electricity). • Assumptions used to calculate laborer transportation effects (activity A16) not noted in Table 8, including number of laborers and trips. • Transportation distances and modes for materials sent to a recycling facility at end of life. Does the system boundary include concrete crushing (to produce aggregate) at end of life?	CEC Rd 2 MB Wildlands-0092	MWL-IR-092
MB Wildlands	PD SV	N/A	Table 2-1	Project Description		<p>1) Provide annual carbon stock estimates for all lands listed in Table 2.1 – for the current year, and each year in the project life cycle.</p> <p>2) Provide volume of wood entering manufacturing streams, for all logs and fibre removed from the project area.</p> <p>3) Provide volume of wood material to be cleared from the project area, and then burned. Provide for project construction period and the first 30 years of operation.</p> <p>4) Provide annual carbon stock estimates for no build scenarios.</p> <p>5) Provide annual land cover descriptions (plant species) for all lands affected by the project listed in Table 2.1 (both build and no build scenarios) to support estimates for albedo changes. Provide these annual land cover descriptions by zone, for all construction years, 30 years into project operation, and project life cycle.</p> <p>6) Add to this information any lands/land uses not listed in Table 2.1 (Quarries. Blasting eg)</p> <p>7) What data was used for landscape, peatland and forest cover?</p> <p>Manitoba Hydro Keeyask project managers indicated these requests should be forwarded in IR format.</p>	MB Wildlands-0059	<p>The LCA report does not provide the rationale for the assertion that 5,920 hectares will be affected by the project. Table 2.1 of the EIS Project Description volume notes that 8,786 hectares (13,824 ha – 5038 ha) will be affected by the project when one excludes the existing water surface area.</p> <p>1) What is the nature of the land requirement in the EIS Project Description such that it is not included in the calculation of land use impacts described in the LCA report?</p> <p>2) Explain how each of the hectares figures above, from the EIS, were arrived at?</p>	CEC Rd 2 MB Wildlands-0093	MWL-IR-093
MB Wildlands	R-EIS Guidelines	8.0 Monitoring and Follow-Up	N/A	Terrestrial Environment		<p>In the relevant Ecosystem Services literature, it is demonstrated that a historic and current lack of data exists to support informed decision making regarding ecosystem goods, services and natural capital assets. These data should also be used to inform the monitoring and management of the project:</p> <p>1) Does this long-term proposed monitoring program strive to adapt and correct this acknowledged scientific gap regarding natural capital within the project area?</p> <p>2) Does it strive to change as the information needs change for local and regional decision makers with regard to intensively managed flow regimes?</p> <p>a. If yes, please verify this by providing plans, methodologies, etc. that demonstrate this. If not, why not?</p>	MB Wildlands-0025	<p>“Existing water quality conditions” are used as a baseline and foundation for assessing the potential effects of the Project on water quality.</p> <p>In your response, it is stated that the following water quality functions and services were not relevant to the ESA:</p> <ul style="list-style-type: none"> • Water regulation • Water supply • Erosion control • Sediment retention • Waste treatment. <p>Explain your reasoning to why these components are not relevant to the ESA.</p>	CEC Rd 2 MB Wildlands-0095	MWL-IR-95
MB Wildlands	AE SV	2.3 Water Quality: Approach and Methods	2-2	Aquatic Environment	On page 2-2, it is stated “existing water quality conditions” are used as a baseline and foundation for assessing the potential effects of the Project on water quality. Given that the aquatic environment has already been substantially altered by hydroelectric developments, as described on page 6-54 in the Response to EIS Guidelines, please demonstrate ‘existing’ water conditions represent baseline conditions that are “suitable for aquatic life?”	<p>How is it demonstrated in the EIS that the existing conditions reflect properly functioning aquatic systems that facilitate the necessary water quality services such as water regulation, water supply, erosion control and sediment retention, and waste treatment?</p> <p>Have pre-alteration/ impoundment/ settlement conditions been considered for an alternative baseline as has been done in the IISD Environment Canada report: An Ecosystem Services Assessment of the Lake Winnipeg Watershed?</p> <p>If not, can you justify why you chose not to examine these conditions?</p>	MB Wildlands-0026a MB Wildlands-0026b			
MB Wildlands	AE SV	N/A	N/A	Aquatic Environment		<p>Food production by the local and regional area will be altered by changes in water quality.</p> <p>1) Has data been made available to quantify the change in freshwater fishery value associated with the change in water quality – nutrient concentrations in the project local or regional area?</p> <p>2) Has the financial Ecosystem Services/ biodiversity loss been quantified for subsistence fisheries? Have replacement costs been calculated?</p> <p>3) What is the cost of the price of the replacement food that it will take to bring in to the communities when the subsistence fishery declines, as predicted in the aquatic volume? Have these costs been quantified? This includes not only the price of food but the price of shipping the food and emissions of doing so, as well as the environmental costs of growing the food and bringing food into the territory in general (LCA of replacement food products?)</p> <p>4) Has this economic assessments been completed and appear in the EIS or supporting documents? Are they available to public? If this has not been done, explain.</p>	MB Wildlands-0057	<p>A value of food, which is derived from water (fresh or salt) has been linked indirectly to water quality in many cases. While it is acknowledged that ecosystem services and natural capital valuation of ecosystem services, such as the provision of food, is not currently standard practices in site level ESAs, it may become standard practice by the time the operation phase of Keeyask is ongoing.</p> <p>Please provide data you’ve collected which could support this type of analysis, historic and current.</p>	CEC Rd 2 MB Wildlands-0096	MWL-IR-096
						<p>Some habitats have more species, and thus more genetic diversity than others. One area of particular concern is genetic diversity of the lake sturgeon.</p> <p>2) Does the planned stocking program will take into account the need to preserve genetic diversity, and consequently biodiversity, of this endangered fish as per SARA and COSEWIC guidelines? Please and the methodology and supporting documentation used to come to these conclusions.</p>	MB Wildlands-0052b	<p>A concept of mitigation is that it is possible to compensate for impacts to ecosystem services at one site (the impact site) by replacing or increasing the same services at another site (the mitigation site). This is the strategy the project is using for habitat loss. A challenge in the use of off-site mitigation is assuring that ecosystem services, including wildlife habitat, produced by off-site mitigation are commensurate with on-site impacts.</p> <p>Recent increases in energy developments within Manitoba have raised concerns about impacts associated with these activities and efforts to mitigate those impacts. Has a metric system been developed to quantify impact losses and mitigation benefits for the proposed Keeyask project areas (local and regional)?</p> <p>If not, please advise as to where data that has been collected (past, present) and future monitoring plans address these mitigation metrics?</p> <p>While many countries require offset programs to balance the environmental degradation caused by development, these programs do not explicitly mitigate the impacts to people. Has this been considered in combination with biodiversity and water quality? Specifically, has the concept of a “serviceshed” been used at all in mitigation planning?</p>	CEC Rd 2 MB Wildlands-0097	MWL-IR-097

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MB Wildlands	TE SV	N/A	N/A	Terrestrial Environment	Maintaining biodiversity includes the control of populations, pests and diseases through trophic dynamic processes. This is a regulating ecosystem service.	Have the dynamics of local and regional ecosystems within the Keeyask areas, and their natural biological control, been mapped or examined spatially or temporally? Which studies, methodologies, data sets, and assessment approaches did Manitoba Hydro use to assess biodiversity and specifically services to maintain biodiversity? Where in the EIS is this addressed? Are there technical reports that support this assessment? If it was not done, what methodology was used instead? If Manitoba Hydro did not take any of these aspects into account, why not?	MB Wildlands-0004	The response directed reviewers to the Terrestrial Environmental Supporting Volume. Biodiversity is also an aquatic function and provides value necessary to all life. Please advise as to where ecosystem functioning, both aquatic and terrestrial has been assessed under changing environmental conditions. Ecosystem functioning should be considered under multiple environmental conditions. Please advise as to where these drivers and functions have been assessed together relating to biodiversity and specifically genetic diversity, in a cumulative manner, under multiple climate scenarios. Which metrics have been used to assess this? Please advise where in the EIS and supporting documents these metrics have been identified and explored.	CEC Rd 2 MB Wildlands-0098	MWL-IR-098
MB Wildlands	TE SV	N/A	N/A	Terrestrial Environment		Biodiversity is mentioned 2.7.1 Page 1. It refers to ecosystem, species and genetic diversity. 1) Have the genetic resources - such as medicine, products for materials, science, genes for plant resistance and crop pests been assessed and included in the EIS? 2) Have any data (point, spatial, etc.) been collected regarding these biodiversity goods and services? 3) Which studies, methodologies, data sets, and assessment approaches did Manitoba Hydro use for the genetic diversity affected by the project? 4) What was scientific literature and methodology was used in the assessment? Have these sources been made available to participants for review?	MB Wildlands-0029	In your response to 0029, ecosystem intactness is used as a proxy for biodiversity. "Servicesheds" is an emerging ecological concept where locations are identified that provide specific ecosystem services to specific beneficiaries. This could be used in combination with intactness. Please provide examples as to the past, current and future data and monitoring plans that could address this method and associated metrics.	CEC Rd 2 MB Wildlands-0099	MWL-IR-099
MB Wildlands	R-EIS Guidelines	4.3.3.2.3 Terrestrial Environment	N/A	Terrestrial Environment	On page 4-17, in Chapter 4, during mitigation discussions, the method employed for wetland mitigation will include the "Development of wetlands to offset potentially important wetlands". Wetlands serve many ecological functions which provide water quality ecological services such as the regulation of water flows, which purifies water; the filtering, retention and storage of fresh water; the maintenance of arable land and prevents water silting by lowering soil losses; and the removal, breakdown or abatements of pollution. In order to "offset" the important wetlands during mitigation, these specific services need to be assessed (preferably spatially and temporally quantified in GIS-mapped) in order to know what is being provided by the existing wetland function.	Which studies, methodologies, data sets, and assessment approaches did Manitoba Hydro use to assess the ecosystem services and functions provided by wetlands to be mitigated? Please provide verification of the basis for the planned mitigation activities via studies, methodologies, etc employed.	MB Wildlands-0001a	Please confirm that Manitoba Hydro has determine that 12 ha is sufficient for mitigation wetlands function loss as a result of Keeyask Generation Station. See para # 2 in response. A no net loss approach means no net loss of the amount and quality of an ecosystem elements or function. Does Manitoba Hydro maintain that only 12 ha of wetlands will be lost due to the Keeyask project?	CEC Rd 2 MB Wildlands -0100	MWL-IR-100
		4.3.3.2.3 Terrestrial Environment				Are these studies available to participants? Where water quality related ecosystem services and functions of these wetlands have been identified, quantified and mapped. Explain how mitigation will be accomplished.	MB Wildlands-0001b	It is unclear if ECOSTEM 2012 is part of the Manitoba Hydro filings. Is it among the technical reports not provided in the EIS filing in 2012? Or is it among the technical reports only available upon request as of late spring 2013?		
MB Wildlands	R-EIS Guidelines	4.0 Mitigation	N/A	Terrestrial Environment	In Chapter 4, the overall mitigation strategy for Keeyask is discussed. Rationale for developing areas to compensate for losses of habitats and ecosystems is often a strategy employed in development.	Are no-net loss of biodiversity or water quality part of this discussion? This compensation terminology is often used as a means of replacing sensitive habitat such as wetlands and species (i.e., sturgeon) but should be used to demonstrate the maintenance of not just the habitat, species and wetlands, but it should demonstrate that ecosystem services and biodiversity are not lost. Was this approach used in the Keeyask EIS? If not, why not? Please indicate how Keeyask restoration/mitigation plans look at restoring biodiversity/water quality ecosystem services and the natural capital that these ecosystems provide to the project and surrounding area.	MB Wildlands-0002a MB Wildlands-0002b	Please provide Manitoba Hydro and KCN definitions for: Ecosystem services, natural capital and mitigation.	CEC Rd 2 MB Wildlands -0101	MWL-IR-101
MB Wildlands	R-EIS Guidelines	4.0 Mitigation	4-16	Aquatic Environment	In Chapter 4, on page 4-16, it is stated that spawning habitat/ over wintering habitat channels will be created for fish movement, spawning feeding and overwintering. Every flow regime alters the biotic as well as abiotic aspect of the environment. It has been shown in studies testing flow regimes that habitat classification and recreation are often difficult to achieve under altered flow regimes when the optimum habitat has not been characterized for each flow.	1) If the recreation of habitat is a major mitigation strategy to replace lost habitat for several species of fish, have the characteristics of optimum habitats been quantified and mapped spatially at the different possible flow regimes of the project?	MB Wildlands-0003a	Please explain what 'nearly the full range of inflow' means in relation to scientific and technical information as the basis for this EIS. Is this in relation to the current environment (including all effects on flow of the Nelson River from hydro projects) or is it in relation to the former natural environment and river flows? Reference in the response to habitat suitability indices are provided. It is standard practice in reviews and regulatory processes for Class 3 licences under Manitoba's Environment Act to provide the details and methods used for an HAI. Are the indices referenced provided in the EIS, in the technical reports, in technical memoranda? If not provide these indices technical methodology materials to participants and the CEC.	CEC Rd 2 MB Wildlands-0102	MWL-IR-102
MB Wildlands	TE SV	N/A	Map 3-1	Terrestrial Environment	According to Map 3-1, the local study area for terrestrial plants encompassed an area that was 150 m outside of the predicted flooding zone during construction phase. The 150 m study area did not encompass the expected additional zone of influence on terrestrial plants during operation phase.	Answer the following questions: 1) What was the rationale behind selection of the Terrestrial Plant study area, given that the majority of the terrestrial plant study area overlaps with the predicted initial flooding area? 2) Why was 150 m selected as the buffer zone? Why did the buffer zone not include the expected additional zone of flooding? Provide scientific basis for 150m buffer. 3) How specific were the plant studies conducted in zone 4 and within the terrestrial plants regional study area? Provide list of plants for each. 4) The additional zone of influence within the terrestrial plant study area is vague in its description of time line and duration of impact and area. A better description of this impacted area is needed to provide periods of impact and the amount of area being influenced.	MB Wildlands-0006	Answers to the # questions within this IR are not provided. Explain what delimited means in paragraph # 2. What is the scientific basis for using the Project Footprint only to determine effects for the Terrestrial Plants? Were symbiotic relationships included in the effects assessment for plants? Were other species depend on specific plant species and / or specific plant habitat included in the assessment? If not, why not Does Manitoba Hydro have a standard for including related elements among species in the ecosystem or ecosystems which species inhabit? Is such a standard used in self assessment for licensing purposes?	CEC Rd 2 MB Wildlands-0103	MWL-IR-103
MB Wildlands	TE SV	Preliminary Environment Protection Program	N/A	N/A	The Environmental Protection Program (EnvPP) is referenced throughout the Keeyask EIS materials. Inspection of the EnvPP shows that many areas are incomplete, and program sections are separated, preventing assessment of the complete program and its overall efficacy.	Answer the following questions 1) When will a completed version of the EnvPP be available? 2) Will there be a component of the EnvPP that reviews all individual programs together to provide a thorough examination of program efficacy? 3) Will the EnvPP reports be available to public? 4) Will Manitoba Hydro bring detailed EnvPP information to the Keeyask CEC hearings?	MB Wildlands-0008	When will the Draft Fish Habitat Compensation Plan and Draft Aquatic Effects Monitoring Plan be available to the public, participants and the CEC?	CEC Rd 2 MB Wildlands-0104	MWL-IR-104
MB Wildlands	TE SV	1.3.6 Temporal Scope	N/A	Terrestrial Environment	The flooding of Gull Lake to create the Gull Lake reservoir for the Keeyask project, is compared to the Kettle Generation Station reservoir, Stephens Lake. It is stated that the Kettle reservoir stabilized after 30 years. The Kettle Generation Station was completed in 1974, now 39 years prior. Studies comparing the Keeyask and Kettle reservoirs were conducted between 2001 and 2011. The Kettle Generation Station is only 39 years old (up to 2013). How can Manitoba Hydro claim that the reservoir has stabilized after 30 years, when the studies evaluating the stability of reservoir were conducted at the 30-year operational mark? An additional 10 years or more would be required in order to conclude that no additional changes occurred within the reservoir.	Answer the following questions: 1) How are the Keeyask and Kettle reservoirs comparable, and give examples? 2) Please describe how a reservoir becomes stable, how is this measured, and are those measurements comparable to other reservoirs? Explain with regards to the Kettle reservoir. 3) What other Manitoba Hydro reservoirs can be compared with the Keeyask reservoir? 4) How long did it take other Manitoba Hydro reservoirs to stabilize, and what factors influence this? 5) What model was used to predict Keeyask reservoir stabilization? 6) Recalculate and provide the time required for the Keeyask reservoir to stabilize taking into account climate change, all other Manitoba Hydro current projects and future projects on the Nelson River, etc.	MB Wildlands-0073	Question 1: After 40 years of the Kettle Dam construction being completed... "Stephens Lake shorelines are still undergoing peatland disintegration from Kettle reservoir flooding." How is this considered a stable expansion process? This statement indicates that the shorelines of Stephens Lake continue to be altered by peatland disintegration. This change directly affects the immediate aquatic and terrestrial habitat. How will ongoing peatlands disintegration change the shoreline habitat dynamic in the proposed Keeyask reservoir? Question 2: "Reservoir expansion is expected to continue at the lower relatively stable long-term rate beyond year 30 of the project operation (i.e. expansion rate stabilizes, not reservoir size)." If the Keeyask reservoir is predicted to expand an extra 7 to 8 km2 during the first 30 years of the operation (due to shoreline erosion), how much of the shoreline will erode inland after, the "expansion rate stabilizes"?	CEC Rd 2 MB Wildlands-0105	MWL-IR-105

Department	Volume / Document	Line Number / Table Number / Figure Number	Page	Topic	Context / Preamble e.g., provide applicable background/rationale for providing the comment	Specific Department Comment / Request for Additional Information:	Round 1 Proponent Response	Round 2 Intervenor Question	Round 2 Response #	original intervenor IR#
MB Wildlands	TE SV	2.7.4 Project effects mitigation and monitorin	N/A	Terrestrial Environment	The EIS materials indicate there will be no net project effects to overall ecosystem diversity, stating that Keeyask activity will not change the total number of habitat types. The assessment for impacts to regional inland broad habitat composition of existing environment following construction is assessed for a 30 year period. Ecosystems are systems that do not draw lines between aquatic and terrestrial habitat types, meaning that a change to terrestrial ecosystems inevitably impacts aquatic ecosystems and vice versa.	Please answer the following questions: 1) Were the effects to ecosystem habitat diversity measured solely based on the number of habitats remaining after project construction? a. What are the baseline values used for ecosystem habitat diversity assessment? b. Did Manitoba Hydro review other measures of ecosystem diversity, aside from number of habitat types that are used for assessing effects to ecosystem diversity? c. Why was the study conducted to examine a 30-year period? 2) Did the terrestrial ecosystem effects mitigation and monitoring analysis incorporate changes and effects predicted for the aquatic environment? If not, why not? 3) Did Manitoba Hydro perform a project effects mitigation and monitoring analysis/report that includes both the terrestrial and aquatics information to assess future impacts, mitigation measures and monitoring practices for each terrestrial and aquatic ecosystem? a. Include information for 30, 50 and 100 years of the project lifespan.	MB Wildlands-0076	Question 1 C: "The quantitative prediction period was 30 years because project effects predictions were largely based on the examples provided by areas in Northern Manitoba that have already been affected hydroelectric development." How much terrestrial and aquatic environment in sq kilometers has been affected, directly and indirectly, by hydroelectric development in Northern Manitoba? What will the total area affect be on the terrestrial and aquatic environment including all current generation developments and the proposed Keeyask site combined? Why is the construction period, which occurs pre 30 years, omitted from the prediction period? Is this period of project effects excluded or omitted? Are transmission lines connected to generation infrastructure included in this report calculation? Over 30 years? Over construction and 30 years? Given that this 30 year impact period is simply the period of time the generation station and reservoirs have been operating, provide indication of how Manitoba Hydro will monitor effects for 40, 50, 60 years after operation begins. Construction for each installation and transmission infrastructure period should be clearly included or omitted. What models or tools does Manitoba Hydro use to compare effects between Hydro station, and reservoirs? Does Manitoba Hydro monitor and track effects of each installation in an ongoing manner? Who has access to this information?	CEC Rd 2 MB Wildlands-0106	MWL-IR-106
MB Wildlands	AE SV	1A.3 Keeyask Operation	N/A	Aquatic Environment	Over the operation period of the Keeyask Project, water levels will fluctuate to accommodate the peak mode operation mandate of the station. The Lake Winnipeg Water Regulation License is past due. Manitoba Hydro facilities are linked along the Nelson River and through the Churchill River Diversion (CRD) originating from Lake Winnipeg. The linked generation facilities impact one another, and therefore changes to Lake Winnipeg outflow is relevant to the operations of the Keeyask Generation Project.	Please respond to the following questions: 1) What are the intended min/max water levels within the Keeyask reservoir, spillway, Stephens Lake and forebay? 2) What are the anticipated 10, 20, 30, 40 and 50-year impacts of altered water levels on local topography and flooding? 3) How do the changing water levels within the Keeyask reservoir correlate with Lake Winnipeg Water Regulation requirements for water level regulation? 4) How will Keeyask affect other components of the CRD?	MB Wildlands-0079	Question 1: "The reservoir will fluctuate up to 1.0 m within any given day." Given a continuous fluctuation in water levels daily in the Keeyask reservoir, what will happen to the aquatic and terrestrial shoreline habitats as a result of 30 years of operation? Does all EIS content regarding effects take into account this 1.0 m fluctuation? What circumstances increase fluctuation to more than 1.0m?	CEC Rd 2 MB Wildlands-0107	MWL-IR-107
MB Wildlands	AE SV	2.3.3.2.1 Keeyask Environmental Studies	N/A	Aquatic Environment	The EIS materials state that additional baseline water quality data for the Keeyask study area was collected in 2009, but it was not incorporated into the description of the existing environment.	Please respond to the following questions: 1) Why was the additional baseline water quality data not incorporated into the description of the existing aquatic environment? Explain. 2) Provide the baseline aquatic data collected from 2009.	MB Wildlands-0082	Question 1: "The results of the 2009 water quality sampling program were compared to data collected in previous years and, because water quality was similar, a reanalysis of the full dataset was not undertaken." How did KHLP specifically determine that the water quality data collected from 2009 was comparable to other years and decide a re-analysis was not necessary? How will KHLP determine the status of water quality over time during planning, construction and operation in light of the gap in water quality analysis?	CEC Rd 2 MB Wildlands-0108	MWL-IR-108
MB Wildlands	R-EIS Guidelines	5.3.1 Regulatory Environmental Assessment Approach	N/A	Terrestrial Environment	Selection of 18 biophysical VECs was based on the following criteria: - Overall importance, value to people; - Key for ecosystem function; umbrella indicator; amendable to scientific study in terms of analysis of conditions; potential for substantial project affects; and regulatory requirements. The main benefits that humans obtain from healthy ecosystem functioning are actually provided by ecosystem services, not VECs. In the Executive summary, it is stated "that following mitigation none of the residual adverse effects exceeded the regulatory test for significance".	Did the development of VECs and exceedance of adverse effects included assessments pertaining to the ecosystem services and functions actually provided by the VEC.	MB Wildlands-0068	Answer to IR # 68 is a Referral to answer to CAC 0011 Question 1 Quote from CAC 0011 "Project specific guidelines for the environmental assessment of the Keeyask Generation Project were followed in the assessment of the project effects on the Physical Environment." The EIS Guidelines for the Keeyask Generation project indicate that: "The proponent must also indicate the specific geographical areas or ecosystems that are of particular concern to interested parties, and the relationship of these areas to the broader regional environment and economy." Explain how Manitoba Hydro fulfilled the EIS Guidelines requirement above given the reference to ecosystems, and the concerns of interested parties (CEC participants).	CEC Rd 2 MB Wildlands-0109	MWL-IR-109
MB Wildlands	TE SV	2.0 Habitat and Ecosystems	N/A	Terrestrial Environment	In table 2-1 (page 2-11) fine quality habitat types are discussed. Fine habitat types were used to address specialized needs of VECs. The study documents that extensive habitat classification and mapping was conducted, and occasionally to a fine scale.	1) Did the assessment goes the next level and provides how these classifications were used for environmental assessment? The VECs may not actually encompass the necessary services needed to maintain ecosystem function and biodiversity and the services provided. 1) Specifically, were biodiversity and ecosystem services identified for the habitats classified? Was this done, or it was not done, and why? Answer for both above. 2) Which assessment approaches did Manitoba Hydro use to classify these services and functions in order to address the specialized needs of the VECs? Are these studies available to participants?	MB Wildlands-0067	The Manitoba Hydro response indicates that : "fine habitat types were mapped in all areas....." Has Manitoba Hydro provided these maps, and the charted data to participants and the CEC ? " The VECs may not actually encompass the necessary services needed to maintain ecosystem function and the biodiversity and the services provided." Review answers to IRs from participants and the CEC regarding VECs, ecosystems, ecosystem services and functions, and biodiversity. Explain how Manitoba Hydro answers to these IRs agree with the statement above. " Specifically coarse habitat types were selected for beaver, moose, and caribou....." Does the coarse habitat type selected apply to all types of caribou known to use the RSA? Does the method described in the response to the IR only include " identification of calving and rearing habitat on islands" ? Does it include wintering areas and the winter food supply for caribou?	CEC Rd 2 MB Wildlands-0110a	MWL-IR-110
								CEC Rd 2 MB Wildlands-0110b		

Department	Volume / Document	Line Number / Table Number / Figure Number	Page	Topic	Context / Preamble e.g., provide applicable background/rationale for providing the comment	Specific Department Comment / Request for Additional Information:	Round 1 Proponent Response	Round 2 Intervenor Question	Round 2 Response #	original intervenor IR#
MB Wildlands	TE SV	1.4.3 Effect Benchmarks	N/A	Terrestrial Environment	The EIS materials indicate that there is no general or scientifically accepted benchmarks for assessing terrestrial VECs or Supporting Topics.	Answer the following questions: 1) If there are no general or scientifically accepted regulatory benchmarks for assessing terrestrial VECs or Supporting Topics, how are they assessed? a. Does Manitoba Hydro apply its own internal benchmarks? i. If so, what are those benchmarks and, how are they determined? b. Are the benchmarks used by Manitoba Hydro comparable between terrestrial VECs and Supporting Topics for Keeyask? Between other Manitoba Hydro projects? 2) What is a benchmark as it pertains to VECs and Supporting Topics?	MB Wildlands-0074	Ecosystem Benchmarks The reference provided for response to the IR is : Environment Canada 2012, Recovery Strategy for the woodland caribou, boreal population in Canada, 138 pgs. Manitoba Hydro is asked to specify which of the COSEWIC and SARA reports and technical documents regarding woodland caribou in Manitoba were used to answer this IR. (There are several reports.) Will Manitoba Hydro update its woodland caribou EIS content based on the final National Recovery Strategy? Question # 2 In response Manitoba Hydro used the term precautionary. Does Manitoba Hydro and the partnership think that its EIS contents and technical reports are precautionary, and apply the precautionary principle to the EIS Guidelines for Keeyask Generation?	CEC Rd 2 MB Wildlands-0111a CEC Rd 2 MB Wildlands-0111b	MWL-IR-111
MB Wildlands	TE SV	1.4.3 Effect Benchmarks	N/A	Terrestrial Environment	The EIS materials indicate that there is no general or scientifically accepted benchmarks for assessing terrestrial VECs or Supporting Topics.	Answer the following questions: 1) If there are no general or scientifically accepted regulatory benchmarks for assessing terrestrial VECs or Supporting Topics, how are they assessed? a. Does Manitoba Hydro apply its own internal benchmarks? i. If so, what are those benchmarks and, how are they determined? b. Are the benchmarks used by Manitoba Hydro comparable between terrestrial VECs and Supporting Topics for Keeyask? Between other Manitoba Hydro projects? 2) What is a benchmark as it pertains to VECs and Supporting Topics?	MB Wildlands-0074	We note the number of requests for definitions included in Participants' IRs, and the high number of conservation biology terms being used in responding to IRs. Where in the EIS materials is the glossary of all terms used in the EIS. Is there one single location for definitions of terms used in the IR? The Manitoba Hydro response indicates that a benchmark overall in project design was to "avoid increasing cumulative area losses to more than 10% of the pre development area for every high priority habitat type." Were high priority habitat types identified by zone, and by species need for the habitat types using steps kept independent of any decision to use the 10% benchmark ? Has this 10% benchmark also been applied to the LSA? Is it applied so that the planning, construction, and operation periods are included? Does the EIS contain a detailed listing of the habitat type review process, identification of the high priority, and priority habitat types, with location, etc? Was any peer review, or independent review system used to make sure that these two processes were done separately? Has Manitoba Hydro used the same threshold for any of the project assessment? Does this volume of the EIS contain definitions for the terms used in answering IR 74? Or are the definitions located in an all in glossary for the whole EIS? Are these conservation biology, and various benchmark terms all being used based on scientific definitions? If so, what is the source for these definitions?	CEC Rd 2 MB Wildlands-0112	MWL-IR-112
MB Wildlands	TE SV	2.0 Habitat and Ecosystems	Table 2-34	Terrestrial Environment	After 30 years of Keeyask project operation it is predicted the composition of inland habitat will not dramatically change according to the EIS materials. The table shows that after 30 years of operation total percent of land area will change from 98.5% (existing regional study area habitat types) to 97.8% (year 30 of operation in regional study area).	Answer the following questions: 1) What is the percent change of inland habitat over 30, 50 and 100 years within the local study area, regional study area and project footprint? 2) Did the model used to predict change of the inland habitat factor in climate change, increased human activity (having 2000 workers on site and using the surround environment), waste deposit, altered flow of Nelson River, infrastructure development, linear fragmentation by development of transmission lines, access roads, dykes, shoreline erosion and changes to wildlife population? 3) Will Manitoba Hydro provide an updated table on the changes to inland habitat from the Keeyask project factoring in the above-mentioned parameters? 4) Does inland habitat include all, any habitat types?	MB Wildlands-0077	Question 1 If 72% of the habitat change is expected to be in the Project Footprint explain how that relates to the LSA. What % of the LSA, and the Project Footprint inland habitat will be affected by Keeyask Generation project? Is the construction period left out of the "quantitative predictions for the first 30 years of Project operation, and qualitative predictions thereafter to year 100"? Or were the construction period effects on inland habitat calculated separately? Either way, what is the quantitative prediction of effect on inland habitat for the LSA and Project Footprint? 10 year period of construction effects, leaving out effects during the construction period? Does Manitoba Hydro include recovery of inland habitat in its prediction of effects, before fully identifying and predicting effects? That is, is recovery of habitat in the 30 year period, after and up to 10 year period of construction effects, leaving out effects during the construction period? What is the potential Project Footprint? Has the project footprint been determined yet? How are the effects of the previous infrastructure project – in a shared project area – included in the prediction of quantitative effects? Are monitoring results over 30 years included in the quantitative effects assessment?	CEC Rd 2 MB Wildlands-0113	MWL-IR-113
MB Wildlands	TE SV	2.7.4 Project effects mitigation and monitorin	N/A	Terrestrial Environment	The EIS materials indicate there will be no net project effects to overall ecosystem diversity, stating that Keeyask activity will not change the total number of habitat types. The assessment for impacts to regional inland broad habitat composition of existing environment following construction is assessed for a 30 year period. Ecosystems are systems that do not draw lines between aquatic and terrestrial habitat types, meaning that a change to terrestrial ecosystems inevitably impacts aquatic ecosystems and vice versa.	Please answer the following questions: 1) Were the effects to ecosystem habitat diversity measured solely based on the number of habitats remaining after project construction? a. What are the baseline values used for ecosystem habitat diversity assessment? b. Did Manitoba Hydro review other measures of ecosystem diversity, aside from number of habitat types that are used for assessing effects to ecosystem diversity? c. Why was the study conducted to examine a 30-year period? 2) Did the terrestrial ecosystem effects mitigation and monitoring analysis incorporate changes and effects predicted for the aquatic environment? If not, why not? 3) Did Manitoba Hydro perform a project effects mitigation and monitoring analysis/report that includes both the terrestrial and aquatics information to assess future impacts, mitigation measures and monitoring practices for each terrestrial and aquatic ecosystem? a. Include information for 30, 50 and 100 years of the project lifespan.	MB Wildlands-0076	Predicted expansion of the reservoir for 30 years, and the actual size of the reservoir at the 30 year point Is there expansion information available regarding the reservoir size for any, all reservoirs that are beyond 30 years in operation ? What is the 100 year figure based on? Do other Hydro utilities use these same assessment parameters?	CEC Rd 2 MB Wildlands-0114	MWL-IR-114

Department	Volume / Document	Line Number / Table Number / Figure Number	Page	Topic	Context / Preamble e.g., provide applicable background/rationale for providing the comment	Specific Department Comment / Request for Additional Information:	Round 1 Proponent Response	Round 2 Intervenor Question	Round 2 Response #	original intervenor IR#
MB Wildlands	R-EIS Guidelines	5.3.1 Regulatory Environmental Assessment Approach	N/A	Terrestrial Environment	Selection of 18 biophysical VECs was based on the following criteria: - Overall importance, value to people; - Key for ecosystem function; umbrella indicator; amendable to scientific study in terms of analysis of conditions; potential for substantial project affects; and regulatory requirements. The main benefits that humans obtain from healthy ecosystem functioning are actually provided by ecosystem services, not VECs. In the Executive summary, it is stated "that following mitigation none of the residual adverse effects exceeded the regulatory test for significance".	Did the development of VECs and exceedance of adverse effects included assessments pertaining to the ecosystem services and functions actually provided by the VEC.	MB Wildlands-0068	The response to this IR does not answer the IR question regarding exceedance of adverse effects. What regulatory test for significance is the proponent referring to? Is there a standard with respect to the size of the RSA and the LSA and proportion of a VEC affected? Which Manitoba Hydro uses? Does Manitoba Hydro use the same regulatory test for significance for all project assessments? Is there a guideline which project managers and consultants are directed to use? Given that mitigation steps are theoretical at this time, what does Manitoba Hydro use as a standard or guideline to determine whether mitigation actions in fact do keep the adverse environmental effects below the threshold for significance, therefore not demonstrating exceedance? What mitigation steps will Manitoba Hydro take should any mitigation steps not keep adverse effects from being significant? Will the Keeyask environmental and monitoring plans identify any exceedances of adverse effects, and put furthermeasures in place?	CEC Rd 2 MB Wildlands-0115	MWL-IR-115
MB Wildlands	R-EIS Guidelines	5.3.1 Regulatory Environmental Assessment Approach	N/A	Terrestrial Environment	Selection of 18 biophysical VECs was based on the following criteria: Overall importance, value to people; key for ecosystem function; umbrella indicator; amendable to scientific study in terms of analysis of conditions; potential for substantial project affects; and regulatory requirements. The main benefits that humans obtain from healthy ecosystem functioning are actually provided by ecosystem services, not VECs. In the Executive summary, it is stated "that following mitigation none of the residual adverse effects exceeded the regulatory test for significance."	How is it being proposed that the development of VECs and exceedance of adverse effects included assessments pertaining to the ecosystem services actually provided by the VEC?	MB Wildlands-0064	The response from Manitoba Hydro refers to ecosystem services. Given responses to other Participant IRs regarding VECs, and Biodiveristy which requested responses about ecosystem services Manitoba Hydro should provide its identification of the ecosystem services in the RSA and the LSA. The reference to CAC 0011 maintains that effects assessment for each VEC captures cumulative effects to ecosystem services. Manitoba Hydro is asked to provide two examples, with the steps taken for two VECs that "captures cumulative effects to the ecosystem services" through the effects assessment for those VECs.	CEC Rd 2 MB Wildlands-0116	MWL-IR-116
MB Wildlands	TE SV	1.3.5 Spatial Scope	Map 1-1 and Table 1-3	Terrestrial Environment	Study zones 1-6 were applied to the terrestrial environment to define areas for field work, research and comparison. Around each study zone, an additional buffer was applied that has a variable width depending on the zone. Each terrestrial VEC was evaluated in a local and regional study zone, however the local and regional study zones varied between VECs.	1. What criteria were used to establish each terrestrial study zone? If no criteria were used, why not? 2. What criteria were used to establish each terrestrial study zone buffer area? If no criteria were used, why not? 3. How was the area and amount of land determined for each study zone and corresponding buffer area? 4. Was there a model used to establish study zones and buffer areas? a. Is each zone/buffer area representative of a certain percent of the entire project study area? b. Are there certain terrestrial characteristics that were required within each zone and buffer area? c. How were the study zones and buffer areas determined and utilized to maximize/enhance VEC assessment?	MB Wildlands-0072	Question 1: " descriptions regarding how the study zones were delineated, please see the Terrestrial Supporting Volume." Specifically provide the location where the Terrestrial study zoning criteria can be found.	CEC Rd 2 MB Wildlands-0117	MWL-IR-117
MB Wildlands	AE SV	N/A	N/A	Aquatic Environment	Water bodies act as large natural sinks for sequestering anthropogenic carbon emissions. Carbon enters the aquatic environment in the form of dissolved carbon dioxide (CO2), which then binds to calcium carbonates for sequestering. Dissolved CO2 increases the acidity of the aquatic environment, which in turn slows calcium carbonate precipitation, thereby decreasing the ability of the water to absorb CO2. Vertical deep mixing is a mechanism that then transports the sequestered carbon to the deeper layers of the water column Aquatic plants play a significant role absorbing dissolved carbon by converting it to organic material, and mitigating aquatic acidification by converting CO2 to oxygen during photosynthesis. In general, water bodies play a significant role in the carbon cycles of the earth and in local ecosystems, and must be considered when evaluating the impacts of carbon emissions on the environment (terrestrial and aquatic).	1. How will carbon emissions produced by the Keeyask Project during both the construction and operation phases impact water carbon cycles? 2. What type of carbon inventory does Manitoba Hydro conduct regarding lakes, rivers, peatlands and reservoirs; its projects areas?	MB Wildlands-0084	Please refer to response to CEC Rd 1 PFN-0024 Section 2.5.2.2.6 : "There is some indication that DOC increased in the offshore area of the north arm of Stephens Lake in the initial years post-flood, but concentrations measured in recent years in the offshore area are similar to those measured in the southern area of the lake and other sites on the Nelson River." If the southern area of the lake and other sites on the Nelson River were affected by reservoir flooding as well, how are the measurements comparable? If they are comparable then is there data related to this statement that is current and not from early 1970's? Are Manitoba Hydro water quality and aquatic testing, monitoring and concentration measurements only comparisons to aquatic areas previously affected by Hydro Development?	CEC Rd 2 MB Wildlands-0118	MWL-IR-118
Manitoba Metis Federation										
						Describe what statistical analyses or comparisons were completed for ungulates for the Project and provide the results.	MMF-0001a	The Partnership provides reference to descriptive statistics (e.g. mean, median, frequency, standard error) in Appendix 7B that were used to summarize the data, but these have not been formally compared using mathematical statistical analysis. Therefore, we assume from the Partnership's response that all comparisons of summarized data for the Keeyask impact assessment are qualitative in nature. The Partnership also references a document that is not yet available for review: Habitat Relationships and Wildlife Habitat Quality Models for the Keeyask Region. Will the Partnership commit to provide this report for review by the MMF once available (expected late summer 2013)?	CEC Rd 2 MMF-0040a	MMF-0001a

Department	Volume / Document	Line Number / Table Number / Figure Number	Page	Topic	Context / Preamble e.g., provide applicable background/rationale for providing the comment	Specific Department Comment / Request for Additional Information:	Round 1 Proponent Response	Round 2 Intervenor Question	Round 2 Response #	original intervenor IR#
MMF	TE SV	1.4.6 Sources of Information; 7.5.1 Mammal Sign Surveys	1-27, 7A-7, 7-7, Map 7-2	Terrestrial Environment	<p>EIS Scoping Document Reference: 4.1.3.6 Mammals: "The EIS will describe the following attributes in the applicable study area(s): ..Species composition, distribution and relative abundance of small mammals, furbearers, large carnivores and ungulates, in relation to habitat including seasonal changes."</p> <p>The Scoping Document (Section 4.1.3.6) sets out that the EIS will describe the composition, distribution, and relative abundance of ungulates. Appendix 7A makes reference to "statistical comparisons" with collected data (TE-SV-7.0, Appendix 7A, p. 7A-7); however, no analyses or statistical comparisons are presented in TE-SV-7.0 or Appendix 7A. It appears the study design for the Project included both "proxy" and "benchmark" areas (TE-SV-1.0, Section 1.4.6, p. 1-27) which can be useful for comparison to areas that have experienced similar project impacts and relatively pristine areas that will presumably remain pristine. However, the mammals report (TE-SV-7.0) does not appear to contain any results of comparisons utilizing data from the proxy and benchmark areas. With sufficient sample size, analyses should demonstrate the effectiveness (or ineffectiveness) of mitigation measures applied to previous hydroelectric projects. Analyses should also demonstrate that benchmarks function effectively as control sites (i.e., not impacted by hydroelectric activity and similar in nature to Project study area at baseline).</p>	Indicate if analyses performed provide support for proposed Project mitigation measures for ungulates.	MMF-0001b	<p>The support presented for proposed mitigation measures is not statistically rigorous. Based on the Partnership's response to CED Rd 1 MMF-0001a, we assume that all comparisons of summarized data for the Keeyask impact assessment are qualitative in nature. Some of the support appears to be reliant on information not yet available for review (Habitat Relationships and Wildlife Habitat Quality Models for the Keeyask Region) and, as such, cannot be verified. The Partnership indicates that mitigation includes the implementation of the CNP Moose Harvest Sustainability Plan (MHSP). As this plan has only just been made available for review, we have some information requests specific to the plan:</p> <p>While First Nations residents provided information on moose taken for domestic harvest, no mention is made regarding Metis harvest. Without Metis data, moose harvest numbers for the model in the MHSP may be underestimated which could result in an overestimate of available moose for harvest (and subsequently could result in a permitted overharvest in future years).</p> <ul style="list-style-type: none"> • Was information on Metis moose harvest gathered for use in the MHSP? <p>We appreciate that the MHSP acknowledges that more information would contribute to "a more detailed and accurate picture of the overall system" (MHSP, Appendix C, p. 41).</p> <ul style="list-style-type: none"> • What is the confidence that the model in the MHSP will be successful in mitigating the impacts of the Keeyask project, particularly given that it appears that Metis information has not yet been incorporated? <p>The plan states that "With respect to the allowable harvest by all hunters, the projected total sustainable harvest is probably a good management guideline, but it can only be implemented if there is a formal recording of all moose taken by all hunters, licensed and First Nations." (Appendix C, p. 41)</p> <p>With the possibility that reporting of moose kills does not achieve the expected goals, what is the level of confidence that the projected total sustainable harvest numbers will function as a good management guideline and, subsequently, that the Plan will be effective mitigation for Keeyask Project effects on moose?</p>	CEC Rd 2 MMF-0040b	MMF-0001b
						Provide power analyses demonstrating that sufficient sample sizes for tracking data were collected at baseline such that meaningful comparisons with future monitoring data can be made.	MMF-0001c	<p>In its response, the Partnership refers to a document that is not yet available for review (Habitat Relationships and Wildlife Habitat Quality Models for the Keeyask Region). Therefore, it is still not clear if and how "proxy" and "benchmark" areas were used in any data comparisons.</p> <ul style="list-style-type: none"> • Please see follow-up question from CEC Rd 1 MMF-0001a [see CEC Rd 2 MMF-0040a]. • Will a power analysis be completed to determine whether sufficient baseline data have been collected to detect any differences in future analyses (in future monitoring programs)? 	CEC Rd 2 MMF-0040c	MMF-0001c
MMF	TE SV	7.2.5.1, 7.3.6, 7.4.6.2.1, 7.4.6.2.2, 7.5.1	7-7, 7-57, 7-75, 7-112, 7-120, 7-124	Terrestrial Environment	<p>EIS Scoping Document Reference: 4.1.3.6 Mammals: "The EIS will describe the following attributes in the applicable study area(s): ..Species composition, distribution and relative abundance of small mammals, furbearers, large carnivores and ungulates, Page 8 in relation to habitat including seasonal changes."</p> <p>The Scoping Document (Section 4.1.3.6) sets out that the EIS will describe the composition, distribution, and relative abundance of ungulates. The EIS states that additional efforts were made to design studies and collect sufficient data to construct and validate "statistically derived multivariate habitat models" for mammal VECs (TE-SV-7.0, Section 7.2.5, p. 7-7). Section 7.3.6.1 discusses "expert information models" that were used to estimate the abundance of habitat available pre- and post-Project. The expert information models are described as being based on scientific literature and expert information (not statistically derived). Section 7.3.6.3.4 contains a Caribou Habitat Model discussion and Section 7.3.6.4.4 contains a Moose Model discussion; however, neither appear to be "statistically derived", nor do they appear to be statistically validated. Appendix 6A of the Response to EIS Guidelines lists an Environmental Study Report titled "Habitat relationships and wildlife habitat quality models for the Keeyask region" but does not provide a status or date completed.</p> <p>The habitat model discussions require some additional information. It is critical to explain how suitability of islands and peatland complexes for calving caribou was determined as this information feeds into the impact assessment. The EIS states "Evidence of calving was documented on approximately 10% of the island in Gull and Stephens lakes and only 5% of the peatland complexes surveyed in 2010 and 2011, indicating that there is likely more habitat available than caribou are currently using." (TE-SV-7.0, Section 7.4.6.2, p. 7-112). Alternatively, this may indicate that the unused islands and peatland complexes may have characteristics that result in caribou avoidance of these sites. Since the EIS also identifies important moose calving and rearing habitat in the LSA to be similar to those used by summer resident caribou (TE-SV-7.0, Section 7.4.6.3.1, p. 7-124), the assumption that more calving habitat is available needs to be supported for moose as well. Project impact predictions require more consistent argumentation and clarity and support for assumptions made within the presented arguments.</p>	Provide the reference to sections where the details on how "statistically derived multivariate habitat models" for caribou and moose were generated and validated.	MMF-0002a	<p>The Partnership references a document that is not yet available for review: Habitat Relationships and Wildlife Habitat Quality Models for the Keeyask Region. Presumably this document will contain details of caribou and moose model generation and validation procedures as the Partnership's response provides little new information.</p> <p>Please see follow-up question from CEC Rd 1 MMF-0001a [see CEC Rd 2 MMF-0040a].</p>	CEC Rd 2 MMF-0041a	MMF-0002a
						Provide the status or date completed for the Environmental Study Report titled "Habitat relationships and wildlife habitat quality models for the Keeyask region". If available, please provide the report to the Métis for review.	MMF-0002b	<p>Please see follow-up question from CEC Rd 1 MMF-0001a [see CEC Rd 2 MMF-0040a].</p>	CEC Rd 2 MMF-0041b	MMF-0002b
						Provide support for the assumption that "there is likely more habitat available than caribou are currently using". How was suitability of islands and peatland complexes for caribou and moose calving determined?	MMF-0002c	<p>The Partnership's response contains qualitative information to support their conclusions. For example, the Partnership states that "...it was apparent that higher rates of use were evident for larger islands in lakes and peatland complexes", but does not indicate if this is a statistically significant difference in use. The Partnership repeatedly refers to "comparisons" that have been made, but it appears these comparisons are all qualitative in nature. Alternatively, perhaps more detailed quantitative information will be contained within the, as yet, unavailable report: Habitat Relationships and Wildlife Habitat Quality Models for the Keeyask Region. The quantitative information being requested is critical for understanding and supporting the series of arguments leading to conclusions regarding significance of impacts. Without it, conclusions could be biased.</p> <p>Please see follow-up question from CEC Rd 1 MMF-0001a [see CEC Rd 2 MMF-0040a].</p>	CEC Rd 2 MMF-0041c	MMF-0002c
						Explain the concept of "regulatory significance" and provide reasoning and references for its use in environmental impact assessment.	MMF-0003a	<p>Please clarify whether the concept of "regulatory significance" indicates that the regulators agree with the benchmarks used by the Partnership to determine significance.</p>	CEC Rd 2 MMF-0042a	MMF-0003a
						Present data outlining the range of natural variability (RNV) and thresholds in moose and caribou populations (i.e., provide upper and lower targets in moose and caribou populations, beyond which adaptive management action would need to be implemented) that are being used to determine magnitude. Explain how one determines whether effects are "marginally" vs. "well-beyond" guidelines or the range of natural variability.	MMF-0003b	<p>The Partnership does not have adequate data to describe the RNV for moose and summer resident caribou and the presence of migratory caribou are too variable in the regional study area. Therefore, the Partnership must rely on other criteria considered to determine the magnitude of the Project effects. "The magnitude of Project effects on moose and caribou was determined using benchmarks (TE SV Section 7.2.6), including physical habitat loss, intactness, linear feature density, gray wolf density, and harvest. If a benchmark is exceeded, additional mitigation or action may be considered, whether effects are marginally or well beyond guidelines."</p> <p>Please see follow-up questions under CEC Rd 1 MMF-0006b [see CEC Rd 2 MMF-0045b].</p> <p>As the MHSP has only just been made available for review, we have some information requests specific to the plan: Please see follow-up questions under CEC Rd 1 MMF-0001b above regarding the MHSP. [see CEC Rd 2 MMF-0040b].</p>	CEC Rd 2 MMF-0042b	MMF-0003b

Department	Volume / Document	Line Number / Table Number / Figure Number	Page	Topic	Context / Preamble e.g., provide applicable background/rationale for providing the comment	Specific Department Comment / Request for Additional Information:	Round 1 Proponent Response	Round 2 Intervenor Question	Round 2 Response #	original intervenor IR#
MMF	TE SV	Section 1.4.4; 5.5 (Response to EIS Guidelines)	1-24; Figure 5.1, p. 5-9 (Response to EIS Guidelines)	Terrestrial Environment	Effects that are easily observable, measured and described (i.e., readily detectable without a monitoring program), and well beyond guidelines or established thresholds of acceptable changes, are well beyond the range of natural variability, or are well beyond minimal impairment of an ecosystem component's functions". (R to EIS, Section 5.5, p. 5-11). This implies that the ranges of natural variability (RNV) of populations are known. The current presentation of data for moose and caribou does not clearly indicate the RNV. The "Reversibility" criterion is only considered in "Step 2" of the regulatory significance assessment for those VECs that have an adverse effect and meet particular criteria (R to EIS, Section 5.3.1; Scoping Document 5.1.1). Reversible is defined as an "Effect that is reversible during the life of the Project" (R to EIS, Section 5.3.1). All borrow areas (except portions of G-1 and G-3), all road footprints (except the north and south access roads and Butnau road upgrades), camp, work, and landfill areas would be decommissioned at the end of construction (TE-SV-1.0, Section 1.5.1, p. 1-30 to 1-31). Under operations, camp, work, borrow, other temporarily cleared areas (TE-SV-1.0, Section 1.5.2, p. 1-32), and material placement areas will undergo some degree of rehabilitation (R to EIS, Section 4.6.16, p. 4-40). Unfortunately, "a detailed decommissioning and rehabilitation plan for infrastructure not required for the operation of the Project will be developed during the construction phase and provided to regulators for review and approval" (R to EIS, Section 4.6.16, p. 4-41). Without a rehabilitation plan, it is difficult to evaluate whether those areas identified for rehabilitation will meet the reversibility criterion or whether the duration ("Step 1") of effects was accurately assessed.	Identify and describe the rehabilitation target (time frame and vegetation target) and demonstrate that this target has been achieved elsewhere. Clarify if sites that are to be rehabilitated are considered "reversible" and if they are "medium-term" or "long-term" (i.e., how was rehabilitation considered in the determination of impact significance). If no examples of successful rehabilitation can be provided, re-assess impacts considering that sites cannot be rehabilitated.	MMF-0003c	The Partnership has not demonstrated that the vegetation targets have been achieved elsewhere, as requested in the original IR. While the Partnership indicates that the assessments used the total area of habitat affected prior to rehabilitation when determining the magnitude of effects on VECs, it is still unclear how reversibility and duration were predicted. The Partnership indicates that timeframes for rehabilitation depend on the target vegetation type which will not be determined until the completion of the Keeyask Generation Project Vegetation Rehabilitation Plan. The Partnership indicates that determination of reversibility would be made after rehabilitation (i.e., successful rehabilitation = reversible; unsuccessful rehabilitation = irreversible). We expect that a reversible impact on vegetation would mean the return to pre-disturbance conditions. If any vegetation type other than pre-disturbance condition is established, then the impact has not been reversed, particularly from a wildlife habitat point of view. • Without the timeframe for rehabilitation, how did the Partnership determine whether duration of an effect was Medium-term vs. Long-term? • How did the Partnership make conclusions about significance in "Step 2" if one of the criteria (reversibility) is not given a value until some, as yet to be determined, date in the future? If the Partnership has not already done so, re-assess impacts considering that sites cannot be rehabilitated (i.e., long-term duration and irreversible). The Partnership does not have site-specific target vegetation types and time frames developed at this time. These will be provided in the Keeyask Generation Project Vegetation Rehabilitation Plan. • Will the Partnership commit to provide this report for review by the MMF once available? • Will this report provide quantitative definitions of rehabilitation, outline revegetation, and off-system marsh success?	CEC Rd 2 MMF-0042c	MMF-0003c
MMF	TE SV	7.2.4.1 Aboriginal Traditional Knowledge, 7.4.6.2.2 Caribou - Operation	7-5, 7-114	Terrestrial Environment	EIS Scoping Document Reference: 5.1 Project Effects: "In reporting on the assessment of potential environmental effects, the EIS will describe the approach and methods used to identify and assess the effects, and it will also provide a record of assumptions and analyses that support the conclusions." The Scoping Document (Section 5.1) sets out that assumptions and analyses that support conclusions regarding Project effects will be described. With respect to conclusions about the impact of Project related disturbance on caribou, the EIS does not present or reconcile differing statements when making conclusions about Project impact. The EIS states that "They [caribou] will often return to disturbed areas once the disturbance ends" and "Caribou show a high level of site fidelity and do not readily abandon suitable areas due to disturbance unless they are actively pursued (Tucker and Mahoney 1990; Dyke 2008)" (TE-SV-7.0, Section 7.4.6.2.2, p. 7-114). However, KCNs noted that caribou are only now just returning to the local region since Kettle GS was constructed and that the Kettle GS changed the landscape (TE-SV-7.0, Section 7.2.4.1, p. 7-5). Construction of the Kettle GS was completed in 1974 and the date of this KCN comment is 2012 (TE-SV-7.0, Section 7.2.4.1, p. 7-5). The Partnership has committed to monitoring to verify the prediction that impacts to calving and rearing habitat (and thereby caribou populations) in the RSA will likely be negligible to small. However, the impact assessment would benefit from any support that can be provided by existing monitoring data from other GS's in the same watershed given the discrepancy between KCN observations and The Partnership's impact assessment. There are at least four other GS's on the Nelson River that should have data that could be used to inform this impact assessment.	Demonstrate that previously disturbed sites would be in pre-disturbance condition as far as human and predator access is concerned such that caribou would exhibit site fidelity.	MMF-0004a	The Partnership indicated that "Some caribou may avoid the area during construction, and others may remain despite the disturbance. Some of those that avoid the area are expected to return once the disturbance ends". They also indicated that "This prediction is currently being monitored at the Wuskwatim generating station, where caribou still used calving habitat during construction in the area 2-4 km from the access road and borrow areas." It appears that no quantitative evidence is yet available to support this prediction. Monitoring programs will have to confirm these impact predictions for caribou. No further questions at this time.	CEC Rd 2 MMF-0043a	MMF-0004a
						Can monitoring data from other projects be used to support this prediction, particularly given the discrepancy between KCN observations and The Partnership's impact assessment? Longer term results from monitoring programs for existing GS's should be used to inform the impact assessment.	MMF-0004b	The Partnership indicates that caribou still used calving habitat during construction of the Wuskwatim generating station. The article provided by the Partnership, Mahoney and Schaefer (2002), concluded that the hydroelectric development caused disruption of migration during construction and in the longer-term diminished caribou use of the range surrounding the project site. The Partnership does not have any technical monitoring data from GS's that have been operating longer than the Wuskwatim generating station that could be used to evaluate the conclusion regarding longer-term impacts to caribou, as was requested in the original IR. The Partnership's conclusion regarding impacts to caribou in the RSA seems to be counter to observations by the KCN and by Mahoney and Schaefer (2002) and the Partnership did not provide the quantitative monitoring information required to make an informed decision about the effectiveness of past mitigation/management measures. No further questions at this time.	CEC Rd 2 MMF-0043b	MMF-0004b
MMF	TE SV	7.4.6.2.1, 7.4.6.2.2 Valued Environmental Components - Caribou	7-113, 7-116, 7-121	Terrestrial Environment	EIS Scoping Document Reference: Attachment C: "The Keeyask Generation Project (the Project) involves the operation of the following permanent infrastructure constructed as part of the Keeyask Infrastructure Project (KIP): North access road, including a clear-span bridge over Looking Back Creek and an upgrade at the intersection of the road." (Attachment C, Scoping Document); 5.1 Project Effects: In reporting on the assessment of potential environmental effects, the EIS will describe the approach and methods used to identify and assess the effects, and it will also provide a record of assumptions and analyses that support the conclusions." The Scoping Document (Attachment C) indicates that the Keeyask Project requires use of the North access road and that the EIS will describe the approach and methods used to identify and assess Project effects (Section 5.1). With respect to the assessment of sensory disturbance and mortality on caribou, the EIS does not adequately describe the linkages between caribou and the changes caused by the Project during construction and operations. During construction, the EIS considers sensory disturbance and mortality due to wildlife-vehicle collisions on the south access road (TE-SV-7.0, Section 7.4.6.2.1, p. 7-113). It does not appear that the north access road was considered as an impact on sensory disturbance and mortality for caribou during construction, even though it will be the main access route to the GS during construction and will likely receive higher human use than pre-Project (TE-SV-7.0, Section 7.4.6.2.1, p. 7-116). Under the operations scenario, both the north and south roads are considered and the EIS predicts that the risk of wildlife-vehicle collisions is unlikely to change (TE-SV-7.0, Section 7.4.6.2.2, p. 7-121).	Re-assess the loss of effective habitat in the LSA considering the north access road during construction.	MMF-0005	Information request satisfied. The Partnership corrects a typographical error.	CEC Rd 2 MMF-0044	MMF-0005a
						Assumptions requiring verification: o Are all of the summer resident caribou actually coastal caribou? o Is the unused calving and rearing habitat in the RSA suitable? o Is the proportion of undisturbed habitat greater beyond the RSA such that the 65% benchmark of undisturbed habitat is met? (What is the estimate of undisturbed habitat beyond the RSA? What area beyond the RSA is measured and considered in this assessment on caribou?)	MMF-0006a	Regarding summer resident caribou being coastal caribou, it is understood that there is uncertainty thus casting uncertainty on the impact predictions. An estimate of undisturbed habitat beyond the RSA was provided for the Pen Islands caribou summer range. We assume this is the range outlined in Figure 7-21 of TE-SV-7.0. Regarding the suitability of unused calving and rearing habitat, please refer to response under CEC Rd 1 MMF-0002c [see CEC Rd 2 MMF-0040a].	CEC Rd 2 MMF-0045a	MMF-0006a

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MMF	TE SV	7.4.6.2.1 Valued Environmental Components - Caribou; Chapter 6, Section 6.5.8.1.1 Construction Effects and Mitigation - Caribou (Response to EIS Guidelines)	7-117; 6-369	Terrestrial Environment	EIS Scoping Document Reference: 5.1 Project Effects: "In reporting on the assessment of potential environmental effects, the EIS will describe the approach and methods used to identify and assess the effects, and it will also provide a record of assumptions and analyses that support the conclusions." The Scoping Document (Section 5.1) sets out that assumptions and analyses that support conclusions regarding Project effects will be described. However, the EIS does not present adequate support for assumptions or premises when making predictions about Project impact on summer resident caribou. Furthermore, there is an inconsistency in the scale at which analyses are conducted and the scale at which conclusions are made. The EIS states that "Because some of the summer resident caribou are likely coastal caribou, caribou are not using all of the calving and rearing habitat currently available in the Regional Study Area, and the proportion of undisturbed habitat is greater beyond the Regional Study Area, the effect of habitat disturbance on summer resident caribou is predicted to be small" (TE-SV 7.0, Section 7.4.6.2.1, p. 7-117). The EIS discusses a 65% undisturbed habitat benchmark, as recommended in the draft caribou recovery strategy (Environment Canada 2011; final version now available: Environment Canada 2012), in reference to the above impact prediction on boreal woodland caribou. There are some assumptions in the above quote from the EIS that should be verified to support the prediction. Also, there is some confusion about the Zone being considered in this impact prediction. Zone 4 is the caribou LSA, Zone 6 is the caribou RSA, and Zone 5 was used to assess Intactness (the degree to which a geographic area has not been subdivided into smaller areas by human features (TE-SV-7.0, Section 7.2.6.2, p. 7-9)). According to the EIS, Zone 5 is currently 48% intact or undisturbed and 36% of Zone 5 is less than 40 years old (R to EIS, Section 6.5.8.1.1, p. 6-372), but no similar estimates are provided for the caribou LSA or RSA. Furthermore, reference is made to undisturbed area "beyond the RSA" in the above quote, but no estimate of undisturbed area is provided. With the information provided and using the 65% undisturbed habitat benchmark (Environment Canada 2012), it appears that an insufficient amount of undisturbed habitat is currently available to support a sustainable woodland caribou population in Zone 5 (48% undisturbed). The conclusion of "small" Project impact is based on a scale ("beyond the RSA") for which no measures were provided. Given that the amount of undisturbed habitat available in Zone 5 is below the recommended 65% in the recovery strategy, any contribution, however small, could have negative repercussions on the long-term viability of the population (See MMF IR #19 and 22).	Assess the effect of habitat disturbance on summer resident caribou for the defined caribou study areas. Alternatively, justify the selection of a larger study area than the caribou RSA as the basis for the predicted impact on summer resident caribou and provide associated measure of intactness.	MMF-0006b	The Partnership presents revised calculations for summer resident caribou. They present new calculations of disturbed habitat based on Study Zone 6 (RSA) and Study Zone 5, making adjustments to the calculation method based on Environment Canada (2012). Study Zone 5 was described as being more appropriate to assess changes in intactness on a summer resident caribou population hypothesized to be boreal woodland caribou, while Study Zone 6 was chosen as the regional study area for all caribou types to account for the large ranges of migratory herds. Overall, there is uncertainty regarding the exact core range of summer resident caribou and uncertainty as to whether they are coastal, boreal woodland, or a mixture of both caribou types. The amount of undisturbed habitat with the Project within Zone 5 is now 63.9% (36.1% disturbed) and within Zone 6 is now 65.8% (34.2% disturbed). The benchmark identified in the caribou recovery strategy (Environment Canada 2012) is 65% undisturbed habitat. The 65% undisturbed habitat threshold provided by Environment Canada (2012) is a minimum threshold "because at 65% undisturbed habitat there remains a significant risk (40%) that local populations will not be self-sustaining." Depending on how the summer resident caribou herd is defined, the impact of the project either results in an exceedance of the EC benchmark (Zone 5 calculation) or close to an exceedance (Zone 6 calculation). Given that: o the amount of undisturbed habitat available in Zone 5 is below the recommended 65% in the recovery strategy o the amount of undisturbed habitat available in Zone 6 is within 0.8% of the recommended 65% in the recovery strategy The Partnership presents revised calculations for summer resident caribou. They present new calculations of disturbed habitat based on Study Zone 6 (RSA) and Study Zone 5, making adjustments to the calculation method based on Environment Canada (2012). 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Depending on how the summer resident caribou herd is defined, the impact of the project either results in an exceedance of the EC benchmark (Zone 5 calculation) or close to an exceedance (Zone 6 calculation). Given that: o the amount of undisturbed habitat available in Zone 5 is below the recommended 65% in the recovery strategy o the amount of undisturbed habitat available in Zone 6 is within 0.8% of the recommended 65% in the recovery strategy o the uncertainty regarding the exact core range of summer resident caribou and uncertainty as to whether they are coastal, boreal woodland, or a mixture of both caribou types there could be significant negative repercussions on the long-term viability of the summer resident caribou population. Please explain why a 35-40% disturbed habitat (60-65% undisturbed habitat) only corresponds to a moderate magnitude effect give the associated risk of the population not being self-sustaining at 65% undisturbed habitat.	CEC Rd 2 MMF-0045b	MMF-0006b
						Explain why no measures of undisturbed habitat are provided for the caribou LSA and RSA? (What data are used as the foundation of the impact assessment for habitat disturbance on summer resident caribou?)	MMF-0006c	Information request satisfied. Measures are provided for the RSA.	CEC Rd 2 MMF-0045c	MMF-0006c
MMF	TE SV	7.4.6.2.2 Valued Environmental Components - Caribou	7-121 to 7-122; 78-79 (FLCN 2012)	Terrestrial Environment	EIS Scoping Document Reference: 5.1 Project Effects: "In reporting on the assessment of potential environmental effects, the EIS will describe the approach and methods used to identify and assess the effects, and it will also provide a record of assumptions and analyses that support the conclusions." The Scoping Document (Section 5.1) sets out that assumptions and analyses that support conclusions regarding Project effects will be described. With respect to conclusions about the impact of Project altered ice conditions on caribou, the EIS does not reconcile differing accounts using data or references when making conclusions about Project impact. Concerns about caribou falling through the ice and drowning due to altered ice conditions were raised by the FLCN (FLCN 2012, p. 78-79). The EIS concludes that caribou drowning is unlikely because "once the ice has formed...post-Project conditions include the formation of a stable ice cover on the reservoir..., including maintaining a steady reservoir level during freeze-up and monitoring ice thickness..., and less variation in water levels once the reservoir is established relative to current conditions" (TE-SV-7.0, Section 7.4.6.2.2, p. 7-121). The impact assessment would benefit from any support that can be provided by existing monitoring data from other GS's in the same watershed given the discrepancy between KCN observations and The Partnerships impact assessment. There are at least four other GS's on the Nelson River that should have data that could be used to inform this impact assessment. The EIS states that "There is no mitigation for dam failure" (TE-SV-7.0, Section 7.4.6.2.2, p. 7-122), but does not indicate the likelihood of dam failure and does not describe the potential impact on caribou. This should be explained so that affected groups can have a complete understanding of potential Project effects.	Describe any mitigation proposed to manage impacts of an altered ice regime (thin ice, air pockets under ice) on caribou mortality.	MMF-0007a	Can the Partnership please define what they would consider a "population-level effect" on the summer resident caribou herd estimated to be about 20-50 animals?	CEC Rd 2 MMF-0046a	MMF-0007a
						Can monitoring data from other projects be used to support this prediction, particularly given the discrepancy between KCN observations and The Partnerships impact assessment?	MMF-0007b	The Partnership does not have any technical monitoring data from existing GS's that could be used to evaluate the conclusion regarding altered ice conditions on caribou, as was requested in the original IR. Caribou drowning reports will be investigated and reported in the Partnership's Terrestrial Effects Monitoring plan. No further questions at this time.	CEC Rd 2 MMF-0046b	MMF-0007b
						Explain the likelihood of dam failure and the potential impact on caribou.	MMF-0007c	The Partnership refers to their response TAC Public Rd 2 CEAA-0009, which we assume was a typographical error and they intended to direct us to TAC Public Rd 1 CEAA-0009. This response only indicates that dam failure is "extremely unlikely" and does not discuss any impacts on caribou, as requested in the original IR. No further questions at this time.	CEC Rd 2 MMF-0046c	MMF-0007c
		7.4.6.2.2 Valued		Terrestrial	EIS Scoping Document Reference: 5.1 Project Effects: "Measures to mitigate potential effects that are technically and economically feasible will be identified. Potential effects that remain after the application of mitigation measures will be considered to be potential residual effects; The Scoping Document (Section 5.1) indicates that the EIS will describe the approach and methods used to identify and assess Project effects (Section 5.1). The EIS states that "This new section of PR 280 could increase local caribou hunting activity by domestic resource users" (TE-SV-7.0, Section 7.4.6.2.2, p. 7-121). The EIS concludes that harvest of LSA caribou populations is not expected to affect the broader regional harvest, and thus, the effect is expected to be	Describe how the effect of harvest on caribou populations differs between barren-ground and summer resident caribou.	MMF-0008a	Information request satisfied. The Partnership provided details on the effect of harvest on the different caribou populations.	CEC Rd 2 MMF-0047a	MMF-0008a

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MMF	TE SV	Environmental Components - Caribou	7-121	Terrestrial Environment	small. It is not clear if the predicted Project impact is similar for the different caribou herds in the Keeyask region. The Scoping Document (Section 5.1) sets out that measures to mitigate potential effects that are technically and economically feasible will be identified, but more specific details are required to understand how Project impacts might be managed. The EIS refers to Adverse Effects Agreements (AEA) offsetting programs that will result in alternate harvesting opportunities in the SLRMA to offset loss of TR due to the Project and to disperse harvest pressure in the LSA (TE-SV-7.0, Section 7.4.6.2.2, p.7-121). No details are provided of precisely how AEA offsetting programs will disperse existing harvest pressure. AEA offsetting programs mitigate impacts to First Nations Project partners by providing alternative harvesting opportunities. No reference was made to how other potential harvesters, such as Métis members, will be managed.	Provide the details of the components of the AEA offsetting program that function as mitigation for harvesting effects on caribou populations. Do these programs give consideration to Métis harvest in the region? How will residual adverse effects on Métis be offset?	MMF-0008b	The Partnership indicates in their response that "to date caribou have not been explicitly identified as a large game species harvested by Metis in any location in the Resource Use Regional Study Area." The Partnership goes on to say that a Metis-specific Traditional Land Use and Knowledge Study, socio-economic impact assessment and historical narrative for the Keeyask region will be undertaken. • Does the Partnership intend to revisit the impact assessment for caribou if the Manitoba Metis impact assessment indicates caribou hunting within the terrestrial Regional Study Area?	CEC Rd 2 MMF-0047b	MMF-0008b
MMF	N/A	Sections 7.4.2.1.4, 7.4.6.2.1, 7.4.6.2.2, 7.4.6.2.3 (TE SV); Section 6.5.8.1.1, 4.6.3, 6.5.8 (R to EIS); Section 3.3.2 (PD SV)	7-90, 7-117, 7-121 to 7-124, Map 7-27 (TE SV); 6-371, 4-34, 6-367 (R to EIS); 3-14 (PD SV)	Terrestrial Environment	EIS Scoping Document Reference: 5.1 Project Effects: "Measures to mitigate potential effects that are technically and economically feasible will be identified. Potential effects that remain after the application of mitigation measures will be considered to be potential residual effects;" The Scoping Document (Section 5.1) sets out that measures to mitigate potential effects that are technically and economically feasible will be identified, but more specific details are required to understand how Project impacts might be managed. The EIS indicates a "high confidence" (TE-SV-7.0, Section 7.4.6.2.3, p. 7-124) in the ability to mitigate and manage potential Project effects on caribou, yet the EIS provides little detail on proposed mitigation measures and does not appear to have provided the details of some plans intended to outline mitigation measures. It is difficult, if not impossible, to understand residual Project effects (and conclusions regarding the magnitude, extent, duration, and direction of residual effects) without a complete understanding of the proposed mitigation measures and the effectiveness of those measures. Details of how mitigation success will be measured, including targets or definitions of success, are not provided. The following proposed mitigation measures require more information in order to have a better understanding of how Project impacts might be managed: • "Use of the access roads by resource users will be addressed in the Construction Access Management Plan" (TE-SV-7.0, Section 7.4.6.2.1, p. 7-117). During operations, the EIS indicates that Project-related cutlines and trails will be blocked and portions re-vegetated (Section 7.4.6.2.2, p. 7-123). The Preliminary Construction Access Management Plan (http://keyask.com/wp/wp-content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-CD-version.pdf) indicates that Manitoba Infrastructure and Transportation (MIT) will assume responsibility for the north and south access roads (with permanent river crossing) once construction is completed. It is not clear if any further mitigation measures are proposed to manage increased access created by the upgraded and permanent north and south roads once construction is complete. • "Roadside ditches will be rehabilitated with native plants with low quality food value for caribou where practicable, to minimize attraction and the risk of collisions and harvest opportunities" (TE-SV-7.0, Section 7.4.6.2.1, p. 7-118), but no description or list of the native plant species to be used is provided. • First Nations indicated concerns about hindered access by wildlife due to debris accumulation on shorelines upon flooding. The EIS concluded a negligible to small effect on local caribou movement along shorelines due to implementation of the Forebay Clearing Plan and Waterways Management Plan (TE-SV-7.0, Section 7.4.6.2.2, p. 7-121). A Reservoir Clearing Plan for the Keeyask Project (http://www.hydro.mb.ca/projects/keeyask/pdf/Schedule_11_1_090529.pdf) and a Waterways Management Program for the Keeyask Project (http://www.hydro.mb.ca/projects/keeyask/pdf/Schedule_11_2_090529.pdf) were found on-line. No measures specific to caribou (or wildlife) movement were included within either report. • The majority of reservoir clearing will be occurring in winter when caribou herds converge on the site (TE-SV-7.0, Section 7.4.2.1.4, p. 7-90, Map 7-27). It is not clear what mitigation measures are proposed to specifically address this scenario for caribou. • Blasting restrictions will be put in place with respect to caribou calving season (Project Description SV, Section 3.3.2, p. 3-14), but it is not clear what mitigation is in place for blasting during other times caribou are present in the Keeyask region. • "A plan is being developed to coordinate caribou mitigation and monitoring activities among MH's northern developments, as well as with government authorities and existing caribou committees and management boards" (TE-SV-7.0, Section 7.4.6.2.2, p. 7-123). No timeframe was provided for when this plan could be available for review by affected parties.	Indicate if there will be any ongoing mitigation of increased access by resource users, created by the upgraded and permanent north and south roads, upon completion of construction. If so, please describe.	MMF-0009a	The Partnership indicates that no mitigation measures directed at effects of increased access by resource users are planned during operation and that this is within the mandate of MCWS. Based on the response, it is uncertain what mitigation measures might be in place, if any, for the north and south access roads during operations, whether or not mitigation success will be measured, who is responsible for measuring it, and how it will be measured (No definitions or targets for mitigation success have been provided). • Will the outcome of discussions between the Partnership and MCWS be made available to the MMF for comment? • Has the impact assessment for caribou taken into consideration that there may not be any mitigation measures directed at increased access by resource users during operations? • Please refer to follow-up questions under CEC Rd 1 MMF-0009g below [MMF-0048g].	CEC Rd 2 MMF-0048a	MMF-0009a
						Describe or list the native plant species to be used in roadside rehabilitation. Are these plant species a potential attractant for other species, such as moose?	MMF-0009b	Information request satisfied. A table listing plant species and their percentages in a recommended seed mix is provided.	CEC Rd 2 MMF-0048b	MMF-0009b
						Describe proposed mitigation measures to address impacts on local caribou movement due to debris accumulation on shorelines.	MMF-0009c	Will any debris accumulation along shorelines be managed by the Partnership after impoundment and during operation, if requested by affected groups?	CEC Rd 2 MMF-0048c	MMF-0009c
						Describe the mitigation measures established to minimize impacts when the presence of caribou in the Keeyask region coincides with proposed reservoir clearing.	MMF-0009d	Given that there is the potential for caribou to be present in the LSA during reservoir clearing, plans to minimize impacts to caribou should be in place. • Will clearing be delayed if caribou are present in the LSA or will other measures be used to displace caribou from the LSA?	CEC Rd 2 MMF-0048d	MMF-0009d
						Indicate if blasting will occur while caribou are present in the Keeyask region. If so, describe the mitigation measure established to minimize the impacts of blasting on caribou.	MMF-0009e	The Partnership responds that "blasting will be minimized to the maximum extent feasible from May 15 to June 30". • If caribou remain present beyond the undefined "maximum extent feasible", are any techniques planned to move caribou out of blasting zones? • Please provide a threshold that defines the "maximum extent feasible". • Please provide the assessment of residual impacts of blasting that still occurs during that time.	CEC Rd 2 MMF-0048e	MMF-0009e
						Indicate when the details of the plan for coordination of caribou mitigation and monitoring activities will be available to the Métis for review.	MMF-0009f	• Please see follow-up questions from CEC Rd 1 MMF-0009g below regarding the TEMP. • Will the Partnership provide the Terrestrial Mitigation Implementation Plan for review by the MMF once available?	CEC Rd 2 MMF-0048f	MMF-0009f
						Indicate how the success of mitigation will be gauged.	MMF-0009g	The Partnership indicates that a preliminary draft TEMP was filed on June 28, 2013 and that "the TEMP describes the monitoring of caribou during operation to evaluate performance of mitigation measures." As this plan has only recently been filed, we have some information requests specific to the plan: For the purposes of monitoring, pre-construction is defined "as the period between Project approval and the start of clearing activities for construction" (Preliminary TEMP, Section 1.3, p.1-6). • Please indicate if construction activity for the Keeyask Infrastructure Project (KIP) has already begun or will be ongoing in any of the Keeyask study areas during the collection of pre-construction information for the Keeyask Project. • Will monitoring activity in association with the north and south access roads continue during operations (i.e., once responsibility has been transferred to Manitoba Infrastructure and Transportation (MIT))? If so, who is responsible for continued monitoring?	CEC Rd 2 MMF-0048g	MMF-0009g
							MMF-0010a	Information request satisfied. The Partnership provided the Mammal Monitoring Investigations for the Wuskwatim Generation Project Pre-construction and Construction Report (2004-2009).	CEC Rd 2 MMF-0049a	MMF-0010a
							MMF-0010b	Neumann et al (2013) suggests that moose may only select for habitat near roads during times when traffic volumes are generally lower. Therefore, periods of heavy road traffic could result in loss of effective habitat for moose (i.e., by avoidance of roads). Spatio-temporal patterns in moose movement in relation to roads was also found by Eldergard et al (2012). Moose moved closer to roads at night and closer to smaller roads, both movements due to lower traffic volumes. Moose have also been noted to present a seasonal response to roads. Moose crossed roads less frequently in the summer (Beyer et al. 2013) and were found further from roads in the summer during periods of higher food availability (Eldergard et al. 2012). Therefore, moose exhibit behavioural adaptations to cope with roads and traffic and these adaptations can contribute to loss of effective habitat, particularly if high quality habitat is located near roads, as in the case of the Keeyask project. Monitoring programs will have to confirm impact predictions for moose during construction. No further questions at this time.	CEC Rd 2 MMF-0049b	MMF-0010b
		EIS Scoping Document Reference: 5.1 Project Effects: "Measures to mitigate potential effects that are technically and economically feasible will be identified. Potential effects that remain after the application of mitigation measures will be considered to be potential residual effects;" The Scoping Document (Section 5.1) sets out that measures to mitigate potential effects that are technically and economically feasible will be identified, but more specific details are required to understand how Project impacts might be managed. The EIS refers to AEA offsetting programs that will result in alternate harvesting opportunities in the SLRMA to offset loss of TR due to the Project and to disperse harvest pressure in the LSA (TE-SV-7.0, Section 7.4.6.2.2, p. 7-121). No details are provided of precisely how AEA offsetting programs will disperse existing harvest pressure. AEA offsetting programs mitigate impacts to First Nations Project partners by providing alternative harvesting opportunities. No reference was made to how other potential harvesters, such as Métis members, will be managed.			The original IR asked about mitigation for the potential increase in harvesting pressure on moose (due to increased access), not mitigation of impacts on First Nations harvesting opportunities. The Partnership refers to the Resource Use Section 1.2.4.2 of SE SV for an answer to the IR. This section largely discusses how impacts to domestic hunting will be mitigated. However, within this section it states that "AEA Offsetting Programs are expected to reduce hunting and gathering pressures in existing resource use areas and redistribute KCNs' domestic hunting and gathering activity over larger (regional) land bases" (p1-35). It appears that self-regulation of wildlife harvest by KCNs is a main component of the offsetting programs. • How will this self-regulation mitigation be monitored? The Partnership indicates in their response that, at this time, they are "not aware of any Metis-specific concerns regarding					

Department	Volume / Document	Line Number / Table Number / Figure Number	Page	Topic	Context / Preamble e.g., provide applicable background/rationale for providing the comment	Specific Department Comment / Request for Additional Information:	Round 1 Proponent Response	Round 2 Intervenor Question	Round 2 Response #	original intervenor IR#
MMF	TE SV	Abundance and Habitat, 7.4.6.3.2 Valued Environmental Components - Moose; Sections 6.5.8.2.1, 6.5.8.2.3 Mammals - Moose (R to EIS)	7-75, Table 7-26, 7-130 (TE SV); 6-379, 6-381	Terrestrial Environment	7.4.6.3.2, p. 7-130: No details are provided on precisely how AEA offsetting programs will disperse existing harvest pressure on moose. AEA offsetting programs mitigate impacts to First Nations Project partners by providing alternative harvesting opportunities. No reference was made to how other potential harvesters, such as Métis members, will be managed. The mean regional moose population is "extra low" according to aerial surveys conducted from 2002 to 2006 (mean 0.04 moose/km ² ; Table 7-26) and criteria provided in the EIS (Section 7.3.6.4.3, p. 7-75). The EIS concluded that moose harvest in the SLRMA will not likely exceed sustainable limits based on an estimate of current moose harvest (<10% of regional population) sourced from the Moose Harvest Sustainability Plan (MHSP). This information is used to support a prediction of negligible or small effect of moose harvest on the regional moose population. However, it does not appear that the Moose Harvest Sustainability Plan has been finalized or released for review. Understanding the details of the approach to moose management is critical for understanding if and how Project impacts are appropriately and successfully mitigated, particularly given the extra low regional moose population.	<ul style="list-style-type: none"> Provide the details of the components of the AEA offsetting program that function as mitigation for harvesting effects on moose. Do these programs give consideration to Métis harvest in the region? How will residual adverse effects on Métis be offset? Provide the Moose Harvest Sustainability Plan or indicate when it will be available for review by the Métis. 	MMF-0011	moose harvest in the Resource Use Regional Study Area or the Moose Regional Study Areas". The Partnership goes on to say that a Metis-specific Traditional Land Use and Knowledge Study, socio-economic impact assessment and historical narrative for the Keeyask region will be undertaken. <ul style="list-style-type: none"> Does the Partnership intend to revisit the impact assessment for moose if the Manitoba Metis impact assessment indicates moose harvest within the terrestrial Regional Study Area? Will the Metis have the opportunity to reconcile any desired mitigation measures with KCN-specific mitigation (e.g., self-regulation of wildlife harvest)? <p>The MHSP is currently undergoing an internal review and approval process.</p> <ul style="list-style-type: none"> Will the Partnership provide the final CNP Moose Harvest Sustainability Plan for review by the MMF once available? The MHSP is currently undergoing an internal review and approval process. Will the Partnership provide the final CNP Moose Harvest Sustainability Plan for review by the MMF once available? 	CEC Rd 2 MMF-0050	MMF-0011
MMF	TE SV	1.5.1, 7.4.6.3.1, 7.4.6.3.2, 7.4.6.3.3 (TE SV); 6.5.8, 6.5.8.2.1, 6.5.8.2.3 (R to EIS); 4.0 (PD SV)	-31, 7-127, 7-130, 7-131 (TE SV); 6-367, 6-379, 6-381, Map 4-10 (R to EIS); Map 2-22 (PD SV)	Terrestrial Environment	"EIS Scoping Document Reference: 5.1 Project Effects: "Measures to mitigate potential effects that are technically and economically feasible will be identified. Potential effects that remain after the application of mitigation measures will be considered to be potential residual effects;" The Scoping Document (Section 5.1) sets out that measures to mitigate potential effects that are technically and economically feasible will be identified, but more specific details are required to understand how Project impacts might be managed. The EIS indicates a "high confidence" (TE-SV-7.0, Section 7.4.6.3.3, p. 7-131) in the ability to mitigate and manage potential Project effects on moose, yet the EIS provides little detail on proposed mitigation measures and does not appear to have provided the details of some plans intended to outline mitigation measures. It is difficult, if not impossible, to understand residual Project effects (and conclusions regarding the magnitude, extent, duration, and direction of residual effects) without a complete understanding of the proposed mitigation measures and the effectiveness of those measures. Details of how mitigation success will be measured, including targets or definitions of success, are not provided. The following proposed mitigation measures require more information in order to have a better understanding of how Project impacts might be managed: <ul style="list-style-type: none"> "Use of the access roads by resources users will be addressed in the Construction Access Management Plan" (TE-SV-7.0, Section 7.4.6.3.1, p. 7-127). During operations, the EIS indicates that Project-related cutlines and trails will be blocked and portions re-vegetated (Section 7.4.6.3.2, p. 7-130). The Preliminary Construction Access Management Plan (http://keeyask.com/wp/wp-content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-CD-version.pdf) indicates that Manitoba Infrastructure and Transportation (MIT) will assume responsibility for the north and south access roads (with permanent river crossing) once construction is completed. It is not clear if any further mitigation measures are proposed to manage increased access created by the upgraded and permanent north and south roads once construction is complete. The EIS indicated that access to the north and south roads will be restricted to "designated resource harvesters only" (TE-SV-1.0, Section 1.5.1, p.1-31). There is no definition of or explanation of how one becomes a "designated resource harvester". It is not clear if this includes Métis members. The EIS makes reference to a Moose Harvest Sustainability Plan developed by TCN to guide the management of their Adverse Effects Agreement Access Program. This Plan apparently contains mitigation to ensure the sustainability of the moose population in the SLRMA. The MHSP appears to be a primary piece of mitigation for moose, yet we are not able to review the detailed information in this report and do not know when we will be able to review the report. "Roadside ditches will be rehabilitated with native plants with low quality food value for moose where practicable, to minimize attraction of moose to the road and the risk of wildlife-vehicle collisions and harvest opportunities" (TE-SV-7.0, Section 7.4.6.3.1, p. 7-127), but no description or list of the native plant species to be used is provided. "Continue to communicate and coordinate with TCN Members to verify that recommendations in the moose harvest sustainability plan are being implemented" (TE-SV-7.0, Section 7.4.6.3.2, p. 7-130). There is no indication that any plans are in place to communicate with Métis members regarding Project impacts on moose. The EIS indicates that mitigation for wetland function will benefit moose (TE-SV-7.0, Section 7.4.6.3.2, p. 7-130). Map 2-22 (Project Description SV) and Map 4-10 (R to EIS, Section 4.0) show Mitigation Areas and, more specifically, the location of Potential High Quality Wetlands. The route for the Proposed South Access Road runs directly through the Potential High Quality Wetland. It seems likely that this interaction would result in moose adjacent to the road which would increase mortality risk from collisions and/or hunting. It is not clear if this interaction was taken into consideration." 	<ul style="list-style-type: none"> Indicate if there will be any ongoing mitigation of increased access by resource users, created by the upgraded and permanent north and south roads, upon completion of construction. If so, please describe. 	MMF-0012a	The Partnership (in CEC Rd 1 MMF-0009a) indicates that no mitigation measures directed at effects of increased access by resource users are planned during operation and that this is within the mandate of MCWS. The Partnership intends to work with MCWS to monitor changes in moose licence demand and harvest locations. Based on the response, it is uncertain what mitigation measures might be in place for the north and south access roads during operations, if any, whether or not mitigation success will be measured, who is responsible for measuring it, and how it will be measured (no definitions or targets for mitigation success have been provided). <ul style="list-style-type: none"> Will the outcome of discussions between the Partnership and MCWS be made available to the MMF for comment? Please refer to follow-up questions under CEC Rd 1 MMF-0009g [seeCEC Rd2 MMF-0048g]. 	CEC Rd 2 MMF-0051a	MMF-0012a
						<ul style="list-style-type: none"> Define and explain how one becomes a "designated resource harvester". Does this designation include Métis members? 	MMF-0012b	Information request satisfied. The opportunity to request access to the north and south roads is available to the Metis.	CEC Rd 2 MMF-0051b	MMF-0012b
						Describe the mitigation measures or plans that are in place to address Métis-specific concerns regarding moose harvest (the Moose Harvest Sustainability Plan seems to be First Nation specific, although this would need to be confirmed once it is available for review).	MMF-0012c	Please see follow-up questions under CEC Rd 1 MMF-0011a [CEC Rd 2 MMF-0050].	CEC Rd 2 MMF-0051c	MMF-0012c
						Describe or list the native plant species to be used in roadside rehabilitation. Are these plant species a potential attractant for other species, such as caribou?	MMF-0012d	Information request satisfied. A table listing plant species and their percentages in a recommended seed mix is provided.	CEC Rd 2 MMF-0051d	MMF-0012d
						Are any plans proposed to communicate with the Métis community regarding moose harvest in Project area?	MMF-0012e	The Manitoba Metis will soon complete a Metis-specific Traditional Land Use and Knowledge Study, socio-economic impact assessment and historical narrative for the Keeyask region. <ul style="list-style-type: none"> Will the Metis have the opportunity to contribute to the development of the TEMP? Will the Metis be alerted to any activities relating to monitoring plan development, implementation, and reporting? 	CEC Rd 2 MMF-0051e	MMF-0012e
						Indicate if and explain how the interaction between proposed potential high quality wetlands and the south access road was factored into the impact assessment.	MMF-0012f	The partnership concludes that a minimum 100 m buffer on either side of the road will result in an unsubstantial increase in the risk of moose-vehicle collisions. Please provide any data or literature that would support this conclusion, particularly given that the wetland continues on either side of the road and may encourage crossings by moose.	CEC Rd 2 MMF-0051f	MMF-0012f
						Indicate how the success of mitigation will be gauged.	MMF-0012g	The Partnership indicates that a preliminary draft TEMP was filed on June 28, 2013 and that "the success of mitigation specific to moose will be gauged via the results of moose monitoring outlined in the TEMP". As this plan has only recently been filed, we have some information requests specific to the plan. <ul style="list-style-type: none"> Please see follow-up questions under CEC Rd 1 MMF-0009g [CEC Rd 2 MMF-0048g]. 	CEC Rd 2 MMF-0051g	MMF-0012g
MMF	R-EIS Guidelines	8.1.3 Adaptive Management	8-7	Response to EIS Guidelines	EIS Scoping Document Reference: 7.0 Environmental Monitoring, Management and Follow-up: "The monitoring programs will determine effects of the Project...To address relevant issues and concerns identified by KCN, other Aboriginal groups and other stakeholders; and to identify the role of KCN in implementing the plans." The EIS outlines numerous potential adaptive management measures for a range of VECs. However, there is no discussion of "action thresholds" or adaptive management triggers. Such triggers are necessary for understanding when to invoke the outlined adaptive management measures, or for modifying planned mitigation measures that are unsuccessful (CEAA 2009).	<ul style="list-style-type: none"> Provide adaptive management triggers for all VECs considered in CEA, especially for those where the assessment is most uncertain. Provide a table of adaptive management thresholds and triggers for VECs as a reference tool for use in follow-up and monitoring programs. Provide potential management actions that would be triggered if thresholds are surpassed. Provide a table of adaptive management thresholds and triggers for VECs as a reference tool for use in follow-up and monitoring programs. Provide potential management actions that would be triggered if thresholds are surpassed. 	MMF-0013	While we appreciate that flexibility is a key element of adaptive management in order to address uncertainty, so is the identification of Action Thresholds (CEAA, 2009), at least for those cases where sound baseline data exists to reduce uncertainty about impact assessments or the effectiveness of mitigation. No table of quantitative adaptive management thresholds and triggers for VECs that could be used as a reference tool for use in follow-up and monitoring programs was provided, as asked in the original IR. <ul style="list-style-type: none"> How does the Partnership intend to satisfy CEAA policy which requires that adaptive management thresholds are determined? Will the MMF have the opportunity to be involved in the development of adaptive management thresholds? 	CEC Rd 2 MMF-0052	MMF-0013
MMF	R-EIS Guidelines	8.2.3 Terrestrial Environment Monitoring	8-23, 8-24	Terrestrial Environment	EIS Scoping Document Reference: 7.0 Environmental Monitoring, Management and follow-up: "The EIS will describe a preliminary outline of an environmental protection program for monitoring and managing the effects of the Project on the biophysical and socio-economic environments arising from the construction, operation, and decommissioning of the Project". The EIS states that monitoring of caribou and moose VECs will occur "Regularly during construction and continuing for up to 30 years of operation, depending on results." (R to EIS, Section 8.2.3, Table 8-4, p. 8-23). Given the open ended lifespan of the Project, where hydroelectric generating stations can operate for a century or more, limiting the temporal scope of the monitoring program may cause important cumulative effects to be overlooked.	Provide an explanation for limiting the temporal scope of caribou and moose monitoring programs to 30 years post-construction given an expected lifespan of the Project of 100 years or more and the potential for cumulative effects resulting from the high level of development and disturbance already occurring and expected to increase in the region over the life of this Project.	MMF-0014	Information request satisfied. There is the opportunity for monitoring to be extended should monitoring show deviations from benchmarks or uncertainties related to these effects.	CEC Rd 2 MMF-0053	MMF-0014

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MMF	R-EIS Guidelines	8.0 Monitoring and Follow-up	8-26	Terrestrial Environment	EIS Scoping Document Reference: 7.0 Environmental Monitoring, Management and follow-up: "The EIS will describe a preliminary outline of an environmental protection program for monitoring and managing the effects of the Project on the biophysical and socio-economic environments arising from the construction, operation, and decommissioning of the Project". The EIS states that monitoring of predators will occur annually during construction, and then every 5 years, for only 30 years, during operations. Given the natural variability in population dynamics of potential prey species (e.g. caribou and moose), and the cumulative effects already impacting prey species, it would seem finer temporal scale data, over a longer period would be necessary to separate potential causal factors (e.g. density independent or dependent factors from anthropogenic factors) for prey species declines.	Provide an ecologically based explanation for limiting the temporal scope of gray wolf monitoring programs to every 5 years for only 30 years post-construction given the indeterminate lifespan of the Project.	MMF-0015	Information request satisfied. There is the opportunity for monitoring to be extended should monitoring show deviations from benchmarks or uncertainties related to these effects.	CEC Rd 2 MMF-0054	MMF-0015
MMF	TE SV	7.4.10 (TE SV); 5.3.2.1, 8.2.7 (R to EIS)	7-152 (TE SV); 5-7, 8-39 (R to EIS)	Terrestrial Environment	EIS Scoping Document Reference: 7.0 Environmental Monitoring, Management and Follow-up: "The monitoring programs will determine effects of the Project...To address relevant issues and concerns identified by KCN, other Aboriginal groups and other stakeholders; and To identify the role of KCN in implementing the plans." The Scoping Document (Section 7.0) sets out that monitoring programs will address relevant issues and concerns identified by KCN, other aboriginal groups and other stakeholders. Unfortunately, neither the Scoping Document nor the EIS describe how relevant issues and concerns will be identified nor how Métis members will be involved. The EIS states that "Monitoring is outlined for situations where the ATK and technical assessments differ, where a prediction has substantial uncertainty or a difference between predicted and actual residual effects could substantially alter the effects assessment." (TE-SV-7.0, Section 7.4.10, p. 7-152; R to EIS, Section 5.3.2.1, p. 5-7). It is not clear how it would be determined that there is a potential for "substantial" alteration to the effects assessment. The EIS contains extensive discussion of the role the Keeyask Cree Nations (KCNs) will play in the monitoring and follow-up programs for the Project, including participation in their development and implementation which "will facilitate capacity building by providing employment and training opportunities" (R to EIS, Section 8.2.7, p. 8-39) for their members. The EIS also discusses plans to facilitate communications with KCN communities through forums such as open houses to keep "community Members updated on Project activities, adverse effects, and proposed mitigation strategies." (R to EIS, Section 8.2.7, p. 8-39). No mention is made in the EIS if these same opportunities for participation and capacity building will be extended to Manitoba Métis Federation members."	Explain how it is determined that there could be a substantial alteration to the effects assessment such that monitoring would be implemented.	MMF-0016a	The Partnership did not explain how it is determined that there could be a "substantial" alteration to the effects assessment since they did not provide a list of quantitative adaptive management thresholds as was asked in the original IR CEC Rd 1 MMF-0013.	CEC Rd 2 MMF-0055a	MMF-0016a
						Will Manitoba Métis Federation members be invited to participate in the development and implementation of monitoring and follow-up programs related to the Project? If yes, explain to what extent the Métis will be involved. If no, explain why the Métis will not be involved.	MMF-0016b	The Partnership did not indicate if MMF members will be invited to participate in the development and implementation of monitoring and follow-up programs related to the Project, nor was the extent of potential Métis involvement described, as requested in the original IR. No further questions at this time.	CEC Rd 2 MMF-0055b	MMF-0016b
						Will monitoring results be communicated on a regular basis to Manitoba Métis Federation members? If so, what approach to communication (frequency, venue, in person or in person meetings) would be taken?	MMF-0016c	The Partnership did not indicate if monitoring results will be communicated on a regular basis to MMF members, nor was an approach to communication (frequency, venue, in person or in person meetings) with the MMF described, as requested in the original IR. No further questions at this time.	CEC Rd 2 MMF-0055c	MMF-0016c
MMF	R-EIS Guidelines	8.0 Monitoring and Follow-up	N/A	Response to EIS Guidelines	EIS Scoping Document Reference: 7.0 Environmental Monitoring, Management and follow-up: "The EIS will describe a preliminary outline of an environmental protection program for monitoring and managing the effects of the Project on the biophysical and socio-economic environments arising from the construction, operation, and decommissioning of the Project". The EIS provides a general outline of the terrestrial monitoring program, but contains no details on the sampling design for the monitoring and follow-up programs for terrestrial VECs including caribou and moose. The Preliminary Environmental Protection Program (EPP) document, released on April 26, 2013, states "The Partnership currently plans to file a preliminary draft of the Terrestrial Effects Monitoring Plan in the second quarter of 2013".	Is the draft terrestrial monitoring plan still scheduled to be released in the second quarter of 2013? If so, please provide a copy to the Métis for review.	MMF-0017	• Please see follow-up questions under CEC Rd 1 MMF-0009g.	CEC Rd 2 MMF-0056	MMF-0017
MMF	R-EIS Guidelines	Chapters 6 and 7	N/A	Terrestrial Environment	EIS Scoping Document Reference: 5.2 Cumulative Effects: "The cumulative effects assessment will focus on VECs (as described in section 3.3.1) the may be adversely affected by the Project and will consider likely adverse effects caused by the other projects or human activities that overlap in time and space with those of the Project". The EIS lacks a description of pre-disturbance baseline conditions for VECs such as caribou and moose that can be used to assess the cumulative effects of development. A general description is provided of caribou and moose conditions in the past and, based on the qualitative descriptions from KCN members, it sounds like past development has already had a significant cumulative impact on caribou and moose. Better technical data on historical conditions is required to understand change in VEC condition from pre-hydro development to the current day and into the future. A similar issue was noted as part of the review process for the Bipole III project: "The development of a baseline for evaluation of cumulative effects is more than a description of current conditions, which alone can discount the effects of past changes as simply the 'new normal'. Baseline development requires a retrospective analysis of how VEC conditions have changed over time and whether that change is significant in terms of the sustainability of the VEC." (Gunn and Noble, 2012)	Include a retrospective analysis of the historical or reference state of caribou and moose VECs in order to establish baseline conditions from which to assess change in VECs over time due to cumulative impacts of development in the region.	MMF-0018	Information request satisfied. The Partnership provided historical information for moose and caribou.	CEC Rd 2 MMF-0057	MMF-0018
MMF	R-EIS Guidelines	6.5.8.1.1 Mammals - Caribou; Chapter 7	6-137	Terrestrial Environment	EIS Scoping Document Reference: 5.2 Cumulative Effects: "The cumulative effects assessment will focus on VECs (as described in section 3.3.1) the may be adversely affected by the Project and will consider likely adverse effects caused by the other projects or human activities that overlap in time and space with those of the Project". The qualitative nature of the CEA makes comparing VEC conditions from the past, present and into the future very difficult and highly subjective. The CEA does not present clear thresholds for understanding the significance of cumulative effects currently, or into the future. The only threshold we observed was the 65% undisturbed habitat threshold to sustain a caribou population from Environment Canada (2012), and currently only 48% of the caribou range in Zone 5 is undisturbed (R to EIS, Section 6.5.8.1.1, p. 6-371), suggesting caribou are already experiencing significant cumulative impacts in the region. Quantitative thresholds are necessary for understanding the significance of past cumulative effects and the significance of future impacts on the VECs (Gunn and Noble 2012).		MMF-0019	See follow-up questions outlined in CEC Rd 1 MMF-0022 [see CEC Rd 2 MMF-0060] and CEC Rd 1 MMF-0006b [see CEC Rd MMF-0045b],	CEC Rd 2 MMF-0058a	MMF-0019a
								• Provide relevant, quantitative, threshold values for assessing the significance of cumulative effects on caribou and moose VECs. • Cumulative effects for caribou and moose are variously determined in Chapter 7 to be 'small', 'relatively small', or 'negligible'. Define the scales used to determine the magnitude and significance of cumulative effects acting on VECs.	See follow-up questions outlined in CEC Rd 1 MMF-0003c [CEC Rd 2 MMF-0042c] and CEC Rd 1 MMF-0006b [CEC Rd 2 MMF-0045b].	CEC Rd 2 MMF-0058b

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MMF	R-EIS Guidelines	7.5.2.2.3 Summary of Cumulative Effects on the Project with Past and Current Projects/Activities Mammals	7-29, 7-30	Terrestrial Environment	EIS Scoping Document Reference: 5.2 Cumulative Effects: "The cumulative effects assessment will focus on VECs (as described in section 3.3.1) the may be adversely affected by the Project and will consider likely adverse effects caused by the other projects or human activities that overlap in time and space with those of the Project". The EIS states that the "main Project effects on intactness are predicted to include a slight reduction in total linear feature density (positive effect) due to existing outlines being replaced by Project features" (Section 7.5.2.2.1, p.7-28). It is unclear how overlaying Project features on pre-existing outines equals a decrease in linear disturbance. At best should it not mean that no more linear disturbance will be created?	Clarify how overlaying Project features on pre-existing outlines will reduce the amount of linear disturbance leading to a positive effect on cumulative impacts.	MMF-0020	See follow-up questions outlined in CEC Rd 1 MMF-0003a and CEC Rd 1 MMF-0006b.	CEC Rd 2 MMF-0059	MMF-0020
MMF	R-EIS Guidelines	7.5.2.2.3 Summary of Cumulative Effects of the Project with Past and Current Projects/Activities Mammals	7-29, 7-30	Terrestrial Environment	EIS Scoping Document Reference: 5.2 Cumulative Effects: "The cumulative effects assessment will focus on VECs (as described in section 3.3.1) the may be adversely affected by the Project and will consider likely adverse effects caused by the other projects or human activities that overlap in time and space with those of the Project". The manner in which Project related effects are discussed in the CEA downplays the significance of the total cumulative effects caused by past and current developments and the addition of any Project specific impacts to that total. For example, the Project is expected to have small or negligible impacts on cumulative effects for caribou, yet based on habitat disturbance thresholds provided in the EIS (See MMF IR# 19) it would appear that there already are significant cumulative effects of development on caribou in the region. When discussing the cumulative effects of the Project with past and current projects/activities as this section does, it would seem like the effect of the Project should be added to the pre-existing cumulative effects to determine total cumulative effects and then assess their significance. Instead this section primarily discusses Project specific effects relative to cumulative effects from past and current projects/activities, downplaying the importance of the total cumulative effect on the VEC in question.	Discuss the significance of total cumulative effects on caribou and moose in the presence and absence of the Project. Does significance of the cumulative effect change by adding or removing the Project?	MMF-0021	See follow-up questions outlined in CEC Rd 1 MMF-0003a and CEC Rd 1 MMF-0006b.	CEC Rd 2 MMF-0060	MMF-0021
MMF	R-EIS Guidelines	7.5.2.2.3 Summary of Cumulative Effects of the Project with Past and Current Projects/Activities Mammals	7-35	Terrestrial Environment	EIS Scoping Document Reference: 5.2 Cumulative Effects: "The cumulative effects assessment will focus on VECs (as described in section 3.3.1) the may be adversely affected by the Project and will consider likely adverse effects caused by the other projects or human activities that overlap in time and space with those of the Project". Linear disturbances are well known to have complex and significant impacts on caribou distribution and movement (Dyer et al. 2001; Scurrah and Schindler 2012). The EIS states that while "the Keeyask Transmission Project could result in one or more transmission line rights-of-way south of Stephens Lake, it is not likely to limit caribou from passing through the area and calving on islands in the lake" (R to EIS, Section 7.5.2.3.3, p. 7-35), but provides no evidence to support this statement. The EIS assumes there will be no significant cumulative effect of future projects.	Provide supporting literature or data for the assumption that future increases in linear disturbance will not hinder movement or restrict the distribution of caribou in the region.	MMF-0022	Follow-Up Questions: The Partnership uses a 0.60 km/km2 (Salmo Consulting et al. 2003; Athabasca Landscape Team 2009) linear feature density benchmark below which the magnitude of the effects of linear feature density on caribou are classified as low. According to Salmo Consulting et al. (2003), this threshold is designed for a "Enhanced Resource Development and Agriculture/Settlement Area" Provincial Land Use Category. • What is the provincial land use category for the Keeyask study area? • Were seismic lines included in the calculation of linear feature density?	CEC Rd 2 MMF-0061	MMF-0022
MMF	R-EIS Guidelines	5.2, 6.6 (R to EIS); 1.0 (SE SV)	5-1, 5-6, 6-426 (R to EIS); 1-18 (SE SV)	Response to EIS Guidelines	"EIS Scoping Document Reference: 3.5 Spatial and Temporal Boundaries. Spatial boundaries (i.e. the study areas) will be established for the Project effects assessment. Study areas may vary between various environmental components, as appropriate. The EIS will explain the rationale used to determine the study area for various environmental components. 5.1 Project Effects. The EIS will identify the potential positive and adverse environmental effects of the Project. Measures to mitigate potential effects that are technically and economically feasible will be identified. Potential effects that remain after the application of mitigation will be considered to be potential residual effects. The EIS states that the extent to which the Project would have an effect on people "...depends largely on their proximity to and level of involvement in the Project" (R to EIS, Section 6.6, p. 6-426). The Socio-economic Local Study Area is defined as consisting of "...the four partner First Nation communities of TCN, WLFN, FLCN and YFFN, the Town of Gillam and the City of Thompson..." (R to EIS, Section 6.6, p. 6-426). The EIS goes on to state that the four KCNs are affected by the Project through the following pathways of effect: • Physical/biophysical effects on resource use/traditional use areas and heritage resources; • Employment and business effects; • Construction worker interaction within the partners' home communities; and • Investment income (Socio-economic SV, Section 1, p. 1-18). The Project was subject to two evaluations, "...the first of which was conducted by the Keeyask Cree Nations (KCNs) for their internal purposes and the second of which is a public review currently being conducted by federal and provincial environmental regulators" (R to EIS, Section 5.2, p. 5-1). As "in-vicinity" First Nations, the KCNs are described as having "...played an integral role, along with Manitoba Hydro, in directing and shaping the assessment" (R to EIS, Section 5.2, p. 5-6). There are Métis residing in the Local Study Area, including, the Town of Gillam and some of the KCNS. As well, there are Métis living in Regional Study Area, including, the City of Thompson. These Métis, as well as other Métis, use and rely on the land in the Local and Regional Study Areas. Despite this, the Métis have not been considered or assessed as a distinct group in the Local Study Area."	<ul style="list-style-type: none"> • What criteria were used to define the KCNs in the Local Study Area as "in-vicinity"? • What criteria were used to exclude the Métis from being defined as "in-vicinity", particularly those who reside in the Local Study Area? • Why were the Métis not identified as a distinct group in the Local Study Area? • Explain how the Métis in the Local Study Area will not be affected by the same pathways of effect as are identified for the KCNs. • Why were impacts of the Project on Métis in the Local Study Area not considered and assessed, as a distinct group, and to the same level of assessment, as First Nations in the Local Study Area? • Why was there no equivalent evaluation process provided to the Manitoba Métis Federation to evaluate the impacts of the project on the Métis residing in and using the Local Study Area, similar to the evaluation process that was provided to the First Nations in the Local Study Area? • Explain how impacts on the Métis, as a distinct group in the Local Study Area, have been adequately assessed, without consideration of the Métis as a distinct group in the Local Study Area, and without the provision of this same evaluation process to the Métis." 	MMF-0023	Follow-Up Questions: • In addition to understanding the nature of the Métis community in the Keeyask region, and any potential effects that may be experienced as a result of the Project, will the results of the Métis-specific Traditional Land Use and Knowledge Study (TLUKS), Socio-economic Impact Assessment and historical narrative for the Keeyask region be used to identify new mitigation measures and revise existing mitigation measures, where necessary, to address Project impacts on the Métis?	CEC Rd 2 MMF-0062	MMF-0023
						At what point during the Project environmental assessment were the AEA's negotiated with the KCNs?	MMF-0024a	Information request satisfied. The timing of negotiation of the Adverse Effects Agreements with the KCNs is explained.	CEC Rd 2 MMF-0063a	MMF-0024a
						How were "known and foreseeable adverse effects" accepted or validated by Manitoba Hydro or the KHLP?	MMF-0024b	<ul style="list-style-type: none"> • Will an Adverse Effect Agreement be negotiated with the MMF? • Will the MMF have the opportunity to validate it through a community ratification process or other means appropriate to the MMF? 	CEC Rd 2 MMF-0063b	MMF-0024b
						How were "known and foreseeable adverse effects" quantified by Manitoba Hydro or the KHLP for the AEA's?	MMF-0024c	<ul style="list-style-type: none"> • Will an Adverse Effect Agreement be negotiated with the MMF? • If yes, what process will be used to assess the foreseeable adverse effects of the project, and to reach a negotiated Adverse Effect Agreement with the MMF? • If yes, what range of factors will be considered in determining and negotiating the monetary value of the Adverse Effect Agreement (i.e. cost of implementing Offsetting Programs, population, and use of the Project area)? 	CEC Rd 2 MMF-0063c	MMF-0024c
						In addition to traditional knowledge and past experience, what information from the environmental and socioeconomic assessment (e.g. regarding potential impacts of the Project on the KCNs) informed the content of the AEA's?	MMF-0024d	Information request satisfied. The content of the AEA's is explained.	CEC Rd 2 MMF-0063d	MMF-0024d

Department	Volume / Document	Line Number / Table Number / Figure Number	Page	Topic	Context / Preamble e.g., provide applicable background/rationale for providing the comment	Specific Department Comment / Request for Additional Information:	Round 1 Proponent Response	Round 2 Intervenor Question	Round 2 Response #	original intervenor IR#
MMF	R-EIS Guidelines	4.3.3 Environmental Mitigation/Compensation; 6.6.2 Aboriginal Traditional Knowledge	4-15, 6-430		<p>effects that remain after the application of mitigation will be considered to be potential residual effects.</p> <p>Each of the KCNs negotiated an Adverse Effects Agreement (AEA) with Manitoba Hydro "...as a proactive approach...to address known and foreseeable adverse effects their traditional knowledge and past experience with hydro development was telling them would occur" (R to EIS, Section 6.6.2, p. 6-430). The AEAs include mitigation and offsetting programs that are intended to provide replacements and opportunities to offset unavoidable adverse effects of the Project (R to EIS, Section 4.3.3, p. 4-15).</p> <p>There are Métis residing in the Local Study Area, including, , the Town of Gillam and some of the KCNS. As well, there are Métis living in Regional Study Area, including, the City of Thompson. These Métis, as well as other Métis, use and rely on the land in the Local and Regional Study Areas. Despite this, the Métis have not been considered or assessed as a distinct group in the Local Study Area.</p>	What efforts were undertaken to gather and document Métis past experiences with hydro development and Metis traditional knowledge, with the same purpose of addressing "known and foreseeable adverse effects" on the Métis?	MMF-0024e	Efforts to gather and document Métis past experiences with hydro development and Métis traditional knowledge, with the purpose of addressing "known and foreseeable adverse effects" on the Métis are described as being provided through the Keeyask Public Involvement Program. According to the Partnership, the Métis have had the opportunity to learn about the project and express any concerns through the Public Involvement Program. No further questions at this time.	CEC Rd 2 MMF-0063e	MMF-0024e
						Describe any mitigation or offset programs that include or apply specifically to the Métis.	MMF-0024f	<ul style="list-style-type: none"> How many "mitigation programs" are there in all, and what are these programs? How many "mitigation programs" are restricted to specific groups? What are these programs? Which specific groups are they restricted to? 	CEC Rd 2 MMF-0063f	MMF-0024f
						Why was an AEA not negotiated with the Manitoba Métis Federation?	MMF-0024g	The Partnership states that an Adverse Effects Agreement was not negotiated with any Métis community or organization as they are not aware of any Métis community in the vicinity of the project or of any potential project impact specific to the Métis. This is based on the knowledge of the broader Study Area provided to them by the KCNs, as well as the Partnership's "years of study to document the existing socio-economic environment". No further questions at this time.	CEC Rd 2 MMF-0063g	MMF-0024g
						Explain how impacts on the Métis, as a distinct group in the Local Study Area, have been adequately mitigated, without consideration of the Métis as a distinct group in the Local Study Area, and without negotiation of an AEA with the Métis.	MMF-0024h	<ul style="list-style-type: none"> Will the results of the Métis-specific Traditional Land Use and Knowledge Study (TLUKS), Socio-economic Impact Assessment and historical narrative for the Keeyask region be used to identify potential impacts of the project to the Métis, as a distinct group of people within the study area? If yes, please explain how (i.e. by what process). If new/additional impacts are identified through the above studies, will the Partnership identify new mitigation measures, revise existing mitigation measures as necessary, and also negotiate an agreement regarding the mitigation of Project impacts on the Métis? 	CEC Rd 2 MMF-0063h	MMF-0024h
MMF	R-EIS Guidelines	8.0 Monitoring and Follow-up	8-1, 8-3, 8-6, 8-27 - 8-33	Response to EIS Guidelines	<p>EIS Scoping Document Reference:</p> <p>7.0 Environmental Monitoring, Management and Follow-up. The EIS will describe a preliminary outline of an environmental protection program for monitoring and managing the effects of the Project on the biophysical and socio-economic environments arising from the construction, operation, and decommissioning of the Project. ...The monitoring programs will determine effects of the Project, including: whether they are consistent with the analysis in the environmental impact assessment; whether they assess the effectiveness of remedial measures; and whether they allow for adaptive management and mitigation measures to be implemented if unforeseen impacts occur. The EIS states that an Environmental Protection Program will be developed to mitigate, manage and monitor potential environmental effects during the construction and operation phases of the Project. It will be comprised of three types of plans: protection plans, management plans, and monitoring plans (R to EIS, Chapter 8.0, p. 8-1). Environmental monitoring plans are designed "...to measure the actual effects of the Project, test predictions or identify unanticipated effects" (p. 8-6). A Socio-economic Monitoring Plan (SEMP) will be developed to monitor effects on components "...such as employment, business opportunities, traffic, and safety" (R to EIS, Chapter 8.0, p. 8-6). The EIS states that the SEMP will be developed by the Partnership, and it is expected that the KCNs will play a central role in its development and implementation (R to EIS, Chapter 8.0, p. 8-27).</p> <p>There are Métis residing in the Local Study Area, including, , the Town of Gillam and some of the KCNS. As well, there are Métis living in Regional Study Area, including, the City of Thompson. These Métis, as well as other Métis, use and rely on the land in the Local and Regional Study Areas. Despite this, the Métis have not been considered or assessed as a distinct group in the Local Study Area.</p>	<ul style="list-style-type: none"> Will the Métis, particularly those residing in and using the Local Study Area, be involved in the development and implementation of the SEMP? If yes, explain to what extent the Métis will be involved. If no, explain why the Métis will not be involved. 	MMF-0025a	<p>The Partnership does not wholly explain why the Métis will not be involved in the development and implementation of the SEMP, while the KCNs "...will play a central role...". The Partnership does provide access to the draft SEMP filed with the regulators on June 28, 2013.</p> <ul style="list-style-type: none"> If new/additional impacts are identified through the Métis-specific Traditional Land Use and Knowledge Study (TLUKS), Socio-economic Impact Assessment and historical narrative for the Keeyask region, will the Partnership revise the SEMP to include monitoring (and adaptive management) of such impacts? For example, in Section 4.2.1 of the draft SEMP, the Partnership states the "KCNs Members are the predominant users of the waterways upstream and downstream of the Project. Métis, other Aboriginal and non-Aboriginal people may also use the waterways in the vicinity of the Project..." (p.4-2). 	CEC Rd 2 MMF-0064a	MMF-0025a
						<ul style="list-style-type: none"> Where specific impacts on the Métis have not been identified, explain how the SEMP will "identify unanticipated effects" that are experienced by the Métis as a result of the Project. 	MMF-0025b	The Partnership states that monitoring of actual Project effects in the Local and Regional Study Areas will capture effects on the Métis. No further questions at this time.	CEC Rd 2 MMF-0064b	MMF-0025b
						<ul style="list-style-type: none"> Which of the "Supporting Topics or VECs" listed in Table 8-5 (p. 8-28) will have Métis-specific data gathered and documented as part of the monitoring activities? 	MMF-0025c	No further questions at this time.	CEC Rd 2 MMF-0064c	MMF-0025c
MMF	R-EIS Guidelines	3.4.1.3 Manitoba Metis Federation (R to EIS); Appendix 1A - Public Involvement Plan (PIP SV)	3-2, 3-3 (R to EIS); 1A-7 (PIP SV)	Public Involvement	<p>EIS Scoping Document Reference:</p> <p>3.3.1 – Public Involvement – Aboriginal People. The EIS will describe the consultation and involvement processes with the Keeyask Cree Nations (KCN), other First Nations, and Metis related to the environmental assessment. The Public Involvement Plan is described as applying to "Potentially affected Aboriginal people", but not to the four "in-vicinity" First Nations (the KCNs). It defines "Potentially affected Aboriginal people" as "Beyond the in-vicinity First Nations, other Aboriginal people (First Nation, Metis, and Inuit people) who may be affected by the Project..." (Public Involvement SV, Appendix 1A, p. 1A-7).</p> <p>There is therefore a distinction between Métis and First Nations who reside in the same communities in the Local Study Area, with the KCNs defined as "in-vicinity" to the project while the Métis are not.</p>	How would the Métis have been engaged differently by Manitoba Hydro if they were defined and considered as "in-vicinity", particularly those Métis residing in communities and using land in the Local Study Area?	MMF-0026	The Partnership does not wholly explain how the Métis would have been engaged differently had they been considered "in-vicinity", equivalent to the KCNs. The Partnership provides an overview of opportunities for the Métis to participate in the Public Involvement Program. No further questions at this time.	CEC Rd 2 MMF-0065	MMF-0026
MMF	R-EIS Guidelines	6.2.3.5.2 Economy	6-144	Socio-Economy	<p>EIS Scoping Document Reference:</p> <p>4.2.1 – Economy: "The EIS will describe... ..The regional economy, in particular local Aboriginal and non-Aboriginal communities and the regional centre, with an emphasis on the labour force, employment, unemployment, income, and education and training, and with a profile of local business capacity (e.g., goods and services)."</p> <p>5.1 – Project Effects: "Based on the description of the Project... ..and the existing environment... ..the EIS will identify the effects of the Project on the environment..."</p> <p>The EIS presents information on the levels of educational attainment for the KCNs Members, the Town of Gillam, and the City of Thompson in the Local Study Area. It also presents this information for northern Aboriginal residents, comparing it to educational levels in the Regional Study Area (R to EIS, Section 6.2.3.5.2, p. 6-144). It does not present information on the levels of educational attainment of the Métis population in the Local Study Area and Regional Study Area. This information would be useful for determining the potential Métis labour force, and would be necessary to measure changes in the levels of education for Métis in the Local and Regional Study Areas, particularly if these changes are to be attributed to the Project.</p>	<ul style="list-style-type: none"> Provide information on the current levels of educational attainment of the Métis population in the Local Study Area communities. Provide information on the levels of educational attainment of the Métis population in the Regional Study Area communities. 	MMF-0027a	<ul style="list-style-type: none"> Through completion of the studies (the Métis-specific Traditional Land Use and Knowledge Study (TLUKS), Socio-economic Impact Assessment and historical narrative for the Keeyask region) will Métis-specific baseline data be gathered and documented, including information regarding current levels of educational attainment for Métis in the Local Study Area? Will the results of the Métis-specific Traditional Land Use and Knowledge Study (TLUKS), Socio-economic Impact Assessment and historical narrative for the Keeyask region be used to identify potential adverse as well as positive impacts of the project to the Métis in the Local Study Area? If yes, please explain how (i.e. by what process). If new/additional impacts are identified through the above studies, will the Partnership identify new mitigation measures, revise existing mitigation measures as necessary, and also negotiate an agreement regarding the mitigation of Project impacts on the Métis? 	CEC Rd 2 MMF-0066a	MMF-0027a
						<ul style="list-style-type: none"> Provide information on the levels of educational attainment of the Métis population in the Regional Study Area communities. 	MMF-0027b	• See information requests under CEC Rd 1 MMF-0027a.	CEC Rd 2 MMF-0066b	MMF-0027b

Department	Volume / Document	Line Number / Table Number / Figure Number	Page	Topic	Context / Preamble e.g., provide applicable background/rationale for providing the comment	Specific Department Comment / Request for Additional Information:	Round 1 Proponent Response	Round 2 Intervenor Question	Round 2 Response #	original intervenor IR#
MMF	R-EIS Guidelines	6.2.3.5.2 Economy	6-145, 6-146	Socio-Economy	EIS Scoping Document Reference: 4.2.1 – Economy: “The EIS will describe... ..The regional economy, in particular local Aboriginal and non-Aboriginal communities and the regional centre, with an emphasis on the labour force, employment, unemployment, income, and education and training, and with a profile of local business capacity (e.g., goods and services).” 5.1 – Project Effects: “Based on the description of the Project... ..and the existing environment... ..the EIS will identify the effects of the Project on the environment...” The Proponent produced an inventory of skills pertinent to Project construction employment to complement the Statistics Canada information that was gathered. For the KCNs, “...this provides a more direct estimate of individuals who may be qualified for Project construction jobs” (R to EIS, Section 6.2.3.5.2, p. 6-145). The EIS (Table 6-12) presents estimates of the number of KCNs Members with relevant skills according to broad job categories required for Project construction, for the years 2014 (construction start) and 2021 (construction end) (R to EIS, Section 6.2.3.5.2, p. 6-146). The EIS does not provide the equivalent information for the Métis population in the Local Study Area and the Regional Study Area. This information would be useful for determining the potential Métis labour force, and would be necessary to measure changes in the skill levels and employability of Métis in the Local and Regional Study Areas, particularly if these changes are to be attributed to the Project.	• Provide information on the current (i.e. 2014, construction start) levels of skills by occupational category for the Métis population in the Local Study Area communities and Regional Study Area.	MMF-0028a	• Will the Métis-specific Traditional Land Use and Knowledge Study (TLUKS), Socio-economic Impact Assessment and historical narrative for the Keeyask region be used to gather and document Métis-specific baseline data, including information on the potential labour force, as well as current levels of skills by occupational category for the Métis population in the Local and Regional Study Areas? • Will the results of the Métis-specific Traditional Land Use and Knowledge Study (TLUKS), Socio-economic Impact Assessment and historical narrative for the Keeyask region be used to identify potential adverse as well as positive impacts of the project to the Métis in the Local and Regional Study Areas, including Métis participation in Project employment? If yes, please explain how (i.e. by what process). • If new/additional impacts are identified through the above studies, will the Partnership identify new mitigation measures and revise existing mitigation measures as necessary, including measures designed to enhance positive effects, such as those directed at increasing participation in Project employment? • Will Métis employment, including by occupational category, be monitored as part of the SEMP?	CEC Rd 2 MMF-0067a	MMF-0028a
						• Provide information on the estimated levels of skills by occupational category for the Métis population in the Local Study Area communities and Regional Study Area in 2021 (construction end).	MMF-0028b	• Please see Information Requests in CEC Rd 1 MMF-0028a.	CEC Rd 2 MMF-0067b	MMF-0028b
MMF	R-EIS Guidelines	6.2.3.5.2 Economy (R to EIS); 3.3.1.1 Pre-Project Training - Hydro Northern Training and Employment Initiative (SE SV)	6-140 (R to EIS); Table 3-2, p. 3-20 (SE SV)	Socio-Economy	EIS Scoping Document Reference: 4.2.1 – Economy: “The EIS will describe... ..The regional economy, in particular local Aboriginal and non-Aboriginal communities and the regional centre, with an emphasis on the labour force, employment, unemployment, income, and education and training, and with a profile of local business capacity (e.g., goods and services).” 5.1 – Project Effects: “Based on the description of the Project... ..and the existing environment... ..the EIS will identify the effects of the Project on the environment...” The EIS describes the Hydro Northern Training and Employment Initiative (HNTEI) as a pre-project training initiative, implemented to prepare Aboriginal northerners to participate in the construction employment and business opportunities available from northern hydroelectric development, including the Keeyask Projects (R to EIS, Section 6.2.3.5.2, p. 6-140). Ninety-one members of the MMF are reported to have completed courses or programs (2009, 2010) (Socio-economic SV, Table 3-2, p. 3-20).	• Provide information regarding the level of Métis enrollment in this initiative to compare to the numbers of course and program completions. • Provide information regarding the employment of Métis participants following completion of the courses and programs, as well as the number of Métis estimated to be employed on the Keeyask Project as a result of participation in this initiative.	MMF-0029a	Information request satisfied. The Partnership provides the level of Métis enrollment and participation in the HNTEI.	CEC Rd 2 MMF-0068a	MMF-0029a
						• Provide information regarding the employment of Métis participants following completion of the courses and programs, as well as the number of Métis estimated to be employed on the Keeyask Project as a result of participation in this initiative.	MMF-0029b	The Partnership provides information regarding the employment of Métis participants following completion of courses and programs as part of the HNTEI. The Partnership responds that estimates of Métis participation in Keeyask Project construction employment are included in the estimate of employment for Aboriginal residents in the Regional Study Area. Lastly, the Partnership refers to the Career Development Partnership Program between Manitoba Hydro and the MMF, which aims to have 100 Métis employed in permanent positions by 2014. There are currently 64 Métis permanently employed through this program. • How will Métis employment be monitored without Métis-specific estimates of participation in Keeyask Project construction employment? • What efforts could be undertaken by the Partnership to assist in achieving the goal of 100 Métis permanently employed by Manitoba Hydro by 2014?	CEC Rd 2 MMF-0068b	MMF-0029b
MMF	R-EIS Guidelines	6.2.3.5.2 Economy	6-141, 6-142	Socio-Economy	EIS Scoping Document Reference: 4.2.1 – Economy: “The EIS will describe... ..The regional economy, in particular local Aboriginal and non-Aboriginal communities and the regional centre, with an emphasis on the labour force, employment, unemployment, income, and education and training, and with a profile of local business capacity (e.g., goods and services).” 5.1 – Project Effects: “Based on the description of the Project... ..and the existing environment... ..the EIS will identify the effects of the Project on the environment...” The EIS presents information on the potential labour force in the KCNs communities, the Town of Gillam, the City of Thompson, and general labour force information for the Regional Study Area (R to EIS, Section 6.2.3.5.2, p. 6-142). It does not present information on the Métis potential labour force in the Local Study Area and Regional Study Area. To estimate the extent to which KCNs Members and the Regional Study Area Aboriginal workforce would participate in construction employment opportunities, a labour supply/demand model was developed (R to EIS, Section 6.6.3.1.1, p. 6-433). It does not include data on the potential labour force of the Métis, and nor does it provide information specific to the estimated levels of Métis participation in construction employment.	• Provide information on the potential labour force of the Métis in the Local Study Area communities, equivalent to the potential labour force information provided for the KCNs, Gillam, and Thompson.	MMF-0030a	• Will the Métis-specific Traditional Land Use and Knowledge Study (TLUKS), Socio-economic Impact Assessment and historical narrative for the Keeyask region be used to gather and document Métis-specific baseline data, including potential labour force data, for the Métis population in the Local Study Area? • Will the results of the Métis-specific Traditional Land Use and Knowledge Study (TLUKS), Socio-economic Impact Assessment and historical narrative for the Keeyask region be used to identify potential adverse as well as positive impacts of the project to the Métis in the Local Study Area, including participation of the Métis labour force in Project employment? • If new/additional impacts are identified through the above studies, will the Partnership identify new mitigation measures and revise existing mitigation measures, including measures designed to enhance positive effects, such as those directed at increasing participation of the Métis labour force located in the Local Study Area? • Will Métis labour force participation rates in Project employment be monitored as part of the SEMP?	CEC Rd 2 MMF-0069a	MMF-0030a
						• Provide information on the potential labour force of the Métis in the Regional Study Area.	MMF-0030b	• Will the Métis-specific Traditional Land Use and Knowledge Study (TLUKS), Socio-economic Impact Assessment and historical narrative for the Keeyask region be used to gather and document Métis-specific baseline data, including potential labour force data, for the Métis population in the Regional Study Area? • Will the results of the Métis-specific Traditional Land Use and Knowledge Study (TLUKS), Socio-economic Impact Assessment and historical narrative for the Keeyask region be used to identify potential adverse as well as positive impacts of the project to the Métis in the Regional Study Area, including participation of the Métis labour force in Project employment? • If new/additional impacts are identified through the above studies, will the Partnership identify new mitigation measures and revise existing mitigation measures, including measures designed to enhance positive effects, such as those directed at increasing participation of the Métis labour force located in the Regional Study Area? • Will Métis labour force participation rates in Project employment be monitored as part of the SEMP?	CEC Rd 2 MMF-0069b	MMF-0030b
MMF	R-EIS Guidelines	6.6.3 Economy (R to EIS); 3.0 Economy (SE SV)	6-434, 6-435 (R to EIS); 3-98, 3-125 (SE SV)	Socio-Economy	EIS Scoping Document Reference: 4.2.1 – Economy: “The EIS will describe... ..The regional economy, in particular local Aboriginal and non-Aboriginal communities and the regional centre, with an emphasis on the labour force, employment, unemployment, income, and education and training, and with a profile of local business capacity (e.g., goods and services).” 5.1 – Project Effects: “Based on the description of the Project... ..and the existing environment... ..the EIS will identify the effects of the Project on the environment...” The EIS states that the Project is expected to generate “...an estimated 235 to 600 person years of construction employment for KCNs Members, which equates to 6-14% of the total construction workforce” (R to EIS, Section 6.6.3, p. 6-434). During construction, the JKDA includes an employment target of 630 person-years of employment for the KCNs. The target includes their participation in construction of the Keeyask Generation Project as well as their participation in employment opportunities associated with the Keeyask Infrastructure Project (R to EIS, Section 6.2.3.5.2, p. 6-435; Socio-economic SV, Section 3, p. 3-98). With regard to “Aboriginal workers from the Regional Study Area” the EIS states that the Project “is expected to provide substantial construction employment... ..ranging from an estimated 550 to 1,700 person years. At these levels, between 13% and 40% of total construction	• Provide information on the estimated (or anticipated) levels of employment for the Métis as follows: o What is the estimated level of construction employment for Métis in the Local Study Area? o What is the estimated level of construction employment for Métis in the Regional Study Area? o What is the estimated level of operations employment for Métis in the Local Study Area? o What is the estimated level of operations employment for Métis in the Regional Study Area?	MMF-0031a	The Partnership provides information regarding estimated construction and operations employment for the Local and Regional Study Areas, and states that the Métis are included in the estimates provided. • Will the Métis-specific Traditional Land Use and Knowledge Study (TLUKS), Socio-economic Impact Assessment and historical narrative for the Keeyask region be used to gather and document Métis-specific baseline data, including potential labour force data, for the Métis population in the Local Study Area? • Will the results of the Métis-specific Traditional Land Use and Knowledge Study (TLUKS), Socio-economic Impact Assessment and historical narrative for the Keeyask region be used to identify estimated levels of construction and operations employment for the Métis, for both the Local and Regional Study Areas? • If new/additional impacts are identified through the above studies, will the Partnership identify new mitigation measures and revise existing mitigation measures, including measures designed to enhance positive effects, such as those directed at increasing participation of the Métis labour force? • Will rates of participation in Project employment by the Métis be monitored as part of the SEMP?	CEC Rd 2 MMF-0070a	MMF-0031a

Department	Volume / Document	Line Number / Table Number / Figure Number	Page	Topic	Context / Preamble e.g., provide applicable background/rationale for providing the comment	Specific Department Comment / Request for Additional Information:	Round 1 Proponent Response	Round 2 Intervenor Question	Round 2 Response #	original intervenor IR#
					employment would be filled by Aboriginal workers from the Regional Study Area" (R to EIS, Section 6.6.3, p. 6-435). Commitments in the JKDA also include 20-year targets for employment of KCNs Members during operations with Manitoba Hydro, across Manitoba Hydro's entire system, not just for the Keeyask Generation Project. The target level of employment for all four KCNs is 182 jobs, with 100 jobs for TCN Members, 10 for WLFN Members, 36 for YFFN Members, and 36 for FLCN Members by 2029 (Socio-economic SV, Section 3, p. 3-125). The EIS distinguishes between the KCNs, Gillam, and Thompson in the Local Study Area, and Aboriginal workers from the Regional Study Area (which includes the KCNs). In doing so, it does not include specific information on estimated levels of employment of Métis in the Local Study Area and the Regional Study Area during construction and operations.	• Why are no targets established for Métis participation in construction and operations employment?	MMF-0031b	The Partnership differentiates between the JKDA (which sets employment targets for the KCNs) and the EIS (which does not set employment targets) to explain why no targets are established for Métis participation in construction and operations employment, and also refers to the Career Development Partnership Program (see CEC Rd 1 MMF-0029). No further questions at this time.	CEC Rd 2 MMF-0070b	MMF-0031b
MMF	R-EIS Guidelines	6.6.4.1.1 Population	6-450	Socio-Economy	EIS Scoping Document Reference: 4.2.1 – Economy: "The EIS will describe... The regional economy, in particular local Aboriginal and non-Aboriginal communities and the regional centre, with an emphasis on the labour force, employment, unemployment, income, and education and training, and with a profile of local business capacity (e.g., goods and services)." 5.1 – Project Effects: "Based on the description of the Project... and the existing environment... the EIS will identify the effects of the Project on the environment..." The EIS states that KCNs Members would qualify for Project hiring preferences "...regardless of their home address within the province of Manitoba..." (R to EIS, Section 6.6.4.1.1, p. 6-450) and as such, would not need to move to communities in the Local Study Area. This measure is intended to address potential in-migration to, and crowding in, the Local Study Area communities; however, it has implications for the Métis in terms of hiring preferences.	• Confirm whether KCN Members residing outside of the Local Study Area will be given employment preference to equally qualified Métis residing within the Local Study Area.	MMF-0032a	The Partnership states that, for open-tendered contracts, KCN members residing in Manitoba and Métis residing in the Regional Study Area fall within the same first hiring preference, and will be selected on the basis of their qualifications. • Will a Direct Negotiation Contract (DNC) be signed between Manitoba Hydro/the Partnership and MMF, entitling MMF to give first preference to its own members?	CEC Rd 2 MMF-0071a	MMF-0032a
					• If employment preference is given to KCN Members, provide a rationale for this provision.	MMF-0032b	No further questions at this time.	CEC Rd 2 MMF-0071b	MMF-0032b	
MMF	R-EIS Guidelines	6.2.3.5.2 Economy, 6.6.3.2 Business Opportunities	6-146, 6-438 - 6-442	Socio-Economy	EIS Scoping Document Reference: 4.2.1 – Economy: "The EIS will describe... The regional economy, in particular local Aboriginal and non-Aboriginal communities and the regional centre, with an emphasis on the labour force, employment, unemployment, income, and education and training, and with a profile of local business capacity (e.g., goods and services)." 5.1 – Project Effects: "Based on the description of the Project... and the existing environment... the EIS will identify the effects of the Project on the environment..." The EIS presents information about the capacity of existing businesses to participate in opportunities that may arise from the Project, and states that "KCNs businesses are of particular interest given the direct negotiated contracts (DNCs) that will be made available to them as a result of the JKDA" (R to EIS, Section 6.2.3.5.2, p. 6-146). It provides a description of the range of KCNs Members' businesses with the potential for participating in Keeyask-related contracts, and then describes the capacity of Gillam and Thompson to supply needed services to the Project (R to EIS, Section 6.2.3.5.2, p.6-146). The EIS concludes that "...the majority of business opportunities in the Local Study Area are expected to flow to the KCNs through DNCs" (R to EIS, Section 6.6.3.2, p. 6-439) and further, that "Business effects in the Regional Study Area are expected to be minimal in comparison to communities in the Local Study Area." (R to EIS, Section 6.6.3.2, p. 6-438). It is not apparent whether any efforts were undertaken to determine the presence and capacity of Métis-owned businesses in the Local Study Area communities (i.e. including in Gillam and in Thompson) and the Regional Study Area. The extent to which Métis-owned businesses can be anticipated to participate in opportunities that may arise from the Project is also not known.	• Describe the efforts that were undertaken to determine the presence and capacity of Métis-owned businesses in the Local Study Area communities and the Regional Study Area that could participate in opportunities to supply services to the Project.	MMF-0033a	The Partnership distinguishes between opportunities available through Direct Negotiation Contracts (DNC) and an open tender process, and states that Métis vendors would be open to tendering on such work. • Will a Direct Negotiation Contract (DNC) be signed between Manitoba Hydro/the Partnership and MMF? • Will the Métis-specific Traditional Land Use and Knowledge Study (TLUKS), Socio-economic Impact Assessment and historical narrative for the Keeyask region be used to gather and document Métis-specific baseline data, including information on potential and existing Métis-owned businesses?	CEC Rd 2 MMF-0072a	MMF-0033a
					• Provide information on the number of Métis-owned businesses in the Local Study Area communities and the Regional Study Area that provide services needed by the project, regardless of whether these can be met by existing KCNs Members' businesses.	MMF-0033b	No further questions at this time.	CEC Rd 2 MMF-0072b	MMF-0033b	
					• Provide an estimate of the extent to which the above-identified Métis-owned businesses can expect to participate in opportunities that may arise from the Project.	MMF-0033c	No further questions at this time.	CEC Rd 2 MMF-0072c	MMF-0033c	
MMF	R-EIS Guidelines	6.2.3.5.3 Population, Infrastructure and Services, 6.6.4.1 Population (R to EIS); 4.0 Population, Infrastructure and Services (SE SV)	6-148 - 6-151, 6-449 - 6-451 (R to EIS); 4-34, 4-97 (SE SV)	Socio-Economy	EIS Scoping Document Reference: 4.2.2 – Population, Infrastructure, and Services: "The EIS will describe the following attributes in the relevant study area(s): Existing population distribution and demographics, ..." 5.1 – Project Effects: "Based on the description of the Project... and the existing environment... the EIS will identify the effects of the Project on the environment..." As stated in the EIS, "Population is a supporting topic that leads to an understanding of changes to housing, infrastructure and services" (R to EIS, Section 6.6.4.1, p. 6-449). Using Statistics Canada 2006 Census data, the EIS provides the populations of (1) the KCNs combined, including both on- and off-reserve Members, (2) Gillam, and (3) Thompson. The EIS then provides population projections to understand population growth both with and without the project. The analysis focuses on the Local Study Area; the Project is not expected to result in population changes in the Regional Study Area (R to EIS, Section 6.2.3.5.3, p.6-149, p. 6-150; R to EIS, Section 6.6.4.1, p. 6-449, p. 6-450). Forty-five percent of the population of Gillam self-identified as Aboriginal in the 2006 Census (Socio-economic SV, Section 4, p. 4-34), while 72% of the population of the Regional Study Area is identified as Aboriginal (Socio-economic SV, Section 4, p. 4-97). The EIS, however, does not present information regarding the Métis population in the Local Study Area communities, or the distribution of the Métis population in the Local and Regional Study Areas. This information would enable a better understanding of how the Métis residing in communities in the Local Study Area might experience impacts as a result of changes in population. This understanding is particularly critical, as the Métis are not specifically included in the mitigation and offsetting programs conducted as part of the Adverse Effect Agreements (AEAs) negotiated between the KCNs and Manitoba Hydro.	• Provide estimates of the Métis population in the Local Study Area, including, specific communities.	MMF-0034a	• If the results of the Métis-specific Traditional Land Use and Knowledge Study (TLUKS), Socio-economic Impact Assessment and historical narrative for the Keeyask region present more detailed information regarding the Métis population figures in the Local Study Area, will this information be used to reassess potential impacts on the Métis in the Local Study Area and to identify new mitigation measures or revise existing mitigation measures to address such impacts?	CEC Rd 2 MMF-0073a	MMF-0034a
					• Provide estimates of the Métis population in the Regional Study Area, including, specific communities.	MMF-0034b	• If the results of the Métis-specific Traditional Land Use and Knowledge Study (TLUKS), Socio-economic Impact Assessment and historical narrative for the Keeyask region present more detailed information regarding the Métis population figures in the Regional Study Area, will this information be used to reassess potential impacts on the Métis in the Regional Study Area and to identify new mitigation measures or revise existing mitigation measures to address such impacts?	CEC Rd 2 MMF-0073b	MMF-0034b	
MMF	R-EIS Guidelines	6.2.3.5.3 Population, Infrastructure and Services, 6.6.4.2 Housing	6-152, 6-153, 6-453 - 6-455	Socio-Economy	EIS Scoping Document Reference: 4.2.2 – Population, Infrastructure, and Services: "The EIS will describe the following attributes in the relevant study area(s): Existing infrastructure and services of Aboriginal and other in-vicinity communities, including... ...housing/accommodation supply..." 5.1 – Project Effects: "Based on the description of the Project... and the existing environment... the EIS will identify the effects of the Project on the environment..." The EIS describes the current availability of housing in the KCNs communities, Gillam, and Thompson (R to EIS, Section 6.2.3.5.3, p. 6-152), and predicts the residual effects of Project construction on housing in the KCNs communities, Gillam and Thompson to be adverse, in terms of the demand that will be created for housing, particularly temporary	• Predict how the Métis population in the Local Study Area communities, particularly Gillam, might be anticipated to experience adverse effects on the availability of housing during construction.	MMF-0035a	• If the results of the Métis-specific Traditional Land Use and Knowledge Study, Socio-economic Impact Assessment and historical narratives on Métis use and occupancy in northern Manitoba and in the Keeyask region demonstrate a potential impact to the availability and cost of housing for the Metis in the Local and Regional Study Areas as a result of the project, will the Partnership reassess the potential impacts and identify mitigation measures to address potential effects on housing as these might be experienced by the Metis?	CEC Rd 2 MMF-0074a	MMF-0035a

Department	Volume / Document	Line Number / Table Number / Figure Number	Page	Topic	Context / Preamble e.g., provide applicable background/rationale for providing the comment	Specific Department Comment / Request for Additional Information:	Round 1 Proponent Response	Round 2 Intervenor Question	Round 2 Response #	original intervenor IR#
					housing, during construction, and in the context of current levels of housing availability (R to EIS, Section 6.6.4.2, p. 6-453). It is necessary to understand how adverse impacts on housing during construction might be experienced by the Métis populations residing in Local Study Area communities. (To understand the magnitude of this impact, it is necessary to understand the size of the Métis populations in the Local Study Area communities. A previous IR requested that the Proponent provide an estimate of the Métis populations in the Local Study Area communities).	• Identify measures that could be implemented, and identify the party or parties responsible for their implementation, to lessen the predicted adverse effects to housing as specifically experienced by the Métis.	MMF-0035b	No further questions at this time.	CEC Rd 2 MMF-0074b	MMF-0035b
MMF	R-EIS Guidelines	6.2.3.5.3 Population, Infrastructure and Services, 6.6.4.3 Infrastructure and Services	6-153 to 6-156, 6-455 to 6-459	Socio-Economy	EIS Scoping Document Reference: 4.2.2 – Population, Infrastructure, and Services: “The EIS will describe the following attributes in the relevant study area(s): Existing infrastructure and services of Aboriginal and other in-vicinity communities...” 5.1 – Project Effects: “Based on the description of the Project... and the existing environment... the EIS will identify the effects of the Project on the environment...” The EIS describes existing infrastructure and service delivery in the KCNs, Gillam and Thompson (R to EIS, Section 6.2.3.5.3, p. 6-153 to 6-156), and predicts residual effects of Project construction on the infrastructure and services of the Local Study Area communities to be adverse (R to EIS, Section 6.6.4.3, p. 6-458). To address adverse effects, mitigation measures are provided for Local Study Area communities (R to EIS, Section 6.6.4.3, p. 6-458). As well, new infrastructure and services are included in the AEA’s negotiated between each of the KCNs and Manitoba Hydro (R to EIS, Section 6.6.4.3, Table 6-45, p.6-457). It is necessary to understand how adverse impacts on infrastructure and services during construction might be experienced by the Métis populations residing in Local Study Area communities. (To understand the magnitude of this impact, it is necessary to understand the size of the Métis populations in the Local Study Area communities. A previous IR requested that the Proponent provide an estimate of the Métis populations in the Local Study Area communities). This understanding is particularly critical, as Manitoba Hydro has not negotiated an AEA with the Métis in the Local Study Area, and as such, several of the new infrastructure and services that will be available to the KCNs will not be available to the Métis in the Local Study Area communities.	• Predict how the Métis population in the Local Study Area communities, particularly Gillam, might be anticipated to experience adverse effects on infrastructure and services during construction. • Identify measures that could be implemented, and identify the party or parties responsible for their implementation, to lessen the predicted adverse effects to infrastructure and services as specifically experienced by the Métis.	MMF-0036	• If the results of the Métis-specific Traditional Land Use and Knowledge Study, Socio-economic Impact Assessment and historical narratives on Métis use and occupancy in northern Manitoba and in the Keeyask region demonstrate previously unidentified potential impacts on infrastructure and services in the Local and Regional Study Areas as a result of the project, will the Partnership reassess the potential impacts and identify mitigation measures to address potential effects as these might be experienced by the Métis?	CEC Rd 2 MMF-0075a	MMF-0036
								No further questions at this time.	CEC Rd 2 MMF-0075b	
MMF	R-EIS Guidelines	6.6.5.1 – Governance, Goals and Plans, 6.6.5.2 – Community Health, 6.6.5.3 – Mercury and Human Health, 6.6.5.6 – Culture and Spirituality	6-465 to 6-468, 6-468 to 6-473, 6-473 to 6-478, 6-490 to 6-497	Socio-Economy	EIS Scoping Document Reference: 4.2.3 – Personal, Family and Community Life: The EIS will describe the following attributes in the relevant study area(s): public safety; travel, access and safety; aesthetics; health status and health issues; culture and spirituality; governance, goals and plans. Some of the VECs used to assess the effects of the Project on personal, family and community life in the Local Study Area include (1) Governance, Goals and Plans, (2) Community Health, and (3) Mercury and Human Health. The assessment results for each of these VECs are described below. “Overall, the expected and likely Project residual effects on the KCNs governance, goals and plans are expected to be positive due to existing provisions of the JKDA and AEA’s and ongoing involvement in Project committees and the Board. Residual effects on Gillam and Thompson governance, goals and plans are expected to be neutral (due to the planning processes already in hand)” (R to EIS, Section 6.6.5.1, p. 6-468). Governance, Goals and Plans In the discussion for this VEC, a description of Métis governance, goals and plans, and how the Project could be expected to impact these, is not included. Furthermore, and as evident in the above text, the Proponent is relying on the JKDA and the AEA’s to mitigate impacts to the KCNs. This has implications for the Métis, with whom Manitoba Hydro has not negotiated an AEA. “Overall, residual Project effects on community health are expected to be adverse for the construction phase due to the potential for increased alcohol and drug use, adverse worker interactions and worry about impending changes to the environment; and positive for the operation phase due to the implementation of AEA programs and the commitment to ongoing communication and planning” (R to EIS, Section 6.6.5.2, p. 6-473). Community Health In the discussion for this VEC, there is no description of Project effects on the community health of the Métis population in the Local Study Area communities. Furthermore, and as evident in the above text, the Proponent is relying on the JKDA and the AEA’s to mitigate impacts to the KCNs. This has implications for the Métis, with whom Manitoba Hydro has not negotiated an AEA. Mercury and Human Health As part of the assessment, a human health risk assessment was conducted. “The human health risk assessment evaluated the potential exposure to methylmercury for the KCNs, as these are the communities at greatest risk due to their use of country foods. Although the human health risk assessment focused on the KCNs, the baseline conditions and results of the risk assessment are also generally applicable to non-First Nation individuals who use Stephens Lake and/or Gull Lake for resource harvesting in a similar capacity” (R to EIS, Section 6.6.5.3, p.6-474). The EIS predicted residual Project effects on mercury and human health to be adverse during the operation phase, “due to the elevated levels of methylmercury in country foods” (R to EIS, Section 6.6.5.3, p. 6-478). To mitigate adverse effects, the Proponent has referred to the AEA’s. “Reduced use of country foods may have its own health effects. To address this concern, fish replacement programs have been included in each of the KCNs AEA’s as a key measure to encourage continued use of country food from areas unaffected by the Project” (R to EIS, Section 6.6.5.3, p. 6-477). In the discussion for this VEC, and apparent in the above text, the Proponent is relying on the JKDA and the AEA’s to mitigate impacts to the KCNs. This has implications for the Métis, with whom Manitoba Hydro has not negotiated an AEA. Culture and Spirituality The discussion of this VEC is restricted to the KCNs; there is no apparent consideration of the impacts of the Project on Métis culture and spirituality. Overall, the residual Project effects on culture and spirituality are expected to be adverse (R to EIS, Section 6.6.5.6, p.6-496). To address these adverse effects, the Proponent refers to the AEA’s negotiated between Manitoba Hydro and the KCNs. “Within each agreement, a set of cultural and AEA offsetting programs were developed which deal directly with the potential adverse effects of the Project on culture and spirituality” (R to EIS, Section 6.6.5.6, p. 6-491).	For each of the VECs described above, explain how adverse impacts on the Métis population residing in the Local Study Area communities will be identified and managed, particularly in the absence of an AEA between Manitoba Hydro and the Métis, and given the lack of mitigation and offset programs included in the AEA’s between Manitoba Hydro and the KCNs.	MMF-0037	• If the results of the Métis-specific Traditional Land Use and Knowledge Study, Socio-economic Impact Assessment and historical narratives on Métis use and occupancy in northern Manitoba and in the Keeyask region demonstrate previously unidentified potential impacts, as these might be experienced by the Métis, on the above VECs in the Local and Regional Study Areas as a result of the project, will the Partnership reassess the potential impacts and identify mitigation measures to address potential effects as these might be experienced by the Métis?	CEC Rd 2 MMF-0076	MMF-0037

Department	Volume / Document	Line Number / Table Number / Figure Number	Page	Topic	Context / Preamble e.g., provide applicable background/rationale for providing the comment	Specific Department Comment / Request for Additional Information:	Round 1 Proponent Response	Round 2 Intervenor Question	Round 2 Response #	original intervenor IR#
MMF	R-EIS Guidelines	6.6.3.5 Resource Economy	6-446 to 6-449	Socio-Economy	<p>"The EIS evaluates the effects of the Project on the "cash and in-kind income and livelihood" of resource users in the KCNs communities, and concludes that these are expected to be neutral during construction and operations as a result of mitigation. "Losses of in-kind income from reduced domestic resource use in the vicinity of the Project are expected to be mitigated by the AEA offsetting programs that provide access to resource harvesting at alternative and unaffected locations as well as to healthy fish for consumption in communities" (R to EIS, Section 6.6.3.5.1, p.6-447). There are Métis residing in the Local and Regional Study Areas. These Métis, as well as other Métis, use and rely on the land in the Local and Regional Study Areas. Despite this, the EIS does not include an assessment of the impacts of the Project on the resource economy (i.e. the cash and in-kind income and livelihood) of the Métis. It states that the Proponent has been working with the MMF to undertake studies "...identifying any effects of the Project related to resource use of the area by their members..." but that "...there is no evidence to date of effects on members of the Manitoba Métis Federation... ..at the time this report was submitted" (R to EIS, Section 6.6.3.5, p.6-446). The Métis anticipate adverse effects as a result of the Project on their cash and in-kind income and livelihood. Furthermore, and as evident in the preceding text, the Proponent is relying on the AEAs to mitigate impacts to the KCNs. This has implications for the Métis, with whom Manitoba Hydro has not negotiated an AEA. As such, no mitigation is in place to address the adverse economic effects anticipated by the Métis as a result of changes in their resource use."</p>	<p>In the absence of studies identifying the effects of the Project on resource use by the Métis, on what information did the Proponent base their conclusion that "...there is no evidence to date of effects on members of the Manitoba Métis Federation...?"</p>	MMF-0039a	<ul style="list-style-type: none"> • If the results of the Métis-specific Traditional Land Use and Knowledge Study, Socio-economic Impact Assessment and two historical narratives demonstrate previously unidentified potential impacts on the resource economy, as these might be experienced by the Métis in the Local and Regional Study Areas as a result of the project, will the Partnership reassess the potential impacts and identify and implement mitigation measures to address effects as these might be experienced by the Métis? • If yes, what process will be used to conduct this reassessment and the identification of residual impacts as these might be experienced by the Métis? • If no, please provide a rationale and justification. 	CEC Rd 2 MMF-0077a	MMF-0039a
						<ul style="list-style-type: none"> • How will impacts on the resource economy of the Métis be identified and managed, particularly in the absence of an AEA between Manitoba Hydro and the Métis, and given the lack of mitigation and offset programs included in the AEAs between Manitoba Hydro and the KCNs? 	MMF-0039b	<ul style="list-style-type: none"> • Is the Partnership prepared to negotiate an Adverse Effects Agreement with the MMF to mitigate and offset impacts on the resource economy as these are anticipated to be experienced by the Métis? 	CEC Rd 2 MMF-0077b	MMF-0039b
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PCN	N/A	Keeyask Transmission Project EA Report Appendix E	N/A	Aquatic Environment		<p>Given that there will be more flow through turbines and less flow through the spillways following Kelsey re-running, are there any changes predicted in the effects of entrainment on various species and age classes of fish?</p>	PCN-0001	<p>For clarification, the original question (PCN-001) did not refer to the Keeyask Transmission Line, but rather referenced the description of changes to the Kelsey Generating Station contained in the Transmission Line document that is the same information presented in the Keeyask Generation Project EIS.</p> <p>The original question was: Given that there will be more flow through the turbines and less flow through the spillways following Kelsey re-running, are there any changes predicted in the effects of entrainment on various species and age classes of fish? The Proponent's response states that there is no potential spatial overlap between the residual adverse effects of the Keeyask Generation Project and the Kelsey Re-running project on the aquatic VECs. Therefore any changes related to entrainment at Kelsey were not investigated in the cumulative effects assessment.</p> <p>What we are interested in is the question of how existing hydroelectric facilities up and downstream may influence the current status of fish populations in the Keeyask Study Area. Further to this is the question of whether there may be changes in future that could combine with the Keeyask project and that should be taken into consideration in the cumulative effects assessment of hydroelectric development on fish populations in the Nelson River.</p> <p>Passage through spillways or turbines can affect the survival of fish in different ways. Effects may depend on species and/or age class. If there are changes in fish passage and survival at the Kelsey Generating station, this may in turn affect downstream populations over time into the proposed Keeyask reservoir.</p> <p>We are still interested in understanding what is known about the potential effects on fish passage associated with Kelsey Re-running. Are there any data available that can inform us about the current passage of fish at the Kelsey Generating Station, and what changes if any may be predicted in future? Please clarify whether there has been any study of this question.</p> <p>Please clarify whether it is the general conclusion of the Proponent that the local effects of hydroelectric facilities upstream are not relevant to the cumulative effects assessment for species that can move outside of the Keeyask regional study area.</p>	CEC Rd 2 PCN-0009	PCN-0009
								<p>The Proponents' response to our initial question regarding the geographical scope of the cumulative effects assessment states that: "The region relevant to the assessment of effects of the Keeyask Project's biophysical environment is the Lower Nelson River downstream of Kelsey G.S., and, accordingly, this is the regional area focused on for the Existing Environment described in Section 6.2 of the Response to EIS Guidelines." One review of sturgeon migration patterns suggested that a barrier-free 250–300 km combined river and lake range may be the minimum distance necessary to support self-sustaining populations of lake sturgeon, and that migrations of free-ranging populations could extend to 750–1000 km.</p> <p>Reference Auer, N.A. 1996. Importance of habitat and migration to sturgeons with emphasis on lake sturgeon. Can. J. Fish. Aquat. Sci. 53(Suppl. 1): 152–160 (1996).</p> <p>Given the relatively limited data on sturgeon movement within the Nelson River, please comment further on whether the ability of sturgeon to pass existing dams and impoundments on the Nelson River up and down stream should not be considered relevant to the cumulative effects assessment of the Keeyask Project.</p> <p>Please clarify whether it is the conclusion of the Proponent that fragmentation of the Nelson River due to dams and flow regulation up and downstream of the Keeyask reaches is not relevant to the cumulative effects assessment of aquatic habitat disturbance on the potential for the reestablishment of self-sustaining populations of lake sturgeon.</p>	CEC Rd 2 PCN-0010	PCN-0010
								<p>We appreciate your interpretation of the data on sturgeon stocking programs to date, however, we maintain that the results of the sturgeon stocking programs in the Nelson River to date are preliminary and that a minimum of 15 to 20 years is required to develop a comprehensive assessment that is capable of providing adequate evidence of success of stocking in any particular water body.</p> <p>Pimicikamak members have expressed concerns about the long-term effectiveness of sturgeon stocking programs in the upper reaches of the Nelson River, and the ability of sturgeon populations throughout the Nelson River system to recover and become self-sustaining given the multiple dams and impoundments.</p> <p>Some description of the challenges with sturgeon stocking is provided in the Keeyask EIS. In order to better understand the challenges faced with sturgeon stocking programs, please provide an account or references to reports detailing any problematic issues faced specifically with the upper Nelson River stocking program that may be relevant to the program being proposed for the lower Nelson River.</p>	CEC Rd 2 PCN-0011	PCN-0011

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PCN	R-EIS Guidelines	6.4 Effects and Mitigation Aquatic Environment; TAC Public Rd 2 Aboriginal and/or Public Comments – 0003a	N/A	Aquatic Environment	<p>The results of the stocking programs described in the response to a previous request for information on sturgeon stocking programs suggests very preliminary, and mostly anecdotal results of efforts to stock sturgeon in other parts of the Nelson River, and in other river systems. Testing of artificial spawning shoals has had mixed results and is still in the early stages. Current initiatives are promising and should certainly be pursued in areas of the river system where stocks are severely depleted due to habitat loss.</p> <p>However, the environmental assessment suggests that a residual effect of the Project will be that stocking will increase the number of sturgeon in the reach of the Nelson River between the Kelsey Generating Station and the Kettle Generating Station.</p> <p>It concludes that: "During the operation period, no long-term adverse effects to lake sturgeon numbers in the area directly affected by the Project are expected due to mitigation measures that provide habitat for all life history stages both above and below the generating station, and an extensive stocking program."</p>	<p>1. Please clarify whether this conclusion refers primarily to the numbers of sturgeon that may be found in this reach of the river at any one time, regardless of their age or reproductive capacity. In other words, if an area is stocked regularly with several thousand hatchery raised fingerlings or age 1 individuals, the numbers would be high for a time whether or not these fish survived longer-term.</p> <p>2. Discuss further whether these conclusions as expressed in the EIS are warranted when the evidence for success of stocking initiatives is acknowledged to be very limited.</p> <p>3. Clarify whether this conclusion is warranted given the acknowledged uncertainties surrounding the access and eventual use of future habitats by sturgeon, including proposed artificial shoals.</p> <p>4. Explain whether there is sufficient evidence to conclude that the longer-term sustainability of existing reproducing populations of lake sturgeon will not be affected by this Project.</p>	PCN-0003	<p>Sturgeon stocking programs have been reviewed by others. For example:</p> <p>Smith, A. L. 2009. Lake sturgeon (<i>Acipenser fulvescens</i>) stocking in North America. Fish and Wildlife Branch. Ontario Ministry of Natural Resources. Peterborough, Ontario. 17 p + appendices.</p> <p>The author of this publication concluded that:</p> <p>"Lake sturgeon stocking has occurred for over 20 years in some North American jurisdictions. Wisconsin and Michigan have the most advanced stocking programs and management experience. Overall, effective stocking strategies for lake sturgeon are limited due to the life history characteristics of slow maturity and long life expectancy.</p> <p>Stocking as a conservation strategy may be an essential tool required to rehabilitate selected lake sturgeon populations. A stocking strategy has the potential to have negative impacts on wild populations and should only be applied where a strong biological rationale exists and where other strategies have been deemed unsuitable for achieving management objectives." <p>The Keeyask EIS does provide some discussion of the challenges faced in obtaining adequate gametes given the current low levels of natural brood stock. Can the Proponent comment further on whether the stocking strategy proposed following the construction of Keeyask has the potential to negatively affect remaining wild populations in those reaches of the Nelson River?</p> <p>It may be self-evident given the extensive stocking program recommended, however, please clarify whether the proposed habitat recreation work in the Keeyask reaches or other reaches of the Nelson River is considered to be inadequate to support self-sustaining populations of wild sturgeon in the future in the absence of artificial stocking.</p> </p>	CEC Rd 2 PCN-0012	PCN-0012
								<p>Manitoba Hydro's Lake Sturgeon Stewardship & Enhancement Program (2012) description states:</p> <p>"Augmentation and/or manipulation of flow could mitigate some of the changes in habitat (such as decreased benthic production) that may result from fluctuations in water levels and flows downstream of hydroelectric peaking facilities. However, manipulating or augmenting flow at one facility may require alterations in flow at other facilities and is limited by water power licenses." (p.13-14)</p> <p>Given that the application for a final water power licence for the CRD is currently being reviewed and the licence for LWR will soon be reviewed, has there been any study to consider alterations in flow patterns throughout the Nelson River for the benefit of sturgeon?</p> <p>Specifically, has there been any consideration to alter flow patterns at Jenpeg or Kelsey for the benefit of the downstream aquatic environment? This may be relevant to Keeyask if upstream flows were altered significantly in future.</p>	CEC Rd 2 PCN-0013	PCN-0013
								<p>Manitoba Hydro's Lake Sturgeon Stewardship & Enhancement Program (2012) mentions the research into sturgeon culture at the Silas Ross Memorial Sturgeon Rearing Facility; the sturgeon stocking in the upper Nelson River; the spawning studies on Playgreen Lake 1995; and movement studies on Sipiwesk Lake to Kelsey GS.</p> <p>Please provide the location of any reports or study plans for these studies if they are referenced in the Keeyask EIS (I probably missed this), or available elsewhere. This is relevant to the Keeyask EIS in furthering understanding of the state of knowledge regarding mitigation measures in the Nelson River, and historical change in the Nelson River to contribute to cumulative effects assessment.</p>	CEC Rd 2 PCN-0014	PCN-0014
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PFN	PE SV	2.1 Climate Change reference to IPCC 2001; 2.2.1.2 Future Climate Change Scenarios	N/A	Physical Environment		<p>The references for both the Climate Change and Climate Change future scenarios are out of date. Climate science and modeling has advance significantly since 2007 (the date of the IPCC's 4th assessment report). The earth's GHG emissions have already suppressed the "worst case" emissions scenario outlined in the 4th assessment report. This out-dated science is a major shortcoming of the assessment of the sensitivity to climate impacts.</p> <p>1) Provide updated climate modeling, include IPCC worst-case data.</p>	PFN-0007	<p>The proponent states that the 4th Assesment Report (coupled model intercomparison, CMIP3) is sufficient. This modeling is based on 2005/6 data and is a collection and summary of a selection of GHG emissions scenarios. Since even the most extreme emissions scenario from the CMIP3 (the A2 scenario) has already been exceeded, this is no longer a reliable indication of future climate conditions.</p> <p>1) Explicitly, which of the emissions scenarios are you basing your analysis on and explain why this is a valid indication of future climate conditions? 2) Does Manitoba Hydro intend to update its climate changes modeling? 3) Would Manitoba Hydro indicate if it used the A2 scenario in CMIP3?</p>	CEC Rd 2 PFN-0048	PFN-0048
PFN	R-EIS Guidelines	5.3.1- Assessment Framework Steps	N/A	Physical Environment	<p>Study areas for each VEC's are variable and the reason given is to ensure that effects described as a percentage of the area appear small.</p>	<p>1) Which methods and metrics did Manitoba Hydro consider before using the study area per VEC approach in the EIS? 2) Why are affected areas (VECs) not calculated as part of the LSA and RSA?</p>	PFN-0009	<p>Question Misinterpreted IR: This wasn't said as the rationale in the EIS. There were rationale provided, however these conveniently all ensure that the percentages remain small.</p> <p>"The study areas selected are large enough to capture the effects of the Project, but not so large as to mask the effects of the Project (by making the effects of the Project as a percent of the area appear unreasonably small)."</p> <p>If the proponent considers the data collected for some VECs unreasonably small, then why didn't KHLP re-evaluate their approach to VECs?</p>	CEC Rd 2 PFN-0049	PFN-0049
PFN	R-EIS Guidelines	6.0 Environmental Effects Assessment	Table 6-6	Terrestrial Environment	<p>Summarized in relevant sections (of chapter 6) and in detail in the TE SV all of the hydrological systems as far as zone 6 and beyond are physically connected.</p>	<p>1) Did Manitoba Hydro test different methods to determine LSAs and RSAs? 2) Were these LSA and RSA identified specifically so thresholds for change in habitat would not be exceeded? 3) Will Manitoba Hydro provide a table for all VEC's showing total area lost, altered and disturbed by construction, operation including residual effects and cumulative effects across all 6 study zones (or at the very</p>	PFN-0010	<p>Why is there no quantified pre-development baseline provided?</p> <p>How is it possible to avoid a true assessment of cumulative effects (eg. which include other Hydro projects and infrastructure) and still create the appearance of no significant cumulative effects?</p> <p>The proponent draws a box around the ecosystems present in their RSA and suggests that those ecosystems outside of that box aren't relevant.</p> <p>1) Where is the data to support the Proponent's statement that Keeyask will not affect the ecosystem outside of the study area?</p>	CEC Rd 2 PFN-0050a	PFN-0050a
								CEC Rd 2 PFN-0050b	PFN-0050b	
								CEC Rd 2 PFN-0050c	PFN-0050c	

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						least for both LSA and RSA?)		This assessment uses ecosystems characteristics that ignore any potential effects from existing and proposed projects, rather than taking into account existing and proposed projects to assess any potential effects on ecosystems. They are not looking at cumulative effects through the lens of Keeyask, rather than looking at Keeyask through the lens of cumulative effects. Why does KHLF deem it unnecessary to account for potential effects that maybe be caused by current and proposed Hydro projects? (In light of the CEC findings in their Wuskwatim report.)	CEC Rd 2 PFN-0050d	PFN-0050d
PFN	R-EIS Guidelines	6.3.12 Sensitivity of Project Effects to Climate Change	6-227	Physical Environment	The examination of the sensitivity to climate change focused on the operation phase as the construction period will take place in the near term and climate change is a longer-term phenomenon. The EIS references given are dated 2003 and 2007.	1) Why did Manitoba hydro ignore climate change scenarios and models available since 2007? 2) Did Manitoba Hydro compare recent climate science to 2003, 2007 references and choose older climate science?	PFN-0011	The CEAA remains more out of date than the IPCC 4th assessment report. So much has happened in the field of climate science in the last 10 years, this reference should no longer be relied upon for upholding best practices. Verify that KHLF is using the most recent climate change and scenarios data available.	CEC Rd 2 PFN-0051	PFN-0051
PFN	R-EIS Guidelines	6.3.12 Sensitivity of Project Effects to Climate Change	6-227	Physical Environment	The examination of the sensitivity to climate change focused on the operation phase as the construction period will take place in the near term and climate change is a longer-term phenomenon. The EIS references given are dated 2003 and 2007.	1) Which IPCC 2007 model or scenario did Manitoba hydro use for the EIS? 2) What System does Manitoba Hydro use to update its engineers managers and scientists regarding climate change?	PFN-0012	"Between the years 2000-2009, growth in CO2 emissions from fossil fuel burning was, on average, 3% per year, which exceeds the growth estimated by 34-35 of the 40 SRES scenarios. Human-caused greenhouse gas emissions set a record in 2010, a 6% jump on 2009 emissions, exceeding even the "worst case" scenario," cited in the IPCC Fourth Assessment Report. Explain why GHG emissions scenarios A1B and A2 do not reflect the current trajectory of global greenhouse gas emissions.	CEC Rd 2 PFN-0052	PFN-0052
PFN	R-EIS Guidelines	Section 6.9 – Effects of the Environment on the Project	N/A	Physical Environment	The Project has been designed to safely pass the probable maximum flood (PMF).	1) How many times have Manitoba Hydro reservoir water levels exceeded PMF levels? 2) How would climate change affect water levels for a 1:10,00 flood event for Keeyask? 3) Has Manitoba Hydro run climate change models specific to worst-case scenarios for both floods and droughts? 4) Do the conclusions in the EIS re: probable maximum flood correlate with recent climate change models—worst-case scenarios?	PFN-0014	The proponent states in their IR response: "The estimated PMF for the Keeyask Project is nearly double the highest recorded daily average flow on record. As a result, reservoir water levels would not be expected to exceed estimated PMF levels." In the recent rainstorm in Toronto: "Environment Canada said some parts of the GTA had been drenched with more than 100 millimetres of rain, trouncing the previous one-day rainfall record of 29.2 mm in 2008 for Toronto and even beating the 74.4 mm monthly average for July." [Quote from Globe and Mail]. With the statement that has been made, does the proponent still think that they should not re-evaluate the PMF suggested in the EIS? Explain your reasoning.	CEC Rd 2 PFN-0053	PFN-0053
PFN	TE SV	1.3.4 Valued Environmental Components and Supporting Topics	1-13	Terrestrial Environment	The proponent states that those VEC's and STs selected were those that could potentially experience substantial project effects yet the EIS Chapter 6 says all significant effects to VECs and Supporting Topics were ultimately described as being non-significant.	1) How did Manitoba Hydro decide whether a terrestrial concern was a ST or a VEC? 2) What is the technical and scientific basis for these determinations of non-significant effects?	PFN-0015	Provide the scientific basis behind The Response to the EIS Guidelines, Section 5.5 Approach to Determination of Regulatory Significance?	CEC Rd 2 PFN-0054	PFN-0054
PFN	R-EIS Guidelines	6.5 Terrestrial Environment	N/A	Terrestrial Environment		The EIS indicates that effects of fragmentation and habitat losses are insignificant due to their being other habitat in the region. Significant, long term amphibious habitat losses (27%), within RSA is identified, yet it is stated that there are a lot of amphibians in the RSA since the project effects area represents small portion of regional study area. 1) What will Manitoba Hydro do to mitigate loss of 27% amphibian habitat? 2) The reference to amphibians in the RSA: did Manitoba Hydro use recent scientific data regarding the rapid decline of amphibians in North America?	PFN-0016	This IR response is an example of the proponent using the Zones to ensure that the percentage changes are small. Eg percent change in zone 3 = 27%, percent change in zone 4 = 3%, so they are using zone 4. How are off system marshes a proper way of mitigating the destruction of an untouched ecosystem? Explain your reasoning. Amphibian populations worldwide have been in decline due to, among other things, habitat loss, pollution and climate change. Between a third and half of all amphibian species are currently threatened with extinction. Being an amphibian species, and given the dire context of amphibians globally, why is the Northern Leopard Frog not considered a Valued Ecosystem Component?	CEC Rd 2 PFN-0055a CEC Rd 2 PFN-0055b	PFN-0055
PFN	N/A	EIS Supplemental Filing 1 - 2012 Keeyask Traditional Plants Workshop Summary	3	Physical Environment	In deference to Aboriginal and Treaty rights for people of all ages to have access to the land, changes in water level make it difficult to land a boat and access land along altered shorelines. Shoreline erosion being predicted to carry on for many years confirms the road for access.	How will members of TCN, WLFN, FLCN and YFFN be supported to carry out monitoring of their lands and medicinal plants in areas above proposed new water levels during each phase of the project?	PFN-001a	Will "ATK monitoring involve the development and implementation of annual monitoring programs.....related community concerns about potential effects" or not? Please explain. How will the ATK contents and results from monitoring plans be provided to regulators in order to assess the project and its licensing conditions?	CEC Rd 2 PFN-0056	PFN-0056
						What is the plan to coordinate with knowledge holders in each community to identify critical places where water access needs to be maintained? Does this plan include shoreline remediation, riparian buffer and bank stabilization, dock building, or other appropriate measures (detailed within a specific timeframe) to assure Aboriginal and Treaty rights are supported not infringed?	PFN-001b	How will the Waterways Management Program information for the pre flooding and post flooding period be: - provided to affected communities - made public and be incorporated into ongoing monitoring and environmental management programming for Keeyask? Was the Keeyask Waterways Management Program information filed with the EIS for Keeyask? If not, why not, and will Manitoba Hydro file it now?	CEC Rd 2 PFN-0057	PFN-0057
PFN	N/A	EIS Supplemental Filing 1 - 2012 Keeyask Traditional Plants Workshop Summary	3	Terrestrial Environment	Trees and plants have already been destroyed by hydro developments. The EIS states people will have to go further to access intact (uncontaminated) medicinal plant areas.	Answer the following questions: 1) Have suitable alternative plant gathering areas been located by traditional knowledge keepers? Provide documents and/or plans to define "further" in distance and time. 2) Has Hydro made a formal commitment to provide travel services, available on demand, as the need to access medicinal plants is triggered by illness and accidental injury? What limitations will interfere or prohibit travel arrangements? 3) Are provision in place for access coordinated around plant life cycles and harvest times?	PFN-0002	How will the Aboriginal rights to gather, hunt, track, and use crown lands and waters of those Aboriginal citizens who are not members of the KCNs be accommodated? Do the AEA offsetting programs negotiated include accommodating the Aboriginal rights of other First Nations within the RSA, LSA, and with respect to the reservoir, and offsetting programs? Do the various Agreements which the KCNs have negotiated with Manitoba Hydro also acknowledge the rights of Aboriginal persons and communities who are not KCNs?	CEC Rd 2 PFN-0058	PFN-0058
PFN	N/A	EIS Supplemental Filing 1 - 2012 Keeyask Traditional Plants Workshop Summary	5	Terrestrial Environment	Medicinal plants are gathered for personal use from areas identified by families who share that information within the bounds of personal relationships (plant location is not generally shared or mapped, YFFN was determined not to share mapping information at the 2012 workshop), and numerous areas of traditional harvest will be destroyed and/or degraded.	Answer the following questions: 1) Are people from TCN, WLCN, FLCN and YFFN who harvest medicinal plants afforded access to all newly identified medicinal plant locations? 2) Will communities share harvesting sites and coordinate within and between each other to protect and manage these sites? 3) How has Hydro documented and communicated their commitment to finding a solution regarding medicinal plants that is amenable to all parties?	PFN-0003	These questions were not answered in Round 1. Cross reference to 002 not relevant as answers are not provided. Please provide answers. Which KCN will have access to newly identified medicinal plant locations? How is a newly identified medicinal plant location confirmed by knowledgeable First Nation land users? How are the Aboriginal rights of non KCN members going to be supported and accommodated with respect to gathering medicinal plants?	CEC Rd 2 PFN-0059	PFN-0059
								Provide an estimate of the size of the quarry and rock access sites in the river and lake identified in the EIS.	CEC Rd 2 PFN-0060a	

Department	Volume / Document	Line Number / Table Number / Figure Number	Page	Topic	Context / Preamble e.g., provide applicable background/rationale for providing the comment	Specific Department Comment / Request for Additional Information:	Round 1 Proponent Response	Round 2 Intervenor Question	Round 2 Response #	original intervenor IR#
PFN	N/A	EIS Supplemental Filing 1 - 2012 Keeyask Traditional Plants Workshop Summary	4	Terrestrial Environment	Borrow pits from Hydro development (past and present) have been raised as a concern in all three medicinal plant workshops, as they have been left in a degraded state and lay bare for opportunistic grass and weeds—workshop participants have proposed these areas be restored in a balanced way with useful plants, including berries. Doing this would alleviate scars that remain visible on the landscape and could serve as part of a field-based educational science program, an expressed goal for communities.	Answer the following questions: 1) In number and surface area, what amount of land has been degraded by borrow pits within the project area to date? And, amount planned over the next 10 years? 2) What percentage of that surface area has been restored to date in keeping with ATK and practices, repeatedly shared in workshops since the first in 2009? 3) Is there a commitment in place to restore borrow pits in culturally appropriate ways, going forward? What are the specific targets in scale and time. 4) Has Hydro dedicated funding specifically for classroom and field-based science curriculum with regard to medicinal plant knowledge and plant conservation?	PFN-0004	Provide Manitoba Hydro and KCN standards to rehabilitate borrow pits in a 'culturally appropriate way.' What does Manitoba Hydro mean ' could include restoration in culturally appropriate ways' ? What vegetation will be used to rehabilitate borrow pits in a culturally appropriate way ? Answer specifically with respect to the Main Camp Decommissioning contracts. Will the Keeyask Centre be in place during construction and will programming there as per your answer to the IR be in place during construction? Is the Keeyask Centre operating now? What does the Keeyask Generation project or other projects fund or provide at this Centre?	CEC Rd 2 PFN-0060b CEC Rd 2 PFN-0060c	PFN-0060
PFN	PE SV	2B-6 Greenhouse Gas Reporting and Commitments	N/A	Physical Environment	The EIS states it is feasible to propose site-specific adaptation strategies that deal with potential impacts of climate change on the local environment of Keeyask.	1) What are the site-specific adaptation strategies to deal with; a. Medicinal plant locations? b. Calving and wintering locations for caribou? c. Migration of habitat types due to climate change? d. Change in habitat locations for endangered species? e. Additional listed and endangered species?	PFN-0008	Will Manitoba Hydro have site specific climate adaptation strategies in place for the Keeyask Generation Station project? This question pertains to roads, dikes, offices, housing, cement operation, all vehicles, and all stages of construction and operation? Manitoba Hydro says it "will continue to advance the state of knowledge of climate change impacts at the system wide scale....." Is that knowledge applied in the Keeyask EIS and filings, and will the system wide knowledge of Manitoba Hydro re climate change impacts be made available to Keeyask participants ?	CEC Rd 2 PFN-0061a CEC Rd 2 PFN-0061b	PFN-0061
PFN	R-EIS Guidelines	5.3.1- Assessment Framework Steps	N/A	Physical Environment	Study areas for each VEC's are variable and the reason given is to ensure that effects described as a percentage of the area appear small.	1) Which methods and metrics did Manitoba Hydro consider before using the study area per VEC approach in the EIS? 2) Why are affected areas (VECs) not calculated as part of the LSA and RSA?	PFN-0009	Based on the IR round 1 answer advise the participants and the CEC where the EIS Guidelines and regulatory framework direct the proponent not to use an ecosystem framework to identify environmental effects for the combined project area and for combined habitat and location for VECs.	CEC Rd 2 PFN-0062	PFN-0062
PFN	R-EIS Guidelines	6.3.12 Sensitivity of Project Effects to Climate Change	6-227	Physical Environment	The examination of the sensitivity to climate change focused on the operation phase as the construction period will take place in the near term and climate change is a longer-term phenomenon. The EIS references given are dated 2003 and 2007.	1) Which IPCC 2007 model or scenario did Manitoba hydro use for the EIS? 2) What System does Manitoba Hydro use to update its engineers managers and scientists regarding climate change?	PFN-0012	<ul style="list-style-type: none"> How will Manitoba Hydro keep its climate change scenario and modeling for Keeyask up to date during the construction phase - and what is the plan to be up to date regarding climate change prior to operation of Keeyask Generation Station ? What are Manitoba Hydro's ' established climate change strategies that shape the organization's to climate change' ? How did the department in Manitoba Hydro studying climate change 'update decision makers' regarding the Keeyask project ? What are Manitoba Hydro's climate change impact studies ? Are these studies available to Keeyask participants ? Provide a listing of these studies. Provide a listing of any climate change studies Ouranos undertook for Manitoba Hydro. You have referenced Manitoba Hydro's Climate Change Strategies in answering IR 0012. Were any of the results of Manitoba Hydro's Research Management Board's climate change projects applied to planning for Keeyask ? Will any of the results of these various research, and statistical projects be applied to construction or operations for Keeyask ? If the intention is for the outcomes from these projects to be applied to the construction or operation phases of Keeyask please provide full information about these climate change projects. Please provide Keeyask participants and the CEC with the details of the climate change research, statistical and downscaling projects currently underway through the Manitoba Hydro Research Management Board – as these are relevant for the future operations of Keeyask, and connected projects. (Referenced in the EIS and in IR 0012 response.) Given these climate change programs and investments with Ouranos and others as per PE SV Appendix 2 B are paid for with public funds, and revenues of a public utility please advise the reporting mechanism regarding these climate change programs, and research projects. 	CEC Rd 2 PFN-0063	PFN-0063
PFN	R-EIS Guidelines	6.5 Terrestrial Environment	N/A	Terrestrial Environment	The EIS indicates that effects of fragmentation and habitat losses are insignificant due to their being other habitat in the region. Significant, long term amphibious habitat losses (27%), within RSA is identified, yet it is stated that there are a lot of amphibians in the RSA since the project effects area represents small portion of regional study area.	1) What will Manitoba Hydro do to mitigate loss of 27% amphibian habitat? 2) The reference to amphibians in the RSA: did Manitoba Hydro use recent scientific data regarding the rapid decline of amphibians in North America?	PFN-0016	Is Manitoba Hydro suggesting that the loss of 27 % of the amphibians in Zone 4 from Keeyask project effects is not a significant or relevant effect of the project ? Is Manitoba Hydro suggesting that all amphibians are able to recover their population and habitat by moving into decommissioned burrow pits ? InWhich zone are these de commissioned burrow pits which will provide habitat for recovering amphibian populations located ? Is Manitoba Hydro suggesting that 'rapid declines in North America amphibian populations occurred only during the 1970's'? Did Manitoba Hydro use the decline of amphibians in Manitoba in the period between 1970 and 2005 for the basis of this area of the EIS ?	CEC Rd 2 PFN-0064a CEC Rd 2 PFN-0064b	PFN-0064
PFN	R-EIS Guidelines	6.5 Terrestrial Environment	N/A	Terrestrial Environment	The range of natural variability appears to be used as a reassurance that significant effects whenever and wherever found, are natural.	1) How did Manitoba Hydro determined the natural range of variability, and why are they sure that changes to VEC's and supporting topics don't vary significantly? 2) Why did Manitoba hydro use different indicators for different VEC's without a technical explanation? 3) Provide a table for all VECs 4) Would Manitoba Hydro provide clear rationale for determinance of percent range or other predicted changes being insignificant or within natural range of variability?	PFN-0018	Not answered. Please provide answer to the question. Does Manitoba Hydro use any other source than a twenty year old CCFM set of forest criteria and indicators to provide a basis for answer to this question ? Why did Manitoba Hydro not cite or use the 2006 and 2008 updates to these CCFM indicators and criteria ?	CEC Rd 2 PFN-0065	PFN-0065

Department	Volume / Document	Line Number / Table Number / Figure Number	Page	Topic	Context / Preamble e.g., provide applicable background/rationale for providing the comment	Specific Department Comment / Request for Additional Information:	Round 1 Proponent Response	Round 2 Intervenor Question	Round 2 Response #	original intervenor IR#
PFN	R-EIS Guidelines	5.5 Approach to Determination of Regulatory Significance	N/A	Response to EIS Guidelines		Please answer the following questions: 1) What is Manitoba Hydro's definition of natural variability? 2) How is sensitivity to disturbance assessed? Methodology? 3) How is VEC capacity to change assessed? 4) Why were geese and ducks (pg. 630, 633) not evaluated further despite text describing adverse, long term impacts to their habitat?	PFN-0020	Question # 1 The reference in answer to this IR is provided as Terrestrial Environment Supporting Volume Section 1.4.3 In the IR response Manitoba Hydro provides this reference which a list of Effects Benchmarks and says "the types of benchmarks used were :"(see list) In the Reference within the volume Section 1.4.3 Manitoba Hydro indicates that there is a " lack of generally accepted scientific standards.....benchmarks used to assess Project effects varied depending onone or more of the following:" (see same list) Explain the difference in the above statements, and explain then which of the items in the list were used to arrive at effects assessment for each VEC etc for Keeyask. Provide clear statements as to which specific example of the elements in this list were used for each VEC assessment. In particular provide a listing of the detailed sources for each of the elements in this list. Original question was NOT answered. Manitoba Hydro definition of natural variability, which is in the list, should be provided.	CEC Rd 2 PFN-0066a	PFN-0066
								Question # 4 There is no answer to the question regarding geese in this IR. First Nation hunters in other regions of Manitoba utilize the same goose resource in their hunt. Explain how the access and rights to this resource for Aboriginal hunters will be maintained despite the admitted adverse, long term impacts to their habitat?	CEC Rd 2 PFN-0066b	
PFN	AE SV	2.5 Water Quality	N/A	Aquatic Environment	Water bodies act as large natural sinks for sequestering anthropogenic carbon emissions. Carbon enters the aquatic environment in the form of dissolved carbon dioxide (CO2), which then binds to calcium carbonates. Dissolved CO2 increases the acidity of the aquatic environment, which in turn slows calcium carbonate precipitation, thereby decreasing the ability of the water to absorb CO2. Vertical deep mixing is a mechanism that then transports the sequestered carbon to the deeper layers of the water column. Aquatic plants play a significant role absorbing dissolved carbon by converting it to organic material, and mitigating aquatic acidification by converting CO2 to oxygen during photosynthesis. Water bodies play a significant role in the carbon cycles of the earth and in local ecosystems, and must be considered when evaluating the impacts of carbon emissions on the environment (terrestrial and aquatic). Within the EIS materials there is limited discussion on the role water plays in the carbon cycle, and how modification to the aquatic environment, terrestrial activities, effluent discharge and flooding of peatland as a result of the Keeyask Project, will influence carbon emissions.	Please respond to the following questions: 1) How will the Keeyask Project influence the process of vertical mixing and sedimentation within the Keeyask reservoir and Stephens Lake? 2) How will the flooding of peatlands increase the amount of dissolved carbon within the aquatic environment? 3) How will change in flow regime of the Nelson River impact carbon cycles? 4) Did Manitoba Hydro conduct a cumulative carbon cycle analysis for the construction and operation phases of the Keeyask Project, which incorporates both terrestrial and aquatic carbon cycle data and mechanisms?	PFN-0024	Question# 1 was not answered. Provide an answer with respect to Keeyask reservoir, and Stephens Lake (reservoir). Questions # 3 and # 4 A reference is made to Technical Memorandum GN 9.5.5, and 9.5.6 are as being provided on the CD which contained Technical Memoranda. Advise whether there is an accessible table of contents and listing of these both alpha and numeric. Given that the technical reports for the Keeyask EIS have neither an alpha listing by title or authors, and were not included in the EIS in 2012 Manitoba Hydro needs to provide accessible listings of materials it includes in filings on a timely basis. Manitoba Hydro should advise the participants and the CEC why these technical Memoranda were not provided with the EIS.	CEC Rd 2 PFN-0067a	PFN-0067
PFN	AE SV	1.2.2.4 Selection of VECs	Table 1-1	Aquatic Environment	VECs are selected in order to act as indicators of ecosystem health. Aquatic VECs selected include; water quality, walleye, northern pike, lake sturgeon and lake whitefish. All other potential VECs were not selected on the basis that they were not deemed important for resource use by local people. The fish species selected as VECs are higher up in the foodchain, and therefore will take longer to respond to subtle changes in the aquatic environment compared to other ecosystem components. Furthermore, quantifying simply the number of fish in a given area is not a measure of ecosystem or VEC health. Specific parameters of the VEC aside from mercury concentrations must be assessed; reproductive capability, size, general health, etc, need to be measured and the culmination of those measured results be compared in a matrix to determine overall VEC health.	Please answer the following questions: 1) Explain the rationale behind selecting only the ecosystem components that are regarded as important for resource as the aquatic VECs? a. How does this rationale support the purpose of selecting VECs to monitor and measure ecosystem health? 2) Are the VECs selected strong/appropriate indicators of ecosystem health? Explain. 3) What parameters of the VECs are being measured to determine the health and vitality of the VEC? a. Provide the data in matrix format off what particular biological parameters of each VEC are being measured and how those parameters are being quantified for comparison to baseline data?	PFN-0027	Question # 3 There is a reference to ' post project monitoring' in the IR response. What does this mean ? It appears that Manitoba Hydro and its partners assume that th same ' parameters will be measured for each VEC' post project. Please inform participants and the CEC whether monitoring will continue throughout the construction phase, with analysis of the results and an indication of how data sets and results of technical work will be updated for the operation phase of Keeyask. In particular, given the data and standards used for VECs, and used in the various technical reports are often as much as 10 – 20 years out of date Manitoba Hydro should advise all parties how they will bring the basis for operation of Keeyask with respect to VECs, environmental effects, and criteria and indicators use up to date for the operation phase.	CEC Rd 2 PFN-0068	PFN-0068
PFN	R-EIS Guidelines	6.2.3.4.8 Mercury in Wildlife	N/A	Terrestrial Environment		1) What are the results from the 'historic records for mercury concentration in indicator species' near the RSA ? 2) Have any studies regarding mercury concentration in mink, or otter in the RSA, or LSA prior to filing the Keeyask EIS? 3) Have any studies regarding mercury concentration in these and other mammals been done sine those cited in this section of the EIS?	PFN-0029	Manitoba Hydro has indicated that monitoring and testing for mercury in species is ongoing. How will the ongoing monitoring and testing be reported, and used in decisions for the operation of the Keeyask project? Did Manitoba Hydro use the Manitoba Government standards for consumption of fish (assumed mercury levels) in Stephens Lake, and Split Lake as a basis for their self-assessment in the EIS?	CEC Rd 2 PFN-0069a	PFN-0069
PFN	R-EIS Guidelines	6.2.3.2.6 Surface Water and Ice Regime	N/A	Physical Environment		The EIS indicates on page 6 – 29 that " river flows to the LSA originate from the Upper Nelson River, the Burntwood River and the local inflow. 1) Will Manitoba Hydro made available statistics or data for these rivers flows, over time? This request is in an IR based on the preference of the Keeyask project managers and is to be used in the Land and Water Changes analysis, funded by CEC.	PFN-0030	Manitoba Hydro has provided the address for a public site which provides statistics for outflow data. Please confirm that this web site provides outflow data for each structure Manitoba Hydro operates. Our offices have identified the water elevation data for each reservoir only to date.	CEC Rd 2 PFN-0070	PFN-0070
PFN	PD SV	4.1 Overall System Effects	N/A	Physical Environment	The EIS materials state that the Churchill River Diversion (CRD) and the Lake Winnipeg Regulation (LWR) determine the seasonal flow patterns in the Nelson and Burntwood rivers, and consequently the flows available for all the generation stations along those rivers, including Keeyask.	Answer to the following questions: 1) Will there be no change in water levels to the Keeyask reservoir arising from the LWR and/or CRD. 2) Under special operating conditions or emergencies, can the CRD or LWR be used to augment river flows to support power generation for facilities along the Nelson River? 3) Confirm that there will be no increase to LWR water levels in order to support seasonal flows for Wuskwatim, Keeyask and Conawapa.	PFN-0032	There is no reference or content in the answer as to which Lake Winnipeg Regulation permit is the basis for in the answer. Please confirm that the answer to IR 0032 is in relation to the current Lake Winnipeg Regulation permit, and water range allowed, citing the year and number of the permit.	CEC Rd 2 PFN-0071	PFN-0071

Department	Volume / Document	Line Number / Table Number / Figure Number	Page	Topic	Context / Preamble e.g., provide applicable background/rationale for providing the comment	Specific Department Comment / Request for Additional Information:	Round 1 Proponent Response	Round 2 Intervenor Question	Round 2 Response #	original intervenor IR#
PFN	R-EIS Guidelines	7.5.2 Terrestrial Environment	N/A	Terrestrial Environment		The EIS says " Terrestrial environment ...substantially altered...continued to experience those effects today." In contrast, the Summary of Cumulative Effects of Project with Past and Current Activities (7.5.2.2), the proponent suggests that all of these previous (and significant) effects are no longer significant. 1) If all of these impacts of past projects are so significant, with long-term effects, how could the proponent be so sure that impacts of the Keeyask project will not be significant? How do you explain this? 2) What is the basis for this assumption? 3) Did the CN Partners agree that environmental effects from Keeyask are insignificant? 4) Was a list of effects of past and current projects and activities that have had significant, long-term effect on the terrestrial environment used for cumulative effects assessment?	PFN-0021	1) Two of these benchmarks ("relative degree of change from relatively natural conditions") are both weak (relative change from a relative condition) and "conditions in areas relatively unaffected by human development" are both weak. It is unlikely that the proponent is really comparing to a natural condition, since the entire hydrological system is no longer in a natural condition, and hasn't been for some time. Neither would lead to an assessment of change solely due to human intervention. QUESTION: What does the proponent consider to be a natural condition? The way this matrix is designed it makes it very unlikely that anything will advance to a Step 2 assessment. Where a Step 2 analysis was conducted, effects became acceptable because the proponent is able to choose from the following list of rationale at their convenience, which negate any adverse impacts: there won't be an adverse effect on aquatic biota (united /unreferenced assumption in the case of TSS); adverse effects offset by artificial lake stocking in the case of lake; cumulative area losses for all priority habitat types are predicted to remain below 10%; "significant" wetlands aren't affected (I all wetlands are regional or locally significant); no endangered or threatened species are known to occur in affected areas, or if there is a threatened species such as the Olive-sided flycatcher- it is found not significant because there is suitable habitat throughout the region (the question of why this species is threatened if changes to it's habitat are not significant). In short, any impact significant enough for a Step 2 assessment is then found to have non-significant effects based on the proponent's choosing. 4) QUESTION: Cite the source(s) of the methodology described in section 5-5, and the source of Figure 5-1, pg 5-12.	CEC Rd 2 PFN-0072a	PFN-0072
PFN	R-EIS Guidelines	7.3.2 Summary of Project Physical Effects	N/A	Response to EIS Guidelines		Sections in chapter 7 outline changes from a current condition (eg. % habitat change) due to the project, rather than from a historical baseline or pre-development condition across all developments in the hydrological region. Whereas Hegman et al (1999) refers to the need to assess whether an individual project is incrementally responsible for adversely affecting a VEC beyond an acceptable point. 1) How is the long term flooding expected taken into account? 2) Did Manitoba Hydro take into account any historic baseline for % habitat change data? 3) Did Manitoba Hydro include habitat change measurements from other generation station projects to establish methods to predict habitat change % for Keeyask?	PFN-0022	1) The proponent is measuring change from current, not a historical baseline 2) "The proponent refers to CAC-0012, which states: Ultimately, the focus of the assessment was on the future rather than on the past, i.e., on examining the vulnerability of each VEC today and in the future without the Project (due to whatever factors might affect this vulnerability), in order to help in identifying the extent to which incremental effects on a VEC from additional changes caused by the Project could potentially result in a cumulative significant adverse effect on the VEC." "For historical conditions, [the temporal scope was determined separately for each key topic] as far into the past as needed to describe historical conditions and trends, subject to the availability of relevant historical information" (emphasis added)." The proponent then refers to key historical habitat data incorporated into the study, but this was only performed within the Regional Study Area and only considers historical changes such as those from settlements, roads and transmissions lines... not from flooding. They conclude: "In summary, in accordance with good practice for a project-focused EIS carried out to meet regulatory environmental assessment requirements, available and relevant information on pre-disturbance conditions was considered in the significance assessments of the Project's residual effects for all VECs identified for the Project's environmental assessment." QUESTION: Please state the total area of habitat loss to date due to settlements, roads and transmission lines in the combined RSAs for the generation stations on the Nelson River, and in and assumed in the Keeyask Regional Study Area. Also, please state the amount of land area that has been flooded as a result of hydroelectric development in Manitoba to date, as this was omitted from the historical analysis described in CAC-0012 and CEC-0020.	CEC Rd 2 PFN-0073	PFN-0073
PFN	PE SV	2.1 Climate Change reference to IPCC 2001; 2.2.1.2 Climate Change future scenarios date to 2001	N/A	Physical Environment		The EIS makes an assumption of no change in variability or frequency of weather events compared to present day (pg. 100). "It is contradictory to use climate modeling that assumes no change in variability, yet changes in variability are predicted. This contradicts the IPCC that states, "type, frequency and intensity of extreme storm events are expected to change as earth's climates changes" (pg 111). 1) What does Manitoba Hydro see as the variability of weather and climate in the region, based on IPCC statement above?	PFN-0023	Manitoba Hydro is pointing us to the fact that they use the best available climate modeling for their assessment, yet implicitly acknowledge that it is insufficient (see IR-0011). In these cases, the best that they used is outdated. By using the Delta model, the proponent admits that it has not incorporated the potential for changes in variability or frequency of weather events compared to the present day. At the same time, it acknowledges on page 2-19 of the Physical Environment Supporting Volume that the type, frequency and intensity of extreme events are expected to change as Earth's climate changes. The proponent also acknowledges that the conclusions made in Table 3 of the Technical Memorandum are global or continental scale, not specific to smaller regions such as the Keeyask study area. So, in other words, Manitoba Hydro doesn't have good local data to support the assessment of local impacts. How will Manitoba Hydro update and improve its local and climate change data so that the Keeyask climate change effects assessment is based on models and standards in the 2013 IPCC Assessment ?	CEC Rd 2 PFN-0074	PFN-0074
PFN	AE SV	2.5 Water Quality	Table 2-13 Residual Effects on Water Quality	Aquatic Environment	Residual effects on water quality for Split Lake and Stephens Lake reservoir are predicted to be negligible for the construction and operation phases of the Keeyask project.	Please respond to the following questions: 1) Explain how these conclusions were arrived at? 2) Provide the water quality baseline data for the Split Lake and Stephens Lake. 3) How are the water levels in Stephens Lake predicted to fluctuate in response to the Keeyask Project?	PFN-0035	Explain why Stephens Lake is used as a proxy area. Were other reservoirs or lakes in the Hydro system considered as a possible proxy?	CEC Rd 2 PFN-0075	PFN-0075
PFN	AE SV	2.5.1.3.3 Treated Sewage Effluent	N/A	Aquatic Environment	The EIS materials predict that since sewage effluent will be treated (limit Total phosphorous levels to 1mg/L) and due to high river discharge, there will be limited effects of nutrient loading in the lower Nelson River. Phosphorous is a limiting nutrient for macrophyte and phytoplankton growth. Increases in baseline P levels would inadvertently alter the density of plant and algae in the Stephens Lake reservoir.	Please respond to the following questions: 1) What is the predicted flow rate of treated effluent being released into Stephens Lake per hour, during the construction and operation phases of the project? Explain. 2) Where will the effluent from the Keeyask Project be released? Stephens Lake? 3) Will the phosphorous and nitrogen rich effluent released into Stephens Lake impact growth of blue-green algae and other phytoplankton. 4) Do the predicted phosphorous levels also include contributions from other nutrient rich effluent sources originating from the project; peatland flooding, waste water, concrete batch plant effluent, dewatering etc? 5) Has the impact to nitrogen and phosphorous ratios been investigated? If not, why not?	PFN-0036	Question # 2 Please confirm that effluent that will be released into the Nelson River, as per IR response, will also then travel via the Nelson River through Stephens Lake. Question #2: Provide information as to other waste from Keeyask Generation Station project that will be disposed of in Gull Lake prior to it becoming a reservoir. (Quantity, type, effects,etc.)	CEC Rd 2 PFN-0076a CEC Rd 2 PFN-0076b	PFN-0076
						Please respond to the following questions:		Question # 2 Provide the missing content at line 70 and line 77 where Error ! Reference source not found appears in the IR Response.	CEC Rd 2 PFN-0077a	

Department	Volume / Document	Line Number / Table Number / Figure Number	Page	Topic	Context / Preamble e.g., provide applicable background/rationale for providing the comment	Specific Department Comment / Request for Additional Information:	Round 1 Proponent Response	Round 2 Intervenor Question	Round 2 Response #	original intervenor IR#
PFN	AE SV	1A.2.1 Structures in Water-Construction Scheduling	N/A	Aquatic Environment	The construction of in-water structures will be scheduled to avoid sensitive periods for fish; spawning periods.	1) How will the integrity of fish habitat be monitored throughout Keeyask construction and operation phases, and the different seasons? 2) How does the Environmental Protection Program for aquatic habitat make provisions to protect sensitive fish habitat? 3) What are the standards for maintenance and monitoring of sensitive fish habitat?	PFN-0037	Question # 3 Confirm that there is currently no Aquatic Effects Monitoring Plan for Keeyask Generation Project. Advise participants and the CEC whether this information will be available for discussion and questions during the CEC hearings, or sooner. When will this plan be available for public review as per the regulatory process for DFO and MCWS?	CEC Rd 2 PFN-0077b	PFN-0077
PFN	TE SV	2.8.4.3 Residual Effects Conclusions (to Wetlands)	N/A	Terrestrial Environment	EIS materials indicate the overall residual effects of the project on wetland function are expected to be adverse, irreversible and continuous in frequency but low in ecological context. However on a global, national and provincial level, wetland impacts are considered nil, as significant amounts of wetlands on that scale are not impacted. Losses to native wetland types is predicted to be less than 10% in the historical area.	Please answer the following questions: 1) Why did Manitoba Hydro compare the loss of wetlands in Manitoba on a global and national scale? Why is that a relevant analysis? 2) What is the current state of wetlands in Manitoba? 3) Did Manitoba Hydro seek to incorporate aspects of peatland conservation outlined within the Manitoba Government Tomorrow Now – Green Plan? 4) For what length of time were the residual effects to wetlands calculated for? 30 years? 5) What model was used to assess for loss of wetlands over time, and did this model incorporate; a. Future Manitoba Hydro projects? b. Climate change? c. Anthropogenic activity?	PFN-0038	Question 4 Based on the intention to gauge and assess effects on wetlands for the 40 years that include the construction and first 30 years of operation, provide details on how effects on wetlands during the construction period will be monitored and mitigated.	CEC Rd 2 PFN-0078	PFN-0078
PFN	TE SV	2.10 Cumulative Effects with Other Projects	N/A	Terrestrial Environment	The cumulative impact of the Keeyask Generation project was assessed in conjunction with future Manitoba Hydro developments; Gillam Redevelopment project, Bipole III transmission line, Keeyask Transmission Project and the Conawapa Generation Project. For all assessments examining combined future project cumulative effects to intactness, ecosystem diversity and wetland function, no cumulative effect was reported. It was not discussed how the conclusions were arrived at, what baseline values or parameters were evaluated to calculate the cumulative impacts.	Answer the following questions; 1) How was it determined that there were no overall net cumulative effects from all projects combined on the terrestrial environment? 2) How were the terrestrial VECs evaluated during this assessment? 3) How will the terrestrial VECs be assessed during construction and operation phases of the Keeyask project? 4) The assessment needs to be repeated, using pre-Manitoba Hydro development data (1970s) as the baseline value. Qualitative and quantitative measures of change need to be established which are comparable/measurable between all project future projects. Finally, Manitoba Hydro will have to provide the results of the assessment, and include a geographic depiction of cumulative impacts over time.	PFN-0042	Question # 3 Question not answered. Answer required still. Questions regarding ongoing monitoring and collection of data to make sure that data and information is still relevant at the time of operation of Keeyask should not be dismissed in answering IRs. Assessment that is theoretical and conducted 10 – 40 years before effects needs to be become living assessment, and updated throughout.	CEC Rd 2 PFN-0079	PFN-0079
PFN	N/A	Project Description Supporting Volume; Terrestrial Environment Supporting Volume	N/A	Terrestrial Environment	The Keeyask Generation EIS LSA and RSA have overlap with Forest Management Units 86, and 76. Manitoba Hydro has included assessment information that include habitat in these FMUs.	1) What data sources regarding the FMUs did Manitoba Hydro use? 2) Did Manitoba Hydro contribute to the Manitoba Forest Resource Inventory due to its technical and scientific studies? 3) Was the FRI data, or forest ecosystems data used in determining the Zones, which in turn are the context for analysis for VECs? 4) This request is in IR form, and includes a request for the data regarding the questions above. This IR is based on the request of the Keeyask Generation project managers.	PFN-0044	Question # 4 Manitoba Hydro has made a mistake, as this IR has nothing to do with MWL IR # 0051. An LCA analysis is not the same as land and water change over time analysis. We request that this IR be answered fully to correct the mistake.	CEC Rd 2 PFN-0080	PFN-0080

Department	Volume / Document	Line Number / Table Number / Figure Number	Page	Topic	Context / Preamble e.g., provide applicable background/rationale for providing the comment	Specific Department Comment / Request for Additional Information:	Round 1 Proponent Response	Round 2 Intervenor Question	Round 2 Response #	original intervenor IR#
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PCN	N/A	Keeyask Transmission Project EA Report Appendix E	N/A	Aquatic Environment		Given that there will be more flow through turbines and less flow through the spillways following Kelsey re-running, are there any changes predicted in the effects of entrainment on various species and age classes of fish?	PCN-0001	<p>For clarification, the original question (PCN-001) did not refer to the Keeyask Transmission Line, but rather referenced the description of changes to the Kelsey Generating Station contained in the Transmission Line document that is the same information presented in the Keeyask Generation Project EIS.</p> <p>The original question was: Given that there will be more flow through the turbines and less flow through the spillways following Kelsey re-running, are there any changes predicted in the effects of entrainment on various species and age classes of fish?</p> <p>The Proponent's response states that there is no potential spatial overlap between the residual adverse effects of the Keeyask Generation Project and the Kelsey Re-running project on the aquatic VECs. Therefore any changes related to entrainment at Kelsey were not investigated in the cumulative effects assessment.</p> <p>What we are interested in is the question of how existing hydroelectric facilities up and downstream may influence the current status of fish populations in the Keeyask Study Area. Further to this is the question of whether there may be changes in future that could combine with the Keeyask project and that should be taken into consideration in the cumulative effects assessment of hydroelectric development on fish populations in the Nelson River.</p> <p>Passage through spillways or turbines can affect the survival of fish in different ways. Effects may depend on species and/or age class. If there are changes in fish passage and survival at the Kelsey Generating station, this may in turn affect downstream populations over time into the proposed Keeyask reservoir.</p> <p>We are still interested in understanding what is known about the potential effects on fish passage associated with Kelsey Re-running. Are there any data available that can inform us about the current passage of fish at the Kelsey Generating Station, and what changes if any may be predicted in future? Please clarify whether there has been any study of this question.</p> <p>Please clarify whether it is the general conclusion of the Proponent that the local effects of hydroelectric facilities upstream are not relevant to the cumulative effects assessment for species that can move outside of the Keeyask regional study area.</p>	CEC Rd 2 PCN-0009	PCN-0009

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PCN	R-EIS Guidelines	6.4 Effects and Mitigation Aquatic Environment; TAC Public Rd 2 Aboriginal and/or Public Comments – 0003a	N/A	Aquatic Environment	<p>The results of the stocking programs described in the response to a previous request for information on sturgeon stocking programs suggests very preliminary, and mostly anecdotal results of efforts to stock sturgeon in other parts of the Nelson River, and in other river systems. Testing of artificial spawning shoals has had mixed results and is still in the early stages. Current initiatives are promising and should certainly be pursued in areas of the river system where stocks are severely depleted due to habitat loss.</p> <p>However, the environmental assessment suggests that a residual effect of the Project will be that stocking will increase the number of sturgeon in the reach of the Nelson River between the Kelsey Generating Station and the Kettle Generating Station.</p> <p>It concludes that: "During the operation period, no long-term adverse effects to lake sturgeon numbers in the area directly affected by the Project are expected due to mitigation measures that provide habitat for all life history stages both above and below the generating station, and an extensive stocking program."</p>	<p>1. Please clarify whether this conclusion refers primarily to the numbers of sturgeon that may be found in this reach of the river at any one time, regardless of their age or reproductive capacity. In other words, if an area is stocked regularly with several thousand hatchery raised fingerlings or age 1 individuals, the numbers would be high for a time whether or not these fish survived longer-term.</p> <p>2. Discuss further whether these conclusions as expressed in the EIS are warranted when the evidence for success of stocking initiatives is acknowledged to be very limited.</p> <p>3. Clarify whether this conclusion is warranted given the acknowledged uncertainties surrounding the access and eventual use of future habitats by sturgeon, including proposed artificial shoals.</p> <p>4. Explain whether there is sufficient evidence to conclude that the longer-term sustainability of existing reproducing populations of lake sturgeon will not be affected by this Project.</p>	PCN-0003	<p>The Proponents's response to our initial question regarding the geographical scope of the cumulative effects assessment states that: "The region relevant to the assessment of effects of the Keeyask Project's biophysical environment is the Lower Nelson River downstream of Kelsey G.S., and, accordingly, this is the regional area focused on for the Existing Environment described in Section 6.2 of the Response to EIS Guidelines." One review of sturgeon migration patterns suggested that a barrier-free 250–300 km combined river and lake range may be the minimum distance necessary to support self-sustaining populations of lake sturgeon, and that migrations of free-ranging populations could extend to 750–1000 km. Reference Auer, N.A. 1996. Importance of habitat and migration to sturgeons with emphasis on lake sturgeon. Can. J. Fish. Aquat. Sci. 53(Suppl. 1): 152–160 (1996). Given the relatively limited data on sturgeon movement within the Nelson River, please comment further on whether the ability of sturgeon to pass existing dams and impoundments on the Nelson River up and down stream should not be considered relevant to the cumulative effects assessment of the Keeyask Project. Please clarify whether it is the conclusion of the Proponent that fragmentation of the Nelson River due to dams and flow regulation up and downstream of the Keeyask reaches is not relevant to the cumulative effects assessment of aquatic habitat disturbance on the potential for the reestablishment of self-sustaining populations of lake sturgeon.</p>	CEC Rd 2 PCN-0010	PCN-0010
								<p>We appreciate your interpretation of the data on sturgeon stocking programs to date, however, we maintain that the results of the sturgeon stocking programs in the Nelson River to date are preliminary and that a minimum of 15 to 20 years is required to develop a comprehensive assessment that is capable of providing adequate evidence of success of stocking in any particular water body.</p> <p>Pimicikamak members have expressed concerns about the long-term effectiveness of sturgeon stocking programs in the upper reaches of the Nelson River, and the ability of sturgeon populations throughout the Nelson River system to recover and become self-sustaining given the multiple dams and impoundments.</p> <p>Some description of the challenges with sturgeon stocking is provided in the Keeyask EIS. In order to better understand the challenges faced with sturgeon stocking programs, please provide an account or references to reports detailing any problematic issues faced specifically with the upper Nelson River stocking program that may be relevant to the program being proposed for the lower Nelson River.</p>	CEC Rd 2 PCN-0011	PCN-0011
								<p>Sturgeon stocking programs have been reviewed by others. For example: Smith, A. L. 2009. Lake sturgeon (<i>Acipenser fulvescens</i>) stocking in North America. Fish and Wildlife Branch. Ontario Ministry of Natural Resources. Peterborough, Ontario. 17 p + appendices. The author of this publication concluded that: "Lake sturgeon stocking has occurred for over 20 years in some North American jurisdictions. Wisconsin and Michigan have the most advanced stocking programs and management experience. Overall, effective stocking strategies for lake sturgeon are limited due to the life history characteristics of slow maturity and long life expectancy. Stocking as a conservation strategy may be an essential tool required to rehabilitate selected lake sturgeon populations. A stocking strategy has the potential to have negative impacts on wild populations and should only be applied where a strong biological rationale exists and where other strategies have been deemed unsuitable for achieving management objectives." The Keeyask EIS does provide some discussion of the challenges faced in obtaining adequate gametes given the current low levels of natural brood stock. Can the Proponent comment further on whether the stocking strategy proposed following the construction of Keeyask has the potential to negatively affect remaining wild populations in those reaches of the Nelson River? It may be self-evident given the extensive stocking program recommended, however, please clarify whether the proposed habitat recreation work in the Keeyask reaches or other reaches of the Nelson River is considered to be inadequate to support self-sustaining populations of wild sturgeon in the future in the absence of artificial stocking.</p>	CEC Rd 2 PCN-0012	PCN-0012
								<p>Manitoba Hydro's Lake Sturgeon Stewardship & Enhancement Program (2012) description states: "Augmentation and/or manipulation of flow could mitigate some of the changes in habitat (such as decreased benthic production) that may result from fluctuations in water levels and flows downstream of hydroelectric peaking facilities. However, manipulating or augmenting flow at one facility may require alterations in flow at other facilities and is limited by water power licenses." (p.13-14) Given that the application for a final water power licence for the CRD is currently being reviewed and the licence for LWR will soon be reviewed, has there been any study to consider alterations in flow patterns throughout the Nelson River for the benefit of sturgeon? Specifically, has there been any consideration to alter flow patterns at Jenpeg or Kelsey for the benefit of the downstream aquatic environment? This may be relevant to Keeyask if upstream flows were altered significantly in future.</p>	CEC Rd 2 PCN-0013	PCN-0013
								<p>Manitoba Hydro's Lake Sturgeon Stewardship & Enhancement Program (2012) mentions the research into sturgeon culture at the Silas Ross Memorial Sturgeon Rearing Facility; the sturgeon stocking in the upper Nelson River; the spawning studies on Playgreen Lake 1995; and movement studies on Sipiwesk Lake to Kelsey GS. Please provide the location of any reports or study plans for these studies if they are referenced in the Keeyask EIS (I probably missed this), or available elsewhere. This is relevant to the Keeyask EIS in furthering understanding of the state of knowledge regarding mitigation measures in the Nelson River, and historical change in the Nelson River to contribute to cumulative effects assessment.</p>	CEC Rd 2 PCN-0014	PCN-0014

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Peguis First Nation										
PFN	PE SV	2.1 Climate Change reference to IPCC 2001; 2.2.1.2 Future Climate Change Scenarios	N/A	Physical Environment		The references for both the Climate Change and Climate Change future scenarios are out of date. Climate science and modeling has advanced significantly since 2007 (the date of the IPCC's 4th assessment report). The earth's GHG emissions have already surpassed the "worst case" emissions scenario outlined in the 4th assessment report. This out-dated science is a major shortcoming of the assessment of the sensitivity to climate impacts. 1) Provide updated climate modeling, include IPCC worst-case data.	PFN-0007	The proponent states that the 4th Assessment Report (coupled model intercomparison, CMIP3) is sufficient. This modeling is based on 2005/6 data and is a collection and summary of a selection of GHG emissions scenarios. Since even the most extreme emissions scenario from the CMIP3 (the A2 scenario) has already been exceeded, this is no longer a reliable indication of future climate conditions. 1) Explicitly, which of the emissions scenarios are you basing your analysis on and explain why this is a valid indication of future climate conditions? 2) Does Manitoba Hydro intend to update its climate changes modeling? 3) Would Manitoba Hydro indicate if it used the A2 scenario in CMIP3?	CEC Rd 2 PFN-0048	PFN-0048
PFN	R-EIS Guidelines	5.3.1- Assessment Framework Steps	N/A	Physical Environment	Study areas for each VEC's are variable and the reason given is to ensure that effects described as a percentage of the area appear small.	1) Which methods and metrics did Manitoba Hydro consider before using the study area per VEC approach in the EIS? 2) Why are affected areas (VECs) not calculated as part of the LSA and RSA?	PFN-0009	Question Misinterpreted IR: This wasn't said as the rationale in the EIS. There were rationale provided, however these conveniently all ensure that the percentages remain small. "The study areas selected are large enough to capture the effects of the Project, but not so large as to mask the effects of the Project (by making the effects of the Project as a percent of the area appear unreasonably small)." If the proponent considers the data collected for some VECs unreasonably small, then why didn't KHLP re-evaluate their approach to VECs?	CEC Rd 2 PFN-0049	PFN-0049
PFN	R-EIS Guidelines	6.0 Environmental Effects Assessment	Table 6-6	Terrestrial Environment	Summarized in relevant sections (of chapter 6) and in detail in the TE SV all of the hydrological systems as far as zone 6 and beyond are physically connected.	1) Did Manitoba Hydro test different methods to determine LSAs and RSAs? 2) Were these LSA and RSA identified specifically so thresholds for change in habitat would not be exceeded? 3) Will Manitoba Hydro provide a table for all VEC's showing total area lost, altered and disturbed by construction, operation including residual effects and cumulative effects across all 6 study zones (or at the very least for both LSA and RSA?)	PFN-0010	Why is there no quantified pre-development baseline provided?	CEC Rd 2 PFN-0050a	PFN-0050a
								How is it possible to avoid a true assessment of cumulative effects (eg. which include other Hydro projects and infrastructure) and still create the appearance of no significant cumulative effects?	CEC Rd 2 PFN-0050b	PFN-0050b
								The proponent draws a box around the ecosystems present in their RSA and suggests that those ecosystems outside of that box aren't relevant. 1) Where is the data to support the Proponent's statement that Keeyask will not affect the ecosystem outside of the study area?	CEC Rd 2 PFN-0050c	PFN-0050c
								This assessment uses ecosystems characteristics that ignore any potential effects from existing and proposed projects, rather than taking into account existing and proposed projects to assess any potential effects on ecosystems. They are not looking at cumulative effects through the lens of Keeyask, rather than looking at Keeyask through the lens of cumulative effects. Why does KHLP deem it unnecessary to account for potential effects that maybe be caused by current and proposed Hydro projects? (In light of the CEC findings in their Wuskwatim report.)	CEC Rd 2 PFN-0050d	PFN-0050d
PFN	R-EIS Guidelines	6.3.12 Sensitivity of Project Effects to Climate Change	6-227	Physical Environment	The examination of the sensitivity to climate change focused on the operation phase as the construction period will take place in the near term and climate change is a longer-term phenomenon. The EIS references given are dated 2003 and 2007.	1) Why did Manitoba hydro ignore climate change scenarios and models available since 2007? 2) Did Manitoba Hydro compare recent climate science to 2003, 2007 references and choose older climate science?	PFN-0011	The CEAA remains more out of date than the IPCC 4th assessment report. So much has happened in the field of climate science in the last 10 years, this reference should no longer be relied upon for upholding best practices. Verify that KHLP is using the most recent climate change and scenarios data available.	CEC Rd 2 PFN-0051	PFN-0051
PFN	R-EIS Guidelines	6.3.12 Sensitivity of Project Effects to Climate Change	6-227	Physical Environment	The examination of the sensitivity to climate change focused on the operation phase as the construction period will take place in the near term and climate change is a longer-term phenomenon. The EIS references given are dated 2003 and 2007.	1) Which IPCC 2007 model or scenario did Manitoba hydro use for the EIS? 2) What System does Manitoba Hydro use to update its engineers managers and scientists regarding climate change?	PFN-0012	"Between the years 2000-2009, growth in CO2 emissions from fossil fuel burning was, on average, 3% per year, which exceeds the growth estimated by 34-35 of the 40 SRES scenarios. Human-caused greenhouse gas emissions set a record in 2010, a 6% jump on 2009 emissions, exceeding even the "worst case" scenario," cited in the IPCC Fourth Assessment Report. Explain why GHG emissions scenarios A1B and A2 do not reflect the current trajectory of global greenhouse gas emissions.	CEC Rd 2 PFN-0052	PFN-0052
PFN	R-EIS Guidelines	Section 6.9 – Effects of the Environment on the Project	N/A	Physical Environment	The Project has been designed to safely pass the probable maximum flood (PMF).	1) How many times have Manitoba Hydro reservoir water levels exceeded PMF levels? 2) How would climate change affect water levels for a 1:10,00 flood event for Keeyask? 3) Has Manitoba Hydro run climate change models specific to worst-case scenarios for both floods and droughts? 4) Do the conclusions in the EIS re: probable maximum flood correlate with recent climate change models—worst case scenarios?	PFN-0014	The proponent states in their IR response: "The estimated PMF for the Keeyask Project is nearly double the highest recorded daily average flow on record. As a result, reservoir water levels would not be expected to exceed estimated PMF levels." In the recent rainstorm in Toronto: "Environment Canada said some parts of the GTA had been drenched with more than 100 millimetres of rain, trouncing the previous one-day rainfall record of 29.2 mm in 2008 for Toronto and even beating the 74.4 mm monthly average for July." [Quote from Globe and Mail]. With the statement that has been made, does the proponent still think that they should not re-evaluate the PMF suggested in the EIS? Explain your reasoning.	CEC Rd 2 PFN-0053	PFN-0053
PFN	TE SV	1.3.4 Valued Environmental Components and Supporting Topics	1-13	Terrestrial Environment	The proponent states that those VEC's and STs selected were those that could potentially experience substantial project effects yet the EIS Chapter 6 says all significant effects to VECs and Supporting Topics were ultimately described as being non-significant.	1) How did Manitoba Hydro decide whether a terrestrial concern was a ST or a VEC? 2) What is the technical and scientific basis for these determinations of non-significant effects?	PFN-0015	Provide the scientific basis behind The Response to the EIS Guidelines, Section 5.5 Approach to Determination of Regulatory Significance?	CEC Rd 2 PFN-0054	PFN-0054
PFN	R-EIS Guidelines	6.5 Terrestrial Environment	N/A	Terrestrial Environment		The EIS indicates that effects of fragmentation and habitat losses are insignificant due to their being other habitat in the region. Significant, long term amphibious habitat losses (27%), within RSA is identified, yet it is stated that there are a lot of amphibians in the RSA since the project effects area represents small portion of regional study area. 1) What will Manitoba Hydro do to mitigate loss of 27% amphibian habitat? 2) The reference to amphibians in the RSA: did Manitoba Hydro use recent scientific data regarding the rapid decline of amphibians in North America?	PFN-0016	This IR response is an example of the proponent using the Zones to ensure that the percentage changes are small. Eg percent change in zone 3 = 27%, percent change in zone 4 = 3%, so they are using zone 4. How are off system marshes a proper way of mitigating the destruction of an untouched ecosystem? Explain your reasoning.	CEC Rd 2 PFN-0055a	PFN-0055
								Amphibian populations worldwide have been in decline due to, among other things, habitat loss, pollution and climate change. Between a third and half of all amphibian species are currently threatened with extinction. Being an amphibian species, and given the dire context of amphibians globally, why is the Northern Leopard Frog not considered a Valued Ecosystem Component?	CEC Rd 2 PFN-0055b	
PFN	N/A	EIS Supplemental Filing 1 - 2012 Keeyask Traditional	3	Physical Environment	In deference to Aboriginal and Treaty rights for people of all ages to have access to the land, changes in water level make it difficult to land a boat and access land along altered shorelines. Shoreline erosion being predicted to carry on		PFN-0001a	Will "ATK monitoring involve the development and implementation of annual monitoring programs.....related community concerns about potential effects" or not? Please explain. How will the ATK contents and results from monitoring plans be provided to regulators in order to assess the project and its licensing conditions?	CEC Rd 2 PFN-0056	PFN-0056
								Please answer the original IR question – with respect to areas above proposed new water levels during each phase of the project.		

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		Plants Workshop Summary			for many years confirms he road for access.			How will the Waterways Management Program information for the pre flooding and post flooding period be: - provided to affected communities - made public and be incorporated into ongoing monitoring and environmental management programming for Keeyask? Was the Keeyask Waterways Management Program information filed with the EIS for Keeyask? If not, why not, and will Manitoba Hydro file it now?	CEC Rd 2 PFN-0057	PFN-0057
PFN	N/A	EIS Supplemental Filing 1 - 2012 Keeyask Traditional Plants Workshop Summary	3	Terrestrial Environment	Trees and plants have already been destroyed by hydro developments. The EIS states people will have to go further to access intact (uncontaminated) medicinal plant areas.	Answer the following questions: 1) Have suitable alternative plant gathering areas been located by traditional knowledge keepers? Provide documents and/or plans to define "further" in distance and time. 2) Has Hydro made a formal commitment to provide travel services, available on demand, as the need to access medicinal plants is triggered by illness and accidental injury? What limitations will interfere or prohibit travel arrangements? 3) Are provision in place for access coordinated around plant life cycles and harvest times?	PFN-0002	How will the Aboriginal rights to gather, hunt, track, and use crown lands and waters of those Aboriginal citizens who are not members of the KCNs be accommodated? Do the AEA offsetting programs negotiated include accommodating the Aboriginal rights of other First Nations within the RSA, LSA, and with respect to the reservoir, and offsetting programs? Do the various Agreements which the KCNs have negotiated with Manitoba Hydro also acknowledge the rights of Aboriginal persons and communities who are not KCNs?	CEC Rd 2 PFN-0058	PFN-0058
PFN	N/A	EIS Supplemental Filing 1 - 2012 Keeyask Traditional Plants Workshop Summary	5	Terrestrial Environment	Medicinal plants are gathered for personal use from areas identified by families who share that information within the bounds of personal relationships (plant location is not generally shared or mapped, YFFN was determined not to share mapping information at the 2012 workshop), and numerous areas of traditional harvest will be destroyed and/or degraded.	Answer the following questions: 1) Are people from TCN, WLCN, FLCN and YFFN who harvest medicinal plants afforded access to all newly identified medicinal plant locations? 2) Will communities share harvesting sites and coordinate within and between each other to protect and manage these sites? 3) How has Hydro documented and communicated their commitment to finding a solution regarding medicinal plants that is amenable to all parties?	PFN-0003	These questions were not answered in Round 1. Cross reference to 002 not relevant as answers are not provided. Please provide answers. Which KCN will have access to newly identified medicinal plant locations? How is a newly identified medicinal plant location confirmed by knowledgeable First Nation land users? How are the Aboriginal rights of non KCN members going to be supported and accommodated with respect to gathering medicinal plants?	CEC Rd 2 PFN-0059	PFN-0059
PFN	N/A	EIS Supplemental Filing 1 - 2012 Keeyask Traditional Plants Workshop Summary	4	Terrestrial Environment	Borrow pits from Hydro development (past and present) have been raised as a concern in all three medicinal plant workshops, as they have been left in a degraded state and lay bare for opportunistic grass and weeds—workshop participants have proposed these areas be restored in a balanced way with useful plants, including berries. Doing this would alleviate scars that remain visible on the landscape and could serve as part of an field-based educational science program, an expressed goal for communities.	Answer the following questions: 1) In number and surface area, what amount of land has been degraded by borrow pits within the project area to date? And, amount planned over the next 10 years? 2) What percentage of that surface area has been restored to date in keeping with ATK and practices, repeatedly shared in workshops since the first in 2009? 3) Is there a commitment in place to restore borrow pits in culturally appropriate ways, going forward? What are the specific targets in scale and time. 4) Has Hydro dedicated funding specifically for classroom and field-based science curriculum with regard to medicinal plant knowledge and plant conservation?	PFN-0004	Provide an estimate of the size of the quarry and rock access sites in the river and lake identified in the EIS. Provide Manitoba Hydro and KCN standards to rehabilitate borrow pits in a 'culturally appropriate way.' What does Manitoba Hydro mean 'could include restoration in culturally appropriate ways' ? What vegetation will be used to rehabilitate borrow pits in a culturally appropriate way ? Answer specifically with respect to the Main Camp Decommissioning contracts. Will the Keeyask Centre be in place during construction and will programming there as per your answer to the IR be in place during construction? Is the Keeyask Centre operating now? What does the Keeyask Generation project or other projects fund or provide at this Centre?	CEC Rd 2 PFN-0060a CEC Rd 2 PFN-0060b CEC Rd 2 PFN-0060c	PFN-0060
PFN	PE SV	2B-6 Greenhouse Gas Reporting and Commitments	N/A	Physical Environment	The EIS states it is feasible to propose site-specific adaptation strategies that deal with potential impacts of climate change on the local environment of Keeyask.	1) What are the site-specific adaptation strategies to deal with; a. Medicinal plant locations? b. Calving and wintering locations for caribou? c. Migration of habitat types due to climate change? d. Change in habitat locations for endangered species? e. Additional listed and endangered species?	PFN-0008	Will Manitoba Hydro have site specific climate adaptation strategies in place for the Keeyask Generation Station project? This question pertains to roads, dikes, offices, housing, cement operation, all vehicles, and all stages of construction and operation? Manitoba Hydro says it "will continue to advance the state of knowledge of climate change impacts at the system wide scale....." Is that knowledge applied in the Keeyask EIS and filings, and will the system wide knowledge of Manitoba Hydro re climate change impacts be made available to Keeyask participants ?	CEC Rd 2 PFN-0061a CEC Rd 2 PFN-0061b	PFN-0061
PFN	R-EIS Guidelines	5.3.1- Assessment Framework Steps	N/A	Physical Environment	Study areas for each VEC's are variable and the reason given is to ensure that effects described as a percentage of the area appear small.	1) Which methods and metrics did Manitoba Hydro consider before using the study area per VEC approach in the EIS? 2) Why are affected areas (VECs) not calculated as part of the LSA and RSA?	PFN-0009	Based on the IR round 1 answer advise the participants and the CEC where the EIS Guidelines and regulatory framework direct the proponent not to use an ecosystem framework to identify environmental effects for the combined project area and for combined habitat and location for VECs.	CEC Rd 2 PFN-0062	PFN-0062
PFN	R-EIS Guidelines	6.3.12 Sensitivity of Project Effects to Climate Change	6-227	Physical Environment	The examination of the sensitivity to climate change focused on the operation phase as the construction period will take place in the near term and climate change is a longer-term phenomenon. The EIS references given are dated 2003 and 2007.	1) Which IPCC 2007 model or scenario did Manitoba hydro use for the EIS? 2) What System does Manitoba Hydro use to update its engineers managers and scientists regarding climate change?	PFN-0012	<ul style="list-style-type: none"> How will Manitoba Hydro keep its climate change scenario and modeling for Keeyask up to date during the construction phase - and what is the plan to be up to date regarding climate change prior to operation of Keeyask Generation Station ? What are Manitoba Hydro's ' established climate change strategies that shape the organization's to climate change' ? How did the department in Manitoba Hydro studying climate change 'update decision makers' regarding the Keeyask project ? What are Manitoba Hydro's climate change impact studies ? Are these studies available to Keeyask participants ? Provide a listing of these studies. Provide a listing of any climate change studies Ouranos undertook for Manitoba Hydro. You have referenced Manitoba Hydro's Climate Change Strategies in answering IR 0012. Were any of the results of Manitoba Hydro's Research Management Board's climate change projects applied to planning for Keeyask ? Will any of the results of these various research, and statistical projects be applied to construction or operations for Keeyask ? If the intention is for the outcomes from these projects to be applied to the construction or operation phases of Keeyask please provide full information about these climate change projects. Please provide Keeyask participants and the CEC with the details of the climate change research, statistical and downscaling projects currently underway through the Manitoba Hydro Research Management Board – as these are relevant for the future operations of Keeyask, and connected projects. (Referenced in the EIS and in IR 0012 response.) Given these climate change programs and investments with Ouranos and others as per PE SV Appendix 2 B are paid for with public funds, and revenues of a public utility please advise the reporting mechanism regarding these climate change programs, and research projects. 	CEC Rd 2 PFN-0063	PFN-0063

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PFN	R-EIS Guidelines	6.5 Terrestrial Environment	N/A	Terrestrial Environment		The EIS indicates that effects of fragmentation and habitat losses are insignificant due to their being other habitat in the region. Significant, long term amphibious habitat losses (27%), within RSA is identified, yet it is stated that there are a lot of amphibians in the RSA since the project effects area represents small portion of regional study area. 1) What will Manitoba Hydro do to mitigate loss of 27% amphibian habitat? 2) The reference to amphibians in the RSA: did Manitoba Hydro use recent scientific data regarding the rapid decline of amphibians in North America?	PFN-0016	Is Manitoba Hydro suggesting that the loss of 27 % of the amphibians in Zone 4 from Keeyask project effects is not a significant or relevant effect of the project ? Is Manitoba Hydro suggesting that all amphibians are able to recover their population and habitat by moving into decommissioned burrow pits ? InWhich zone are these de commissioned burrow pits which will provide habitat for recovering amphibian populations located ? Is Manitoba Hydro suggesting that 'rapid declines in North America amphibian populations occurred only during the 1970's? Did Manitoba Hydro use the decline of amphibians in Manitoba in the period between 1970 and 2005 for the basis of this area of the EIS ?	CEC Rd 2 PFN-0064a CEC Rd 2 PFN-0064b	PFN-0064
PFN	R-EIS Guidelines	6.5 Terrestrial Environment	N/A	Terrestrial Environment		The range of natural variability appears to be used as a reassurance that significant effects whenever and wherever found, are natural. 1) How did Manitoba Hydro determined the natural range of variability, and why are they sure that changes to VEC's and supporting topics don't vary significantly? 2) Why did Manitoba hydro use different indicators for different VEC's without a technical explanation? 3) Provide a table for all VECs 4) Would Manitoba Hydro provide clear rationale for determination of percent range or other predicted changes being insignificant or within natural range of variability?	PFN-0018	Not answered. Please provide answer to the question. Does Manitoba Hydro use any other source than a twenty year old CCFM set of forest criteria and indicators to provide a basis for answer to this question ? Why did Manitoba Hydro not cite or use the 2006 and 2008 updates to these CCFM indicators and criteria ?	CEC Rd 2 PFN-0065	PFN-0065
PFN	R-EIS Guidelines	5.5 Approach to Determination of Regulatory Significance	N/A	Response to EIS Guidelines		Please answer the following questions: 1) What is Manitoba Hydro's definition of natural variability? 2) How is sensitivity to disturbance assessed? Methodology? 3) How is VEC capacity to change assessed? 4) Why were geese and ducks (pg. 630, 633) not evaluated further despite text describing adverse, long term impacts to their habitat?	PFN-0020	Question # 1 The reference in answer to this IR is provided as Terrestrial Environment Supporting Volume Section 1.4.3 In the IR response Manitoba Hydro provides this reference which a list of Effects Benchmarks and says 'the types of benchmarks used were :"' (see list) In the Reference within the volume Section 1.4.3 Manitoba Hydro indicates that there is a " Lack of generally accepted scientific standards.....benchmarks used to assess Project effects varied depending onone or more of the following:" (see same list) Explain the difference in the above statements, and explain then which of the items in the list were used to arrive at effects assessment for each VEC etc for Keeyask. Provide clear statements as to which specific example of the elements in this list were used for each VEC assessment. In particular provide a listing of the detailed sources for each of the elements in this list. Original question was NOT answered. Manitoba Hydro definition of natural variability, which is in the list, should be provided.	CEC Rd 2 PFN-0066a	PFN-0066
								Question # 4 There is no answer to the question regarding geese in this IR. First Nation hunters in other regions of Manitoba utilize the same goose resource in their hunt. Explain how the access and rights to this resource for Aboriginal hunters will be maintained despite the admitted adverse, long term impacts to their habitat?	CEC Rd 2 PFN-0066b	
PFN	AE SV	2.5 Water Quality	N/A	Aquatic Environment	Water bodies act as large natural sinks for sequestering anthropogenic carbon emissions. Carbon enters the aquatic environment in the form of dissolved carbon dioxide (CO2), which then binds to calcium carbonates. Dissolved CO2 increases the acidity of the aquatic environment, which in turn slows calcium carbonate precipitation, thereby decreasing the ability of the water to absorb CO2. Vertical deep mixing is a mechanism that then transports the sequestered carbon to the deeper layers of the water column. Aquatic plants play a significant role absorbing dissolved carbon by converting it to organic material, and mitigating aquatic acidification by converting CO2 to oxygen during photosynthesis. Water bodies play a significant role in the carbon cycles of the earth and in local ecosystems, and must be considered when evaluating the impacts of carbon emissions on the environment (terrestrial and aquatic). Within the EIS materials there is limited discussion on the role water plays in the carbon cycle, and how modification to the aquatic environment, terrestrial activities, effluent discharge and flooding of peatland as a result of the Keeyask Project, will influence carbon emissions.	Please respond to the following questions: 1) How will the Keeyask Project influence the process of vertical mixing and sedimentation within the Keeyask reservoir and Stephens Lake? 2) How will the flooding of peatlands increase the amount of dissolved carbon within the aquatic environment? 3) How will change in flow regime of the Nelson River impact carbon cycles? 4) Did Manitoba Hydro conduct a cumulative carbon cycle analysis for the construction and operation phases of the Keeyask Project, which incorporates both terrestrial and aquatic carbon cycle data and mechanisms?	PFN-0024	Question# 1 was not answered. Provide an answer with respect to Keeyask reservoir, and Stephens Lake (reservoir). Questions # 3 and # 4 A reference is made to Technical Memorandum GN 9.5.5, and 9.5.6 are as being provided on the CD which contained Technical Memoranda. Advise whether there is an accessible table of contents and listing of these both alpha and numeric. Given that the technical reports for the Keeyask EIS have neither an alpha listing by title or authors, and were not included in the EIS in 2012 Manitoba Hydro needs to provide accessible listings of materials it includes in filings on a timely basis. Manitoba Hydro should advise the participants and the CEC why these technical Memoranda were not provided with the EIS.	CEC Rd 2 PFN-0067a CEC Rd 2 PFN-0067b	PFN-0067
PFN	AE SV	1.2.2.4 Selection of VECs	Table 1-1	Aquatic Environment	VECs are selected in order to act as indicators of ecosystem health. Aquatic VECs selected include; water quality, walleye, northern pike, lake sturgeon and lake whitefish. All other potential VECs were not selected on the basis that they were not deemed important for resource use by local people. The fish species selected as VECs are higher up in the foodchain, and therefore will take longer to respond to subtle changes in the aquatic environment compared to other ecosystem components. Furthermore, quantifying simply the number of fish in a given area is not a measure of ecosystem or VEC health. Specific parameters of the VEC aside from mercury concentrations must be assessed; reproductive capability, size, general health, etc, need to be measured and the culmination of those measured results be compared in a matrix to determine overall VEC health.	Please answer the following questions: 1) Explain the rationale behind selecting only the ecosystem components that are regarded as important for resource as the aquatic VECs? a. How does this rationale support the purpose of selecting VECs to monitor and measure ecosystem health? 2) Are the VECs selected strong/appropriate indicators of ecosystem health? Explain. 3) What parameters of the VECs are being measured to determine the health and vitality of the VEC? a. Provide the data in matrix format off what particular biological parameters of each VEC are being measured and how those parameters are being quantified for comparison to baseline data?	PFN-0027	Question # 3 There is a reference to ' post project monitoring' in the IR response. What does this mean ? It appears that Manitoba Hydro and its partners assume that th same ' parameters will be measured for each VEC' post project Please inform participants and the CEC whether monitoring will continue throughout the construction phase, with analysis of the results and an indication of how data sets and results of technical work will be updated for the operation phase of Keeyask. In particular, given the data and standards used for VECs, and used in the various technical reports are often as much as 10 – 24 years out of date Manitoba Hydro should advise all parties how they will bring the basis for operation of Keeyask with respect to VECs, environmental effects, and criteria and indicators use up to date for the operation phase.	CEC Rd 2 PFN-0068	PFN-0068
PFN	R-EIS Guidelines	6.2.3.4.8 Mercury in Wildlife	N/A	Terrestrial Environment		1) What are the results from the 'historic records for mercury concentration in indicator species' near the RSA ? 2) Have any studies regarding mercury concentration in mink, or otter in the RSA, or LSA prior to filing the Keeyask EIS? 3) Have any studies regarding mercury concentration in these and other mammals been done sine those cited in this section of the EIS?	PFN-0029	Manitoba Hydro has indicated that monitoring and testing for mercury in species is ongoing. How will the ongoing monitoring and testing be reported, and used in decisions for the operation of the Keeyask project? Did Manitoba Hydro use the Manitoba Government standards for consumption of fish (assumed mercury levels) in Stephens Lake, and Split Lake as a basis for their self-assessment in the EIS?	CEC Rd 2 PFN-0069a CEC Rd 2 PFN-0069b	PFN-0069

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PFN	R-EIS Guidelines	6.2.3.2.6 Surface Water and Ice Regime	N/A	Physical Environment		The EIS indicates on page 6 – 29 that " river flows to the LSA originate from the Upper Nelson River, the Burntwood River and the local inflow. 1) Will Manitoba Hydro made available statistics or data for these rivers flows, over time? This request is in an IR based on the preference of the Keeyask project managers and is to be used in the Land and Water Changes analysis, funded by CEC.	PFN-0030	Manitoba Hydro has provided the address for a public site which provides statistics for outflow data. Please confirm that this web site provides outflow data for each structure Manitoba Hydro operates. Our offices have identified the water elevation data for each reservoir only to date.	CEC Rd 2 PFN-0070	PFN-0070
PFN	PD SV	4.1 Overall System Effects	N/A	Physical Environment	The EIS materials state that the Churchill River Diversion (CRD) and the Lake Winnipeg Regulation (LWR) determine the seasonal flow patterns in the Nelson and Burntwood rivers, and consequently the flows available for all the generation stations along those rivers, including Keeyask.	Answer to the following questions: 1) Will there be no change in water levels to the Keeyask reservoir arising from the LWR and/or CRD. 2) Under special operating conditions or emergencies, can the CRD or LWR be used to augment river flows to support power generation for facilities along the Nelson River? 3) Confirm that there will be no increase to LWR water levels in order to support seasonal flows for Wuskwatim, Keeyask and Conawapa.	PFN-0032	There is no reference or content in the answer as to which Lake Winnipeg Regulation permit is the basis for in the answer. Please confirm that the answer to IR 0032 is in relation to the current Lake Winnipeg Regulation permit, and water range allowed, citing the year and number of the permit.	CEC Rd 2 PFN-0071	PFN-0071
PFN	R-EIS Guidelines	7.5.2 Terrestrial Environment	N/A	Terrestrial Environment		The EIS says " Terrestrial environment ...substantially altered...continued to experience those effects today." In contrast, the Summary of Cumulative Effects of Project with Past and Current Activities (7.5.2.2), the proponent suggests that all of these previous (and significant) effects are no longer significant. 1) If all of these impacts of past projects are so significant, with long-term effects, how could the proponent be so sure that impacts of the Keeyask project will not be significant? How do you explain this? 2) What is the basis for this assumption? 3) Did the CN Partners agree that environmental effects from Keeyask are insignificant? 4) Was a list of effects of past and current projects and activities that have had significant, long-term effect on the terrestrial environment used for cumulative effects assessment?	PFN-0021	1) Two of these benchmarks ("relative degree of change from relatively natural conditions") are both weak (relative change from a relative condition) and "conditions in areas relatively unaffected by human development" are both weak. It is unlikely that the proponent is really comparing to a natural condition, since the entire hydrological system is no longer in a natural condition, and hasn't been for some time. Neither would lead to an assessment of change solely due to human intervention. QUESTION: What does the proponent consider to be a natural condition? The way this matrix is designed it makes it very unlikely that anything will advance to a Step 2 assessment. Where a Step 2 analysis was conducted, effects became acceptable because the proponent is able to choose from the following list of rationale at their convenience, which negate any adverse impacts: there won't be an adverse effect on aquatic biota (united /unreferenced assumption in the case of TSS); adverse effects offset by artificial lake stocking in the case of lake; cumulative area losses for all priority habitat types are predicted to remain below 10%; "significant" wetlands aren't affected (I all wetlands are regional or locally significant); no endangered or threatened species are known to occur in affected areas, or if there is a threatened species such as the Olive-sided flycatcher- it is found not significant because there is suitable habitat throughout the region (the question of why this species is threatened if changes to it's habitat are not significant). In short, any impact significant enough for a Step 2 assessment is then found to have non-significant effects based on the proponent's choosing. 4) QUESTION: Cite the source(s) of the methodology described in section 5-5, and the source of Figure 5-1, pg 5-12.	CEC Rd 2 PFN-0072a CEC Rd 2 PFN-0072b	PFN-0072
PFN	R-EIS Guidelines	7.3.2 Summary of Project Physical Effects	N/A	Response to EIS Guidelines		Sections in chapter 7 outline changes from a current condition (eg. % habitat change) due to the project, rather than from a historical baseline or pre-development condition across all developments in the hydrological region. Whereas Hegman et al (1999) refers to the need to assess whether an individual project is incrementally responsible for adversely affecting a VEC beyond an acceptable point. 1) How is the long term flooding expected taken into account? 2) Did Manitoba Hydro take into account any historic baseline for % habitat change data? 3) Did Manitoba Hydro include habitat change measurements from other generation station projects to establish methods to predict habitat change % for Keeyask?	PFN-0022	1) The proponent is measuring change from current, not a historical baseline 2) "The proponent refers to CAC-0012, which states: Ultimately, the focus of the assessment was on the future rather than on the past, i.e., on examining the vulnerability of each VEC today and in the future without the Project (due to whatever factors might affect this vulnerability), in order to help in identifying the extent to which incremental effects on a VEC from additional changes caused by the Project could potentially result in a cumulative significant adverse effect on the VEC." "For historical conditions, [the temporal scope was determined separately for each key topic] as far into the past as needed to describe historical conditions and trends, subject to the availability of relevant historical information" (emphasis added)." The proponent then refers to key historical habitat data incorporated into the study, but this was only performed within the Regional Study Area and only considers historical changes such as those from settlements, roads and transmissions lines... not from flooding. They conclude: "In summary, in accordance with good practice for a project-focused EIS carried out to meet regulatory environmental assessment requirements, available and relevant information on pre-disturbance conditions was considered in the significance assessments of the Project's residual effects for all VECs identified for the Project's environmental assessment." QUESTION: Please state the total area of habitat loss to date due to settlements, roads and transmission lines in the combined RSAs for the generation stations on the Nelson River, and in and assumed in the Keeyask Regional Study Area. Also, please state the amount of land area that has been flooded as a result of hydroelectric development in Manitoba to date, as this was omitted from the historical analysis described in CAC-0012 and CEC-0020.	CEC Rd 2 PFN-0073	PFN-0073
PFN	PE SV	2.1 Climate Change reference to IPCC 2001; 2.2.1.2 Climate Change future scenarios date to 2001	N/A	Physical Environment		The EIS makes an assumption of no change in variability or frequency of weather events compared to present day (pg. 100). "It is contradictory to use climate modeling that assumes no change in variability, yet changes in variability are predicted. This contradicts the IPCC that states, "type, frequency and intensity of extreme storm events are expected to change as earth's climates changes" (pg 111). 1) What does Manitoba Hydro see as the variability of weather and climate in the region, based on IPCC statement above?	PFN-0023	Manitoba Hydro is pointing us to the fact that they use the best available climate modeling for their assessment, yet implicitly acknowledge that it is insufficient (see IR-0011). In these cases, the best that they used is outdated. By using the Delta model, the proponent admits that it has not incorporated the potential for changes in variability or frequency of weather events compared to the present day. At the same time, it acknowledges on page 2-19 of the Physical Environment Supporting Volume that the type, frequency and intensity of extreme events are expected to change as Earth's climate changes. The proponent also acknowledges that the conclusions made in Table 3 of the Technical Memorandum are global or continental scale, not specific to smaller regions such as the Keeyask study area. So, in other words, Manitoba Hydro doesn't have good local data to support the assessment of local impacts. How will Manitoba Hydro update and improve its local and climate change data so that the Keeyask climate change effects assessment is based on models and standards in the 2013 IPCC Assessment ?	CEC Rd 2 PFN-0074	PFN-0074
PFN	AE SV	2.5 Water Quality	Table 2-13 Residual Effects on Water Quality	Aquatic Environment	Residual effects on water quality for Split Lake and Stephens Lake reservoir are predicted to be negligible for the construction and operation phases of the Keeyask project.	Please respond to the following questions: 1) Explain how these conclusions were arrived at? 2) Provide the water quality baseline data for the Split Lake and Stephens Lake. 3) How are the water levels in Stephens Lake predicted to fluctuate in response to the Keeyask Project?	PFN-0035	Explain why Stephens Lake is used as a proxy area. Were other reservoirs or lakes in the Hydro system considered as a possible proxy?	CEC Rd 2 PFN-0075	PFN-0075

Department	Volume / Document	Line Number / Table Number / Figure Number	Page	Topic	Context / Preamble e.g., provide applicable background/rationale for providing the comment	Specific Department Comment / Request for Additional Information:	Round 1 Proponent Response	Round 2 Intervenor Question	Round 2 Response #	original intervenor IR#
PFN	AE SV	2.5.1.3.3 Treated Sewage Effluent	N/A	Aquatic Environment	The EIS materials predict that since sewage effluent will be treated (limit Total phosphorous levels to 1mg/L) and due to high river discharge, there will be limited effects of nutrient loading in the lower Nelson River. Phosphorous is a limiting nutrient for macrophyte and phytoplankton growth. Increases in baseline P levels would inadvertently alter the density of plant and algae in the Stephens Lake reservoir.	Please respond to the following questions: 1) What is the predicted flow rate of treated effluent being released into Stephens Lake per hour, during the construction and operation phases of the project? Explain. 2) Where will the effluent from the Keeyask Project be released? Stephens Lake? 3) Will the phosphorous and nitrogen rich effluent released into Stephens Lake impact growth of blue-green algae and other phytoplankton. 4) Do the predicted phosphorous levels also include contributions from other nutrient rich effluent sources originating from the project; peatland flooding, waste water, concrete batch plant effluent, dewatering etc? 5) Has the impact to nitrogen and phosphorous ratios been investigated? If not, why not?	PFN-0036	Question # 2 Please confirm that effluent that will be released into the Nelson River, as per IR response, will also then travel via the Nelson River through Stephens Lake. Question #2: Provide information as to other waste from Keeyask Generation Station project that will be disposed of in Gull Lake prior to it becoming a reservoir. (Quantity, type, effects,etc.)	CEC Rd 2 PFN-0076a CEC Rd 2 PFN-0076b	PFN-0076
PFN	AE SV	1A.2.1 Structures in Water Construction Scheduling	N/A	Aquatic Environment	The construction of in-water structures will be scheduled to avoid sensitive periods for fish; spawning periods.	Please respond to the following questions: 1) How will the integrity of fish habitat be monitored throughout Keeyask construction and operation phases, and the different seasons? 2) How does the Environmental Protection Program for aquatic habitat make provisions to protect sensitive fish habitat? 3) What are the standards for maintenance and monitoring of sensitive fish habitat?	PFN-0037	Question # 2 Provide the missing content at line 70 and line 77 where Error ! Reference source not found appears in the IR Response. Question # 3 Confirm that there is currently no Aquatic Effects Monitoring Plan for Keeyask Generation Project. Advise participants and the CEC whether this information will be available for discussion and questions during the CEC hearings, or sooner. When will this plan be available for public review as per the regulatory process for DFO and MCWS?	CEC Rd 2 PFN-0077a CEC Rd 2 PFN-0077b	PFN-0077
PFN	TE SV	2.8.4.3 Residual Effects Conclusions (to Wetlands)	N/A	Terrestrial Environment	EIS materials indicate the overall residual effects of the project on wetland function are expected to be adverse, irreversible and continuous in frequency but low in ecological context. However on a global, national and provincial level, wetland impacts are considered nil, as significant amounts of wetlands on that scale are not impacted. Losses to native wetland types is predicted to be less than 10% in the historical area.	Please answer the following questions: 1) Why did Manitoba Hydro compare the loss of wetlands in Manitoba on a global and national scale? Why is that a relevant analysis? 2) What is the current state of wetlands in Manitoba? 3) Did Manitoba Hydro seek to incorporate aspects of peatland conservation outlined within the Manitoba Government Tomorrow Now – Green Plan? 4) For what length of time were the residual effects to wetlands calculated for? 30 years? 5) What model was used to assess for loss of wetlands over time, and did this model incorporate; a. Future Manitoba Hydro projects? b. Climate change? c. Anthropogenic activity?	PFN-0038	Question 4 Based on the intention to gauge and assess effects on wetlands for the 40 years that include the construction and first 30 years of operation, provide details on how effects on wetlands during the construction period will be monitored and mitigated.	CEC Rd 2 PFN-0078	PFN-0078
PFN	TE SV	2.10 Cumulative Effects with Other Projects	N/A	Terrestrial Environment	The cumulative impact of the Keeyask Generation project was assessed in conjunction with future Manitoba Hydro developments; Gillam Redevelopment project, Bipole III transmission line, Keeyask Transmission Project and the Conawapa Generation Project. For all assessments examining combined future project cumulative effects to intactness, ecosystem diversity and wetland function, no cumulative effect was reported. It was not discussed how the conclusions were arrived at, what baseline values or parameters were evaluated to calculate the cumulative impacts.	Answer the following questions; 1) How was it determined that there were no overall net cumulative effects from all projects combined on the terrestrial environment? 2) How were the terrestrial VECs evaluated during this assessment? 3) How will the terrestrial VECs be assessed during construction and operation phases of the Keeyask project? 4) The assessment needs to be repeated, using pre-Manitoba Hydro development data (1970s) as the baseline value. Qualitative and quantitative measures of change need to be established which are comparable/measurable between all project future projects. Finally, Manitoba Hydro will have to provide the results of the assessment, and include a geographic depiction of cumulative impacts over time.	PFN-0042	Question # 3 Question not answered. Answer required still. Questions regarding ongoing monitoring and collection of data to make sure that data and information is still relevant at the time of operation of Keeyask should not be dismissed in answering IRs. Assessment that is theoretical and conducted 10 – 40 years before effects needs to be become living assessment, and updated throughout.	CEC Rd 2 PFN-0079	PFN-0079
PFN	N/A	Project Description Supporting Volume; Terrestrial Environment Supporting Volume	N/A	Terrestrial Environment	The Keeyask Generation EIS LSA and RSA have overlap with Forest Management Units 86, and 76. Manitoba Hydro has included assessment information that include habitat in these FMUs.	1) What data sources regarding the FMUs did Manitoba Hydro use? 2) Did Manitoba Hydro contribute to the Manitoba Forest Resource Inventory due to its technical and scientific studies? 3) Was the FRI data, or forest ecosystems data used in determining the Zones, which in turn are the context for analysis for VECs? 4) This request is in IR form, and includes a request for the data regarding the questions above. This IR is based on the request of the Keeyask Generation project managers.	PFN-0044	Question # 4 Manitoba Hydro has made a mistake, as this IR has nothing to do with MWL IR # 0051. An LCA analysis is not the same as land and water change over time analysis. We request that this IR be answered fully to correct the mistake.	CEC Rd 2 PFN-0080	PFN-0080

ACRONYMS

Submitter Name	Full Name
CAC	Consumers' Association of Canada (Manitoba) Inc.
CEC	Clean Environment Commission
CFLGC	Concerned Fox Lake Grassroots Citizens
KK	Kaweechiwasihk Kay-tay-a-ti-suk
MB Wildlands	Manitoba Wildlands
MMF	Manitoba Métis Federation
PCN	Pimicikamak Okimawin
PFN	Peguis First Nation

1 **REFERENCE: Volume: Response to EIS Guidelines; Section:**
 2 **Executive Summary; Page No.: N/A**

3 **CEC Rd 2 CEC-0091**

4 **ORIGINAL PREAMBLE AND QUESTION (CEC-0026):**

5 A statement is made in the Executive Summary that fish passage will be provided to
 6 maintain connections among fish populations. This does not seem to be accurate. How
 7 will this be accomplished, specifically? Please comment.

8 **FOLLOW-UP QUESTION:**

9 There is a need to consider downstream fish passage facilities in the design stage
 10 including a fish bypass. The discussion on pg 4 last paragraph of the Response indicated
 11 that if "all of DFO's management objectives can be met and ongoing productivity can be
 12 supported without the installation of fish passage facilities, DFO will not require the
 13 installation of these facilities as part of the proposed development". This is different
 14 from the Response on CEC-0031 which states "Due to the technical difficulty and high
 15 cost associated with designing a downstream fish pass system into the station itself, a
 16 downstream bypass within the station will not be considered for this Project" (pg 17-18
 17 last sentence). Our concern is that if a bypass structure and angled screens are not
 18 considered during the planning stage it may too costly to install after the facility is
 19 constructed. Please explain the apparent discrepancy. Disagree with the statement that
 20 angled screens are an experimental approach. In addition to the Menominee River,
 21 angled screen technology is being used in US north-east for a variety of species.

22 **RESPONSE:**

23 As described in CEC Rd 1 CEC-0026, fish passage has been discussed with Fisheries and
 24 Oceans Canada (DFO) and Manitoba Conservation and Water Stewardship (MCWS) over
 25 a period reaching back to 2011. The final position by DFO in this regard was provided in
 26 the attached correspondence (2013 July 10) from Mr. Dale Nicholson (Regional Director,
 27 Ecosystems Management, Central and Arctic Region, Fisheries and Oceans Canada) to
 28 Mr. Ken Adams (President, Keeyask Hydropower Limited Partnership).

29 As per the attached letter, DFO's position is that there is insufficient information at this
 30 time to determine the importance of fish movements to a sustainable fishery. However,
 31 in the absence of evidence to the contrary, DFO's position is that the movement of Lake
 32 Sturgeon, Walleye and Lake Whitefish at the proposed project site should be considered
 33 as important to the lifecycle and ongoing productivity of these fishes¹. The requirement

¹ It should be noted that the Partnership is of the opinion that movements of adult fish are not required for sustainable fish populations, as per the EIS, due to the presence of habitat required

34 for fish passage facilities will be determined by DFO, in consultation with MCWS, based
 35 on the results of monitoring, established fisheries management objectives, and support
 36 for ongoing fisheries productivity. DFO will not require the installation of fish passage
 37 facilities if DFO, in consultation with MCWS, determines that all fish management
 38 objectives can be met and ongoing productivity can be supported without installation of
 39 these facilities.

40 With respect to downstream fish passage, the selected method, as discussed in CEC Rd 1
 41 CEC-0031, would be through the turbines (and spillway, when in operation). If
 42 monitoring reveals that turbine passage is not as successful as predicted, alternative
 43 measures to permit downstream passage, such as catch/trap and transport and a
 44 nature-like bypass along the bank of the Nelson River, will be examined. This is
 45 consistent with the approach to fish passage set out in the 2013 July 10 correspondence
 46 from DFO.

47 The Interogatory suggests that the Project should include provision for a downstream
 48 bypass and angled screens. The Manitoba Hydro document titled "Keeyask Fish Passage
 49 Identification of Design Concepts" (November 29, 2012) referenced in CEC Rd 1 CFLGC-
 50 0022 contains an overview of research conducted by fish passage experts to identify
 51 passage options relevant to the Project. This document was submitted as part of the
 52 Responses to Request for Additional Information from TAC Public Rd 2 and was included
 53 on the CD of technical reports provided with the CEC Rd 1 filing. With respect to the use
 54 of fish screens as part of a downstream bypass system, the document states (p. 28):

55 *"At smaller hydroelectric projects it is sometimes possible to screen all fish away from*
 56 *the turbines and divert them through a safe downstream bypass facility under all but*
 57 *flood flow conditions. This is accomplished through the use of full exclusionary screens,*
 58 *which screen all of the flow entering the turbines based on well established fish*
 59 *screening criteria designed to allow fish to maintain swimming control and orientation,*
 60 *so they may swim away from the screens and enter bypass systems. However, on larger*
 61 *rivers full exclusionary screening is typically not practical because screens sized to meet*
 62 *safe design standards for juvenile fish would need to be so large they would be nearly*
 63 *impossible to operate and maintain due to debris and ice loads, and would likely cause*
 64 *greater injury and mortality to small fish than passage through the turbines. This is*
 65 *especially true when fisheries features are integrated into the design of turbines, such as*
 66 *those planned for the Keeyask GS. For example full exclusionary screens designed to*
 67 *industry accepted criteria at Keeyask GS would require a screen area over 3.5 hectares*
 68 *(8.6 acres, based on National Marine Fisheries Service (NMFS)⁴ criteria of 0.4 feet per*

to fulfill all life history requirements upstream and downstream of the generating station. See memo attached to CEC Rd 2 CEC-0099 for more information with respect to Lake Sturgeon movements.

69 *second approach velocity on an exclusionary screen with active screen cleaners), with*
 70 *multiple bypass systems and automated screen cleaners. This would be an extremely*
 71 *difficult screening system to operate and maintain, and screening systems of this size*
 72 *simply do not exist in the industry as they are considered infeasible."*

73 The document concludes, with respect to downstream fish passage (p. 31):

74 *" The turbine and spillway passage routes noted are expected to deal appropriately with*
 75 *downstream fish passage. Due to uncertainty regarding their likelihood of success and*
 76 *the immature state of technology for the downstream passage of the target species, no*
 77 *alternatives were found which offered a viable option preferable to turbine passage."*

78 Due to the technical difficulty and high cost associated with designing a downstream
 79 fish pass system into the station itself, this option is not being considered. It is the
 80 Partnership's understanding that fish diversion/bypass methods have been successfully
 81 implemented at smaller facilities, but we are not aware of their use for a multiple
 82 species assemblage of large-bodied fish moving at all times during the open water
 83 season (i.e., not a season specific migration), in particular in environments with extreme
 84 ice conditions. With respect to relative scale, it should be noted that flow in the lower
 85 Menominee River is in the order of 60 cms, compared to typical flows in the Nelson
 86 River at the Keeyask site of 2,000 to 4,000 cms.

87 The Partnership would like to clarify that the statement that angled screens are an
 88 experimental approach was in reference to fish passage for Lake Sturgeon; it is our
 89 understanding that methods of passing this species either upstream or downstream
 90 over hydroelectric dams is not well established, as noted by Coscarelli et al. (2011, p. 4)
 91 at a workshop to examine methods to enhance lake sturgeon passage at hydroelectric
 92 facilities on the Great Lakes:

93 *" Additionally, the design, development, and implementation of structures that*
 94 *pass lake sturgeon around hydroelectric facilities are comparatively lacking.*
 95 *More specifically, very few solutions for accomplishing successful upstream and*
 96 *downstream sturgeon passage have been tested through a systematic*
 97 *examination of variation in physical stream conditions and technical*
 98 *modifications that best interact with the complex behavior of migrating adults,*
 99 *juveniles, and larvae."*



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Our file Notre référence

12 July 2013

Mr. Ken Adams
President
Keeyask Hydropower Limited Partnership
360 Portage Avenue
Winnipeg, Manitoba
R3C 0G8

Re: Fish Passage, Keeyask Generating Station Project

Dear Mr. Adams:

Fisheries and Oceans Canada (DFO), Manitoba Hydro, representing the Keeyask Hydropower Limited Partnership (KHLP), and Manitoba Conservation and Water Stewardship (MCWS) staff have met to define the best approach to addressing fish passage issues at the proposed Keeyask Generating station over a period reaching back to 2011. This letter documents the results of those efforts by confirming the agreed upon mitigation for the issues related to fish passage for the project.

One of the first and most critical elements to the establishment of mitigation for this project was the definition of Fisheries Management Objectives for the area of the proposed project. In October 2012, Manitoba Conservation and Stewardship presented DFO and Manitoba Hydro, on behalf of the KHLP, with the Manitoba Fisheries Branch Fisheries Management Objectives for the Keeyask Dam/Gull Lake Area (Attachment 1). DFO has reviewed both the objectives and the mechanisms that support the Fisheries Management Objectives, included in the above document.

There has been considerable discussion regarding fish passage, which is one of the mechanisms that support Manitoba's fisheries management objectives. For ease of understanding, the discussion surrounding fish passage at the project site is divided within this letter into two components, upstream and downstream passage. .

Upstream Fish Passage

In review of the documents for the Keeyask Generating station and in consultation with both Manitoba Hydro, on behalf of the KHLP, and Manitoba Fisheries Branch specialists, DFO has determined that there is insufficient data at this time to conclude that there is or is not significant upstream movement of fish past the site of the proposed Keeyask generating station. It is most probable that there is movement of lake sturgeon, walleye and whitefish, among other species, in an upstream direction. However, the magnitude, timing and importance of the fish movements to a sustainable fishery have not been adequately defined for this site. Furthermore, it is recognised that this knowledge is difficult and dangerous to obtain in the conditions at the proposed site.

All parties acknowledge that fish passage facilities are site specific, technically challenging and, at times, very expensive. Combined with incomplete current knowledge of fish movement at the site, it is premature to warrant installation of a long term upstream fish passage facility. However, DFO in discussions with Manitoba Hydro, on behalf of the KHLP, and MCWS has concluded that the following will be considered when determining authorization of impacts pursuant to the *Fisheries Act*:

- 1) The probable movement of lake sturgeon, walleye and whitefish, among other species, at the proposed project site should be considered as important to the lifecycle and ongoing productivity of these fishes, in the absence of site-specific data to the contrary.
- 2) The analysis of upstream fish movement, based on currently available, multiyear data, in addition to data collected prior to construction.
- 3) The opportunity for Manitoba Hydro, on behalf of the KHLP, for additional data collection in support of the project's Aquatic Effects Monitoring Program, to support MCWS Fisheries Management Objectives, and agreed to by MCWS and DFO. This program would determine the role of fish movement and the ability of habitat to support all life history requirements of fish such that productivity is maintained.
- 4) The results of these data and their role in the project's Aquatic Effects Monitoring Program would be reported to DFO and the MCWS each year. Based on these results, additional studies may be required. The requirement for fish passage facilities will be determined by DFO, in consultation with MCWS, based on the results of monitoring, established fisheries management objectives and support for ongoing fisheries productivity. In the event that DFO, in consultation with the MCWS, determines that all fish management objectives can be met and ongoing productivity can be supported without the installation of fish passage facilities, DFO will not require the installation of these facilities as part of the proposed development. Dependent on the long term sustainability of the fishery, as determined by regulators with input from local communities, installation of fish passage facilities may be required at a future date.

5) The requirement for the Manitoba Hydro, on behalf of the KHLP to include in its planning and construction design, those fish passage facility elements necessary to allow for economically and technically feasible retrofits to occur. Planning would include siting of future fish passage facilities. Manitoba Hydro, on behalf of the KHLP has undertaken an examination of fish passage options and has indicated that there are technically and economically feasible retrofit options.

Downstream Fish Passage

The ability for downstream fish passage to occur only through the turbines has implications for fisheries productivity due to changing access to habitats and increased mortality from impingement and entrainment of fish. Based on discussions with Manitoba Hydro, on behalf of the KHLP, DFO has determined that additional fish exclusion, beyond that provided for by trashracks with appropriate bar spacing at the turbine intake, to prevent fish from being entrained through the generating station may not be warranted at this time. As there is some uncertainty as to the potential magnitude of the death of fish moving through the new Keeyask generating station, considerations for authorization of impacts pursuant to the *Fisheries Act* would include the following:

- 1) The opportunity for the Manitoba Hydro, on behalf of the KHLP, to monitor fish movement through the generating station to determine the timing and magnitude of fish mortality by species.
- 2) The status of lake sturgeon in this reach of the Nelson River currently assessed by COSEWIC as “endangered”, and the need to consider specific measures to mitigate impacts on the species and their habitats.
- 3) The development of an adaptive management program by Manitoba Hydro, on behalf of the KHLP, in consultation with DFO and MCWS that seeks to minimize the impacts to fish. Based on the results of monitoring, the need for further downstream fish passage or additional fish exclusion measures will be determined by DFO in consultation with MCWS and community stakeholders. In the event that a scientifically defensible monitoring program demonstrates all Fisheries Management Objectives can be met and sustainability and ongoing productivity of fisheries can be supported without the installation of additional downstream fish passage works or modifications to the generating station complex, DFO will not require these changes.

Should you have any questions or comments, please do not hesitate to contact Julie Dahl (DFO) by phone 204-983-5164, or by email Julie.Dahl@dfo-mpo.gc.ca at your convenience to discuss the proposed project.

Yours sincerely,



Dale Nicholson
Regional Director, Ecosystems Management
Central and Arctic Region
Fisheries and Oceans Canada

Copy: Brian Parker, Manitoba Conservation and Water Stewardship

Manitoba Fisheries Branch - Fisheries Management Objectives

Keeyask Dam / Gull Lake Area

Oct, 2012

CONTEXT

The proposed Keeyask Hydroelectric project will separate Stephens Lake (the human-created reservoir for Kettle Generating Station) from the mainstem of the Nelson River, downstream of Split Lake and Clark Lake. The proposed development is expected to back-flood the Nelson River, creating a reservoir that will change hydraulic and hydrologic conditions upstream of the proposed development at least as far as Birthday Rapids – an area understood to be a significant Lake Sturgeon habitat. These changes to the hydrograph are expected to have consequential changes to the responding physical habitat and to the biota currently within the area. These fisheries management objectives have been prepared at the request of the proponent based on the assumption that the proposed project receives regulatory approval. Therefore, the objectives are based on best-case / desired outcomes under the development scenario and reflect objectives generally for the area bounded by Birthday Rapids to the outflow of Stephens Lake. Provincial fisheries management objectives are neither an endorsement nor a criticism of any project or development, but are a solicited response to proponents who seek to mitigate the effects of their work on fish stocks and habitats and contribute to Fisheries Branch management of those stocks.

FISHERIES MANAGEMENT OBJECTIVES (FMOS)

Objectives

- Target species that support local fisheries (Walleye, Northern Pike, Lake Whitefish) should exist at levels that support a sustainable harvest.
- Maintain self-sustaining stocks (including forage and other non target fish species) in the form they currently exist (i.e. acceptably similar or appropriate ecological structure and function).
- In addition to this, it is noted that a viable whitefish population that is valued for subsistence harvest¹ is found in Gull Lake. This population should continue to exist at levels that support sustainable harvest.
- A viable population of Lake Sturgeon above the proposed Keeyask Generating Station site.
- Conditions that support the development of a viable and self-sustaining population of Lake Sturgeon in Stephens Lake.
- Determination for the need for fish passage (types, timing, mechanisms and species) to support future stocks associated with the new ecosystem should be based on scientifically experimental and defensible assessment in conjunction with provincial management goals and in consultation with provincial fisheries managers.

Mechanisms that support FMOs

- Mitigate habitat degradation / destruction both above and below the proposed GS.
- Avoid further decline of the existing Lake Sturgeon population.
- Use stocking to recover stocks and for rehabilitation purposes (particularly in the upstream area) to the point where over the long term a self sustaining population more capable of meeting the domestic needs of the local communities is established.
- Stocked sturgeon should be recruited to brood stock to increase the contribution of natural reproduction instead of being used to increase the sustainable harvest.
- Since management and conservation efforts for this area are dependent on the support and endorsement of local First Nation harvesters, it is critical that the purpose of any stocking program be suitably communicated to users to ensure that the stocking does not undermine the conservation message.
- Local sturgeon management and conservation efforts to ensure that existing stocks are sustainable.
- Provision for future fish passage should be set aside (i.e. allocated) during project planning and construction.
- Any sturgeon stocking plan should be presented to local users in a manner that supports the management and conservation messages planned within it, and does not present a false confidence in the robustness of stocks.
- Programs that compensate for lost fishing opportunities in the project area with increased fishing opportunities in other areas are considered a project effect and may require additional management or mitigation measures.

¹ The term *subsistence harvest* used here refers only to fish stock capacity and does not reflect either the health or any other measure of fish quality of the fishes within those stocks.

1 **REFERENCE: Volume: Physical Environment Supporting Volume;**
 2 **Section: N/A; Page No.: N/A**

3 **CEC Rd 2 CEC-0092**

4 **ORIGINAL PREAMBLE AND QUESTION (CEC-0058):**

5 Several hydraulic models (1D, 2D, 3D and physical models) were developed by Manitoba
 6 Hydro to simulate the hydraulic conditions of the Nelson River between Split Lake and
 7 Stephens Lake.

8 Very few details are provided about the calibration of these models. Water level
 9 tolerances and overall water level absolute differences are included for 1D and 2D
 10 models. No specific calibration results are provided in the form of tables or figures to
 11 compare the measured data with the computed data within the study area. In addition,
 12 the scenarios used for the calibration of the various models are not defined. Therefore,
 13 there is not enough information in the report to properly assess the validity and
 14 accuracy of the flow calculations.

15 Appendix 4B briefly describes the numerical and physical models used. However, the
 16 information does not permit an assessment of the models quality. The number and
 17 location of the 1D cross-sections, for example, are not provided, nor a map. Also, details
 18 about the 2D modelling mesh, such as location map, number of nodes and mesh
 19 density, are not included. Several questions about the models are highlighted below.

20 Multiple channels reaches (Caribou Island and Gull Rapids) were modelled in 1D and
 21 large water level differences (0.3 m) were provided as results. This is not surprising due
 22 to the complex hydraulic conditions on those reaches, which cannot be reproduced by a
 23 1D model. These reaches should have been modeled in 2D.

24 The results of 2D simulations of the Construction Design Flood (CDF) during Stage II
 25 Diversion show very high flow velocities (up to 12 m/s) downstream of the spillway.
 26 Mitigation measures should be planned to limit erosion and potential damage to the
 27 downstream structures.

28 **APPENDIX 4B-1 ONE-DIMENSIONAL OPEN WATER MODEL – HEC-RAS (PAGE 4B-1)**

29 • **Cross-sections**

- 30 ○ How many cross-sections are included in the model?
 31 ○ A location map of the numbered cross-sections should be provided.
 32 ○ A transversal profile of each individual cross-section should be provided.

- 33 · First paragraph (page 4B-1): "These one-dimensional models can be used to
 34 effectively simulate open-water hydraulic conditions for a range of flow between
 35 1,000 m³/s to 6,000 m³/s as this is the range of flow the models were calibrated to."
 36 ○ With what real values (not rounded numbers) were the models calibrated?
 37 ○ The results of all calibration scenarios should be presented in order to show
 38 the validity of the model. Computed water levels should be compared with
 39 measured water levels and presented in the form of a table or longitudinal
 40 river profile plot.
 41 ○ The Construction Design Flood (CDF: 6,358 m³/s) is out of range. Does this
 42 mean that the results of the simulations of the CDF are not valid?

43 APPENDIX 4B-2 TWO-DIMENSIONAL OPEN WATER MODEL – MIKE 21 (PAGE 4B-2)

- 44 · Model mesh (unstructured triangular elements)
 45 ○ Details about the modelling mesh should be provided, i.e.:
 46 § Number of elements/nodes;
 47 § Mesh density by zones.
 48 ○ Maps of the 2D mesh: a general view and closer views next to Keeyask GS
 49 structures should be provided.
 50 ○ Was the model designed to represent the flow conditions only upstream of
 51 the future structures (intake and spillway)?
 52 ○ A figure similar to figure 4.4-9 should be presented for the velocity
 53 distribution in the north channel (future conditions).
 54 · Second paragraph (page 4B-2): "simulated water levels matched rating curves based
 55 on measured water levels within a tolerance of approximately 0.2 m"
 56 ○ The results of all the calibration scenarios should be presented in order to
 57 show the validity of the model. The computed water levels should be
 58 compared with measured water levels and presented in the form of a table,
 59 longitudinal river profile plot or 2D layout map.
 60 · Second paragraph (page 4B-2): "For verification, simulated velocities also compared
 61 well with measured velocity profiles collected at several specific locations along the
 62 reach."
 63 ○ More details should be provided, i.e. locations of the verification spots, and
 64 comparisons between measured and computed velocities.

65 APPENDIX 4B-3 H01E BACKWATER MODEL (PAGE 4B-2)

- 66 · The specific need to use the H01E model is not fully explained.
 67 · Was the H01E model used simply to validate the HEC-RAS model? HEC-RAS could
 68 probably have been used to perform all H01E simulations. In this context, the
 69 development of a second 1D model appears redundant.

- 70 · What was the water level tolerance for the H01E model? Was it the same as in HEC-
71 RAS?
72 · Were the project cofferdams and diversion structures also simulated with HEC-RAS?
73 Why was the H01E model preferred for this task?

74 APPENDIX 4B-4 FLOW-3D MODEL (PAGE 4B-2)

- 75 · As stated, the FLOW-3D model was used to provide multi-dimensional estimates of
76 flow velocity patterns. However, the extent of the 3D model is not given and the
77 report does not include the model output (no results, no map, and no figures).
78 · The FLOW-3D model probably covers the Gull Rapids area and it was therefore used
79 to design hydraulic structures, such as the spillway. However, this information is not
80 stated clearly in the report.
81 · What was the water level tolerance in the FLOW-3D model?
82 · Was the model compared with the MIKE 21 model?

83 APPENDIX 4B-7 PHYSICAL MODELS (PAGE 4B4)

- 84 · The report does not include model results.
85 · Where were the major differences between the physical and numerical models
86 located? What caused these differences?
87 · What was the water level tolerance in the physical models?
88 · Some river ice processes could have been modelled using the physical model. Was
89 ice included in any way in the physical model?

90 APPENDIX 4B-8 ONE-DIMENSIONAL WINTER MODEL – ICEDYN

- 91 · As mentioned, the ICEDYN model is a numerical model that is still under
92 development. The model does not reproduce all ice processes, such as ice jams, ice
93 breakups, ice runs, and ice cover cracking.
94 · Was the calibration of the ICEDYN model only based on water level?
95 · Was ice thickness used a calibration parameter? How do measured and modelled
96 ice thicknesses compare?
97 · Was the presence/absence of ice a calibration parameter? How does the
98 presence/absence of measured and modelled ice compare throughout the
99 calibration of winter seasons?

100 **FOLLOW-UP QUESTION:**

101 The response includes a reference about supporting Technical Memorandums (TM).
102 Specific information about hydraulic models is included in Technical Memorandums. 1D:
103 TM GN 9.1.3 and GN 9.1.13 2D : TM GN 9.1.4 ICEDYN : TM GN 9.1.6 and 9.1.7 We don't

104 think these are available in the public documentation. Please provide or point us to
105 where they can be found.

106 **RESPONSE:**

107 All of the available study reports and technical memos associated with the EIS Filing are
108 outlined in Appendix 6A of the Response to EIS Guidelines and are available to Hearing
109 Participants upon request.

110 A CD of all the Appendix 6A reports was previously provided to the CEC on May 15,
111 2013. The specific reports identified in this Information Request have also been included
112 on the CD of technical reports provided with this filing.

1 **REFERENCE: Volume: Physical Environment Supporting Volume;**
 2 **Section: 4.0 Surface Water and Ice Regimes; Page No.: N/A**

3 **CEC Rd 2 CEC-0093**

4 **ORIGINAL PREAMBLE AND QUESTION (CEC-0059):**

5 With respect to the report, Keeyask Generation Project - Physical Environment
 6 Supporting Volume - Surface Water and Ice Regimes, June 2012 was published in 2012,
 7 there were a number of questions about: data and information sources; assumptions;
 8 and, description of numerical models and methods.

9 Data and Information Sources

- 10 • First bullet (page 4-9): "Periodic water levels have been collected [...] at 35
 11 locations"
- 12 ○ The 35 locations should be shown on a map.
- 13 • Second bullet (page 4-9): "Discharge measurements ..."
- 14 ○ How were the measurements recorded in winter?
- 15 ○ Was the discharge data corrected to take ice effects into account?
- 16 • Third bullet (page 4-9): "Automatic water level gauge data collected at five locations
 17 ..."
- 18 ○ These locations should be shown on a map.
- 19 • Fourth bullet (page 4-9): "Discharge and water level data from the Kettle GS for the
 20 period 1977 to 2006"
- 21 ○ Is this information the same as that of Environment Canada's station
 22 05UF006 (Nelson River at Kettle GS)?
- 23 ○ This information is crucial for surface water analysis. Thus, more detail
 24 should be provided about calculation methods and data reliability regarding
 25 all flow ranges.
- 26 ○ The period after 2006 should be included in the analysis.
- 27 • Eighth bullet (page 4-9): "Water velocity profiles collected at 36 locations in 2003."
- 28 ○ How was this information used in the hydraulic analysis?
- 29 ○ Was it used for model calibration? If so, how do data and models compare?
- 30 ○ How were the locations selected?
- 31 ○ The 36 locations should be identified on a map.
- 32 • Eleventh bullet (page 4-10): "Hydraulic reports and engineering design memoranda
 33 [...] included hydraulics relationships such as stage-discharge and stage-storage
 34 curves."
- 35 ○ Complete references regarding these reports should be provided. – This
 36 information is required to calculate the projects inflows.

- 37 · Last sentence (page 4-11): "...local knowledge was obtained through presentation
38 and discussion of initial results."
39 ○ Which local communities were involved and where are they located?
40 ○ What knowledge was learned from them?
41 ○ What were the "issues of concerns" related to river flow and river ice?

42 Assumptions

- 43 · Second bullet (page 4-12): "The magnitude and variability of the monthly Project
44 inflow record is assumed to be representative of future monthly Project inflows."
45 ○ This assumption should be supported by an analysis of years 2006 to 2012.
46 · Fourth bullet (page 4-12): "The current river morphology is assumed to be
47 representative of the river in the future for all hydraulic studies."
48 · This assumption should be supported by sedimentology observations.
49 · Which are the areas where sedimentation is likely to modify the river's morphology
50 and the hydraulic conditions?

51 Description of Numerical Models and Methods

- 52 · Third paragraph (page 4-13): "The accuracy of the numerical models [...] is best
53 quantified by the level of calibration attained for each of the models"
54 ○ Which calibration scenarios have been used? Were they steady state?
55 ○ Appendix 4B provides some details about calibration. See comments on
56 pages 11 and 12 of this document.
57 · Third paragraph (page 4-13): "In some locations, such as Gull Rapids area, these
58 differences can be 0.3 m due to the complex hydraulic conditions in this reach"
59 ○ Is this the calibration result of the 1D HEC-RAS model?
60 ○ Does the model overestimate or underestimate the water levels?
61 ○ A 2D model is best suited to represent the flow conditions in multiple
62 channel areas. What water level differences were obtained in these areas
63 with the MIKE 21 model?
64 · Fourth paragraph (page 4-13): "Some differences of up to 2 m exist at certain
65 locations [...] for specific points in time."
66 · Does the model overestimate or underestimate the water levels?
67 · How do these errors affect the overall validity of the model?
68 · Specific conditions leading to differences greater than 1 m should be analysed and
69 discussed.

70 **FOLLOW-UP QUESTION:**

- 71 The response includes a reference to specific information about hydrology that is
72 included in Technical Memorandum GN 9.1.1. Please provide.

73 **RESPONSE:**

74 All of the available study reports and technical memos associated with the EIS Filing are
75 outlined in Appendix 6A of the Response to EIS Guidelines and are available to Hearing
76 Participants upon request.

77 A CD of all the Appendix 6A reports was previously provided to the CEC on May 15,
78 2013. The specific reports identified in this Information Request have also been included
79 on the CD of technical reports provided with this filing.

1 **REFERENCE: Volume: Physical Environment Supporting Volume;**
2 **Section: 4.0 Surface Water and Ice Regimes; Page No.: N/A**

3 **CEC Rd 2 CEC-0094**

4 **ORIGINAL PREAMBLE AND QUESTION (CEC-0062):**

5 The report states that river ice processes on the lower Nelson River have been studied
6 for many years by Manitoba Hydro. However, references to support this statement are
7 not provided. In order, to anticipate ice-related issues at Keeyask GS, it would be
8 interesting to detail the lessons learned over the years by Manitoba Hydro at neighbour
9 hydropower sites.

10 Local knowledge and issues of concern regarding river ice was obtained via
11 presentations and discussions with local communities. However, the report does include
12 details on this knowledge and the issues of concern.

13 The numerical model used to simulate ice formation processes is ICEDYN, which is still
14 under development and cannot simulate the processes involved during spring breakup.
15 Very little detail is provided about the model and its calibration. The model was
16 calibrated based on measured water level and very large differences (up to 2 m) were
17 obtained at specific points along the reach under study. The validity of the model
18 regarding other parameters (ice thickness or the presence/absence of ice) does not
19 seem to have been assessed.

20 It is expected that the average thickness of the reservoir's ice cover will be between
21 approximately 0.8 to 1.2 m by the end of winter. This range of ice thickness is low,
22 especially when compared with the operating range of the reservoir (1 m). This situation
23 is likely to promote ice ridging.

24 Results indicate that "velocities will also increase by up to 0.5 m/s or more over existing
25 environment values in the north channel of Gull Rapids as this is where the intake to the
26 powerhouse will be located". In these conditions, the ice cover is likely to be unstable
27 near the intake. The risks associated with this situation require further analysis.

28 As mentioned before, ICEDYN cannot simulate conditions during spring breakup.
29 Therefore, the impacts related to the breakup of an ice jam located at Birthday Rapids
30 have not been assessed. This should be added to the list of residual effects and analysed
31 via an alternative method: either a physical model or a numerical model such as
32 CRISSP2D.

33 **Specific Comment – References and Documentation**

34 Last paragraph (page 4-5): "ice formation on the Lower Nelson River [...] has been
35 studied for many years by Manitoba Hydro."

- 36 ○ Are there references to support this statement?
- 37 ○ Based on the lessons learned over the years by Manitoba Hydro (MH), what
38 are the main issues related to river ice and hydropower generation on the
39 Lower Nelson River?
- 40 ○ It would be interesting to document historical events of ice problems at MH
41 dams on the Nelson River, such as ice jams that forced flow reduction and
42 ice damages to civil and mechanical structures, e.g. turbines.

43 **Specific Comment – Satellite Imagery**

44 With respect to ice conditions, third paragraph, second bullet (page 4-8): "satellite
45 imagery"

- 46 ○ Typical images would have been interesting in appendix.
- 47 ○ Which products were used: name, type of image, resolution?

48 **Specific Comment – Reservoir Reach**

49 · First paragraph (page 4-91): "The reservoir ice cover will be very similar to the lake
50 ice cover that presently forms on Stephens Lake. It is expected that the average
51 thickness of the reservoir ice cover will be between approximately 0.8 to 1.2 m by
52 the end of winter."

- 53 ○ This range of ice thickness is low, especially when compared with the
54 operating range of the reservoir (1 m). This situation is likely to promote ice
55 ridging. Please explain.
- 56 · Last paragraph (page 4-95): "ICEDYN model cannot simulate the processes involved
57 during the spring breakup period"
- 58 ○ How were these processes taken into account in the analysis?
- 59 ○ The breakup of an ice jam in Birthday Rapids may create a surge and an ice
60 run.
- 61 ○ The propagation of an ice breakup surge should be simulated.

62 **FOLLOW-UP QUESTION:**

63 The Response referred to specific information about ice processes included in Technical
64 Memorandum GN 9.1.6. Please provide.

65 **RESPONSE:**

66 All of the available study reports and technical memos associated with the EIS Filing are
67 outlined in Appendix 6A of the Response to EIS Guidelines and are available to Hearing
68 Participants upon request.

69 A CD of all the Appendix 6A reports was previously provided to the CEC on May 15,
70 2013. The specific reports identified in this Information Request have also been included
71 on the CD of technical reports provided with this filing.

1 **REFERENCE: Volume: Physical Environment Supporting Volume;**
 2 **Section: 4.0 Surface Water and Ice Regimes; Page No.: N/A**

3 **CEC Rd 2 CEC-0095**

4 **ORIGINAL PREAMBLE AND QUESTION (CEC-0061):**

5 With respect to the report Keeyask Generation Project - Physical Environment
 6 Supporting Volume - Surface Water and Ice Regimes, June 2012, we had the following
 7 comments on residual effects.

- 8 • Ice Regime (page 4-108)
 9 o The following residual effect should be added:
 10 § The breakup of an ice jam at Birthday Rapids may result in the
 11 release of a surge. The magnitude, extent, duration and frequency
 12 of this phenomenon need to be defined based on additional
 13 simulations.
 14 • Effect during operation - Downstream of Project Site (page 4-111)
 15 o The following residual effect should be added:
 16 § The duration and frequency of the dewatering of Gull Rapids Outlet
 17 will be increased.

18 **FOLLOW-UP QUESTION:**

19 Based on the Response provided by Manitoba Hydro shouldn't the increase of the
 20 dewatering duration and frequency of the outlet of Gull Rapids Creek be added to the
 21 list of residual effects (Table 4.4.7 - Summary of Residual Effects)?

22 **RESPONSE:**

23 Since the outlet of Gull Rapids Creek is within the dewatered area of the Gull Rapids
 24 south channel, the residual effect referenced in the Information Request is already
 25 captured in the surface water and ice regime residual effects table (PESV, Table 4.4-7,
 26 page 4-111, 2nd row) and also within the aquatic habitat residual effects table (AESV,
 27 Table 3-11, page 3-58, 2nd row).

28 The residual effect in the PE SV states:

29 When the spillway is not operational (approximately 88% of the time based on
 30 historical records), portions of the south channel of Gull Rapids will be dry. Due to
 31 the limited bathymetry available in this area, the exact location of these dry areas is
 32 uncertain at this point and will not be confirmed until the Keeyask GS is operational.

33 The residual effect in the AE SV states:

34 Gull Rapids downstream of the GS will be dewatered (south channel) or converted
35 into a tailrace channel, eliminating these areas as productive fish habitat.

36 Dewatering of Gull Rapids also removes a defined channel for Gull Rapids Creek to
37 flow in, disconnecting the creek from the Nelson River. A portion of the south
38 channel will be wetted during operation of the spillway, but this area is not
39 expected to provide productive fish habitat.

1 **REFERENCE: Volume: Physical Environment Supporting Volume;**
 2 **Section: 7.0 Sedimentation; Page No.: N/A**

3 **CEC Rd 2 CEC-0096**

4 **ORIGINAL PREAMBLE AND QUESTION (CEC-0067a,b,c):**

5 The Report, "Keeyask Hydropower Limited Partnership, Keeyask Generation Project -
 6 Physical Environment Supporting Volume – Sedimentation, June 2012" was reviewed.
 7 The report is intended to describe the sedimentation processes operating in the project
 8 area and how the baseline environment will change under Project conditions. Some
 9 questions and further explanations are required and are identified below.

10 **CEC-0067a**

11 The stated objectives of the Sedimentation section are:

- 12 · Characterization of historical and current sedimentation processes (bed material
 13 transport, suspended sediment transport, deposition).
 14 · Prediction of future sedimentation processes, mineral and organic suspended solids
 15 concentrations (nearshore and offshore), sediment transport (mineral and organic)
 16 and deposition rates, thickness, and volumes for (1) the construction period, (2)
 17 future conditions/trends, and (3) future environment with the Keeyask GS.

18 We have assumed that Item (2), future conditions/trends, refers to projections of what
 19 will happen in the future under no-Project conditions.

20 The report and appendices contain considerable qualitative discussion about
 21 sedimentation processes and presents the results of the numerical modeling that was
 22 conducted to quantify these processes. An extended discussion of the modeling
 23 approach is presented in Appendix 7A, along with descriptions of the input data sources
 24 and the field data available for calibration. Unfortunately, the bulk of the input data are
 25 not provided and the descriptions are not of sufficient detail to perform a thorough
 26 review of the underlying models or the methods that were used to apply them. In
 27 addition, although the qualitative descriptions of sedimentation processes are generally
 28 correct, they neglect key processes that appear to have led to application of the models
 29 in a manner that is, at best, confused, and in many cases, may be inappropriate. The
 30 objectives include significant emphasis on the transport and deposition of bed and
 31 suspended (i.e., mineral) sediment and organic suspended solids; however, the
 32 modeling results focus primarily on suspended sediment concentrations. The focus on
 33 suspended sediment concentrations is appropriate for assessing water quality impacts;
 34 however, this focus is misplaced with respect to potential project effects on channel

35 geomorphology, including bank erosion and in-channel erosion and deposition
36 processes.

37 As noted in Section 7.1.1.1, mineral sediment transport can be divided into two primary
38 categories:

- 39 · Bed load, or the typically coarsest fraction of the load that moves in contact with
40 the bed, and
- 41 · Suspended load.

42 A key concept that is not mentioned is the distinction between bed material load and
43 wash load. The failure to recognize this distinction appears to be largely responsible for
44 the inappropriate approaches that were used for significant portions of the analysis.

45 Bed material load refers to the portion of the total load that is made up of particles
46 found in significant quantities in the bed, and it consists of two components: bed load
47 and suspended bed material load (ASCE, 2007; Simons & Senturk, 1992). This portion of
48 the load is primarily responsible for the geomorphic behavior of the channel(s), and it
49 can be quantified using an appropriate equilibrium transport equation with hydraulic
50 conditions estimated through numerical modeling and measured bed material size
51 gradations. The wash load is made of up of particle sizes that are not found in significant
52 quantities in the bed (ASCE, 2007; Simons & Senturk, 1992).

53 The wash load consists of particles that are much finer than the typical bed material, in
54 most cases silts and clays, although even sand can fit into this category in coarse-grained
55 rivers with a relatively low sand supply. By definition, the wash load is supply-limited,
56 meaning that the amount being carried by the river at any given location and time is
57 controlled by the supply, and not by the local hydraulic conditions and bed material
58 characteristics. This is the most likely reason that the measured suspended sediment
59 concentrations have poor correlation with instantaneous discharges (p 7-13, last
60 paragraph). Because it is supply limited, the wash load component cannot be quantified
61 with the type of numerical modeling that was employed in this study. Unfortunately, the
62 vast majority of the sediment load that is considered in the study is in the wash load
63 category. Please explain.

64 **CEC-0067b**

65 Modeling of mineral sedimentation processes was conducted using a range of models,
66 including the two-dimensional (2D) Mike-21 and the 1D HEC-RAS and HEC-6. The
67 algorithms in these models were developed to quantify erosion and deposition of non-
68 cohesive sediment based on mass conservation using semi-empirical sediment transport
69 functions that were primarily developed for sand and coarser material. An important
70 aspect of the sediment transport functions is that they were developed for equilibrium

71 transport conditions; the predicted bed and suspended bed material loads represent the
72 capacity of the river to carry the indicated sizes based on the local hydraulic conditions
73 and bed material characteristics. The Limitations Section (7A1.1.4) discuss issues with
74 simulating transport of cohesive material and includes the following statement:
75 ...limitations of the model in computing relatively fine cohesive material were addressed
76 by applying rigorous calibration procedures to confirm the applicability of the model...
77 This section further states that only 10% to 20% of all suspended sediment has a mean
78 diameter of less than 0.004, which is the upper limit of clay; thus, the majority of the
79 suspended material is non-cohesive and a non-cohesive model formulation was
80 considered to be appropriate and necessary. Unfortunately, the transport equations
81 available in these models are also not applicable for silt that falls in the size range
82 between 0.004 mm and 0.062 mm, and this appears to be the bulk of the material that
83 is transported through the reach. Please explain.

84 **CEC-0067c**

85 For the Mike-21 modeling, the upstream boundary sediment concentrations were
86 estimated in Clark Lake using the total load theory of Engelund and Hansen (1967) and
87 ...transport of this sediment load was then simulated by the suspended sediment load
88 theory of Galappatti (1983). The Engelund and Hansen (1967) equation is a semi-
89 empirical bed material load equation that was developed for sand bed streams. This
90 equation is not applicable to the silt/clay fraction (i.e., sizes finer than 0.062 mm).
91 Galappatti (1983) is a numerical method of estimating a first-order adjustment to the
92 sand concentrations derived from equilibrium transport equations to account for the
93 phase-lag between the depth-averaged concentrations and depth-averaged velocities.
94 This method could potentially be applied to the silt fraction, but it requires equilibrium
95 transport conditions in which the suspended sediment load is being carried at capacity
96 based on the hydraulic conditions and bed material sizes, a condition that is almost
97 certainly not met in most, if not all, portions of the study reach. In spite of the
98 calibration efforts, the model does not represent the sedimentation dynamics of the
99 silt/clay size fractions, and the results are therefore not meaningful with respect to the
100 questions that are being evaluated. Please explain.

101 **FOLLOW-UP QUESTION:**

102 Please see subsequent IR based on Manitoba Hydro Response below. In spite of the
103 discussion of dimensionless parameters, the equations that were used in the modeling
104 are not applicable to the range of sediment sizes that are being modeled. The minimum
105 particle size for all of the equations listed in USBR (2006) Table 3.12 is 0.062 mm (i.e.,
106 fine sand), and modeling was conducted for sizes that are mostly in the range from
107 0.004 mm to 0.062 mm (i.e., silt). This is a serious flaw in the modeling approach
108 because the equations represent equilibrium transport conditions and these finer sizes
109 are being carried at rates significantly lower than equilibrium. Please respond.

110 The method that was used to simulate bank erosion using HEC-RAS is not appropriate.
 111 HEC-RAS simulates changes vertical in channel bed elevations based on the imbalance
 112 between sediment supply and the cross sectionally-averaged sediment supply using the
 113 Exner equation of sediment continuity. Bank erosion occurs through a variety of
 114 processes, including grain-by-grain erosion due to shear stresses acting directly on the
 115 bank and bank failure due to undercutting and geotechnical failure. Neither process is
 116 properly simulated in HEC-RAS. Some of the erosion may erosion be due to grain-by-
 117 grain erosion (Case 1), but use of cross sectionally-averaged hydraulic conditions and
 118 sediment continuity is clearly not appropriate since this is a very localized process. HEC-
 119 RAS does not simulate geotechnical failure, if that is, in fact, one of the processes
 120 operating in this reach. Please respond.

121 **RESPONSE:**

122 Part 1:

123 The Information Request correctly notes that the minimum particle size for all of the
 124 equations listed in USBR (2006) Table 3.12 is 0.062 mm (i.e., fine sand). However, the
 125 question states that “modeling was conducted for sizes that are mostly in the range
 126 from 0.004 mm to 0.062 mm (i.e., silt)”, which is not correct as the modeling did
 127 consider a wider range of sediment sizes. As presented in the Physical Environment
 128 Supporting Volume (PE SV, Section 7.2.1.1), the HEC-RAS model was utilized to estimate
 129 the total volume of sediment (suspended load and bedload) that would result from
 130 shoreline erosion. The Nelson River’s bank material that would contribute to the
 131 sediment load is comprised of very fine to coarse sediments with sizes that vary
 132 between 0.002 mm to 50 mm as shown in Figure 1 (Figure 34 in Technical Memorandum
 133 GN-9.2.10). Since shoreline materials are composed of both fine and coarse sediments,
 134 transport of both cohesive and non-cohesive materials was considered in the
 135 assessment.

136 The erosion and transport of non-cohesive sediment is discussed in PE SV (Appendix 7E),
 137 in Technical Memorandum GN-9.2.10, and in the response prepared for the CEC Rd1
 138 CEC-0067d.

139 The transport of cohesive sediment is discussed in Technical Memorandum GN-9.2.10
 140 (Section 6.3.3). As discussed in this memorandum, the transport of cohesive sediment is
 141 rather complex due to the electrostatic and electrochemical forces that bind sediment
 142 particles together. These forces make erosion and sediment transport of cohesive
 143 material fundamentally different from the transport of non-cohesive particles. In HEC-
 144 RAS, there are two methods to calculate cohesive sediment transport:

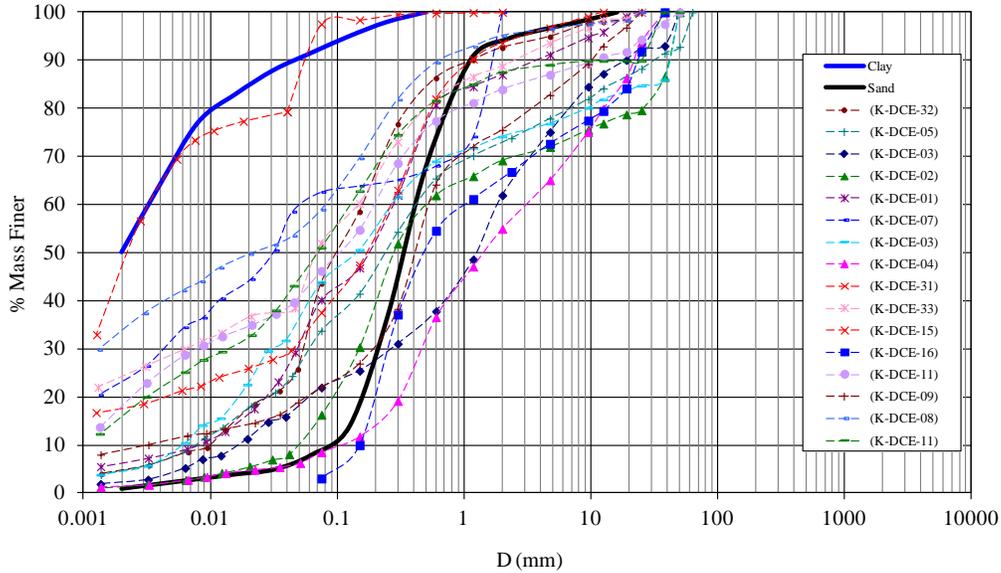
- 145 · using the standard transport functions
- 146 · Krone and Partheniades method

147 The first method simply uses sediment transport functions for non-cohesive particles
148 (selected in the model) for cohesive sediments as well. This method is a very
149 conservative approach and produces a very large sediment transport potential.
150 However, it can be useful in rivers where cohesive material is not being deposited and
151 eroded from the bed and banks in a large amount (such as the Nelson River). Krone and
152 Partheniades is a more involved method that requires information on the properties of
153 cohesive material in the study area such as critical shear threshold for particle erosion,
154 critical shear threshold for mass erosion, mass wasting threshold, mass wasting rate,
155 etc. [USACE 2008].

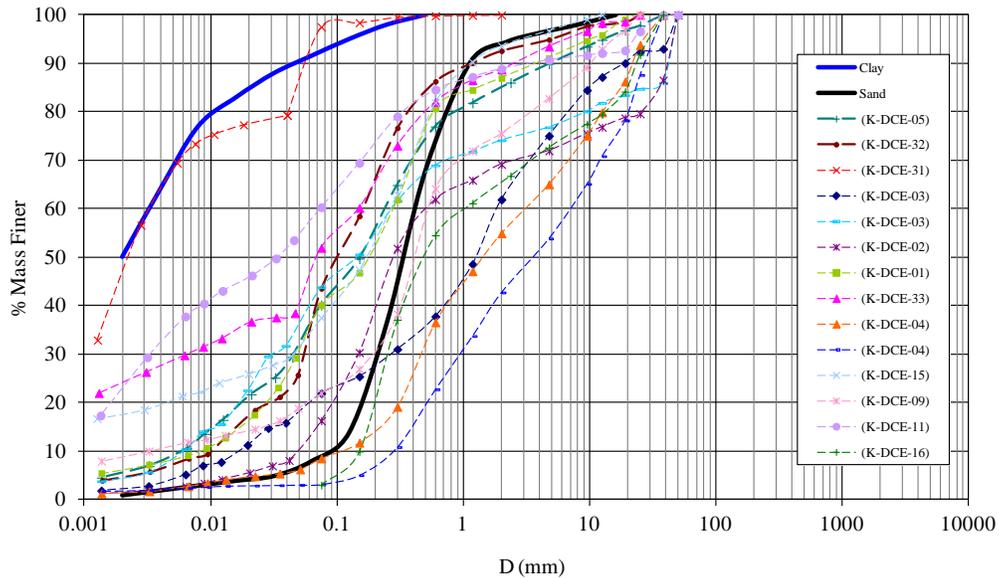
156 There are no direct measurements of cohesive material parameters in the study reach,
157 and the recommended values in literature vary in a wide range. The first method using
158 standard transport functions, therefore, was considered in this study to calculate the
159 transport of cohesive sediments (Technical Memorandum GN-9.2.10). The erosion rate
160 estimates would have been smaller had the Krone and Partheniades method been
161 selected because the shear stress required to erode a cohesive sediment is higher than
162 the shear stress required to erode a non-cohesive sediment.

163 This conservative approach in estimating shoreline erosion predicts higher contribution
164 to suspended load from the shore materials, and therefore overestimates depositional
165 rate of suspended sediments downstream of the project in Stephens Lake. These
166 conservative estimates were then considered in the assessment of project effects on the
167 aquatic environment during construction.

168 Based on the discussions made above on the applicability of the model and the relevant
169 equation as well as due to the built-in conservative approach taken in the analysis, the
170 Partnership is of the view that the model results are not seriously flawed.



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Figure 1: Keyask shoreline material gradation curves for flooded area between; a) Existing Environment to Stage I water level, b) Stage I to Stage II water level (For location of sampling sites see Figure 33 in Technical Memorandum GN-9.2.10) (Solid lines: theoretical gradations based on visual soil classification, dash lines: actual gradations obtained from shoreline sampling in 2009).

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179 Part 2:

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The Information Request correctly notes that the HEC-RAS model is not capable of simulating bank failure due to undercutting and geotechnical failure. However, it is noted that there is no industry-standard model capable of simulating all erosion

183 processes such as flow action, bank failure due to undercutting, geotechnical failure, ice
184 forces, etc.

185 The HEC-RAS model was selected to simulate the impact of increases in flow velocity
186 and shear stress along erodible banks because undercutting and geotechnical failure are
187 not dominant erosion processes in either the existing environment or during
188 construction. The shorelines with the greatest potential for erosion during construction
189 (Stage I and Stage II river diversion) are portions of the south shore of the south channel
190 of Gull Rapids upstream of the construction site because materials not previously
191 affected by river flow will be exposed to erosive forces (flow and shear stress) as water
192 levels increase (PE SV, Section 6.4.1 and Map 6.4-1. Due to the nature of the affected
193 shorelines, erosion is not expected to occur as a result of undercutting or geotechnical
194 failure.

195 As acknowledged in the PE SV, Section 7A, 2.1.2.3, by using a HEC-RAS 1D model, the
196 amount of erosion being predicted is conservatively overestimated. This overestimation
197 is due to the fact that the 1D averaged velocity in any river cross-section is being applied
198 for the purpose of estimating shoreline erosion due to the flow action. Flow velocity
199 varies greatly across the river, and nearshore velocities (and shear stress) in the areas
200 where erosion occurs would be lower than the sectionally-averaged velocity applied in
201 the model.

202 This conservative approach using a 1D model overestimates suspended sediment load
203 downstream of the project in Stephens Lake. These conservative estimates were then
204 considered in the assessment of project effects on the aquatic environment during
205 construction.

206 **REFERENCES:**

207 USACE, "HEC-RAS River Analysis System, Reference Manual Version 4.0.", CPD-68.
208 USACE, Hydrologic Engineering Center (HEC) 609 Second Street Davis, CA
209 95616-4687, 2008 (<http://www.hec.usace.army.mil/publications>).

1 **REFERENCE: Volume: Aquatic Environment Supporting Volume;**
 2 **Section: 6.0 Lake Sturgeon; Page No.: N/A**

3 **CEC Rd 2 CEC-0097**

4 **ORIGINAL PREAMBLE AND QUESTION (CEC-0027):**

5 Cumulative effects with respect to sturgeon do not seem to have been addressed in the
 6 EA report which is a significant deficiency. The Nelson River has already been
 7 substantially altered by various flow manipulations and developments such as the:
 8 Churchill River Diversion; Lake Winnipeg Regulation; construction and operation of the
 9 existing hydro facilities (e.g., Limestone, Long Spruce, Kettle, Kelsey) and associated
 10 reservoirs on the Nelson; commercial fishing; and possible future facilities (e.g.,
 11 Conawapa).

12 Original Question: It is worthwhile for KHLP to consider advancing Lake Sturgeon into
 13 the cumulative effects assessment. Based on a preliminary assessment, we do question
 14 whether there will be no adverse residual effects on the Lake Sturgeon population given
 15 existing and proposed developments on the Nelson River.

16 **FOLLOW-UP QUESTION:**

17 Response on cumulative effects is inadequate and does not address fish survival through
 18 multiple facilities (e.g. Limestone GS, Long Spruce GS, Kettle GS, proposed Keeyask,
 19 proposed Conawapa GS). What about entrainment estimates of stocked individuals?

20 Please calculate the expected fish survival of fish through multiple power plants using a
 21 broader definition of fish survival to include not only mortality associated with the
 22 turbines but also associated with the spillway and tailrace.

23 **RESPONSE:**

24 The response to this follow-up question addresses only the expected survival of Lake
 25 Sturgeon, as it is expected to be affected by the Keeyask Project (taking into account
 26 cumulative effects of the Keeyask Project combined with the effects of the other past,
 27 current and future projects considered in the Keeyask cumulative effects assessment).

28 Studies of adult Lake Sturgeon movements in the reach of the Nelson River that will be
 29 directly affected by the Keeyask Project (i.e., downstream of Clark Lake to Stephens
 30 Lake) have been on-going since 2001, providing a good understanding of sturgeon
 31 movements in this area. A memo discussing Lake Sturgeon movements and summarizing
 32 results from the Keeyask area is referenced in CEC Rd 2 CEC-0099. As noted in the
 33 memo, the recorded incidence of Lake Sturgeon moving from Gull Lake downstream to

34 Stephens Lake, and thus subject to the risk of mortality during passage past the Keeyask
35 Generating Station, is low (<2%/yr).

36 The cumulative effects assessment conducted for the Keeyask Generation Project
37 considered the overlap between adverse effects of the Project and other developments.
38 Adverse effects to Lake Sturgeon in the lower portion of the Keeyask reservoir and
39 Stephens Lake are predicted to occur during construction, but the creation of habitat
40 and augmentation of sturgeon numbers during operation is expected to result in a net
41 increase in sturgeon numbers. Adverse effects to Lake Sturgeon in this area from past
42 developments are summarized in the Response to EIS Guidelines Section 7.5.1.2 (p. 7-
43 18) as follows:

44 *“As summarized in Section 6.3.2.2.5, commercial fishing of lake sturgeon on the Nelson
45 River severely depleted populations both upstream and downstream of the Kelsey GS.
46 Precise estimates of commercial harvest for the area directly affected by the Keeyask GS
47 are not available as catches were recorded by river reach, but interviews with resource
48 users indicate a substantial commercial harvest in Gull Lake in the late 1950s and that
49 harvest continued in Stephens Lake following construction of the Kettle GS into the
50 1980s.*

51 *In addition to harvest, lake sturgeon in the Nelson River have been adversely affected by
52 hydroelectric development. Both CRD and LWR were reported to have caused a decline in
53 lake sturgeon numbers (Split Lake Cree – Manitoba Hydro Joint Study Group 1996c).
54 FLCN members stated that critical habitats were lost with each dam and fish could no
55 longer move as freely within their natural habitat, as they were able to prior to dam
56 construction (FLCN 2009 Draft). Technical studies have found that numbers of sturgeon
57 have declined at all locations on the Nelson River where the construction of generating
58 stations has altered habitat for specific life history requirements such as spawning.
59 However, healthy sturgeon populations have been documented in areas affected by
60 hydroelectric development where habitat to support all life history stages continued to
61 be available (see examples in Table 6-16).”*

62 There is no spatial overlap between adverse effects of the Keeyask Project to Lake
63 Sturgeon and populations of Lake Sturgeon downstream of the Kettle GS; therefore, the
64 cumulative effects assessment did not consider the cumulative risk of mortality that
65 could occur if theoretically a Lake Sturgeon left Gull Lake and moved further
66 downstream.

67 It should be noted that an adverse effect to Lake Sturgeon populations downstream of
68 the Kettle GS could only occur if the number of Lake Sturgeon moving downstream from
69 Gull Lake contributed measurably to these populations. Few Lake Sturgeon are present
70 in the two reservoirs immediately downstream of Stephens Lake (the forebays of the

71 Long Spruce and Limestone generating stations, respectively) and these are not
72 considered viable populations. The nearest downstream Lake Sturgeon population is
73 below the Limestone GS in the reach of the Nelson River extending to Hudson Bay. In
74 the theoretical case of a Lake Sturgeon moving downstream, even assuming 100%
75 mortality of adult sturgeon moving from Gull Lake past the Keeyask GS in the future,
76 and no mortality to any sturgeon moving past the Kettle, Long Spruce and Limestone
77 GSs today, 2% of the estimated 500 Lake Sturgeon present in Gull Lake equates to 10
78 fish, which would have no measureable effect to the population of 6,000 adult sturgeon
79 downstream of the Limestone GS.

1 **REFERENCE: Volume: Aquatic Environment Supporting Volume;**
 2 **Section: 6.0 Lake Sturgeon; Page No.: N/A**

3 **CEC Rd 2 CEC-0098**

4 **ORIGINAL PREAMBLE AND QUESTION (CEC-0029):**

5 A number of assumptions have been made regarding shifts in use from areas currently
 6 used for spawning, nursery and foraging habitat to other existing habitat or newly
 7 created habitat, particularly for spawning, young-of-the-year (YOY) and sub-adults. How
 8 confident is KHLP that sufficient habitat will be made available for all life stages of Lake
 9 Sturgeon? The Aquatic Environment Volume suggests that stocking appears to be the
 10 cornerstone of the prediction and that Lake Sturgeon numbers will increase regionally.
 11 However, stocking, in the absence of sufficient habitat of suitable quality will not create
 12 a viable self-sustaining population. This needs to be better addressed in the report. It
 13 would be important for KHLP to explain how there can be overall moderate to high
 14 certainty assessment for increases in population of Lake Sturgeon when there is a low to
 15 moderate statement specifically for YOY habitat? This is based on the following
 16 statement in Section 6.4.4.4 of the Aquatic Support Volume (p 6-48). "There is low to
 17 moderate certainty regarding the success of mitigation measures to create YOY habitat
 18 in the reservoir and moderate certainty regarding the success of mitigation measures to
 19 create spawning habitat in the reservoir and Stephens Lake. However, there is moderate
 20 to high certainty regarding effects to abundance following implementation of a stocking
 21 program, resulting in overall moderate to high certainty for the predicted increases in
 22 regional Lake Sturgeon numbers." There seems to be potential for significant loss of
 23 Lake Sturgeon habitat. From the MacDonnel thesis, the Kelsey rapids were an important
 24 spawning area historically (p. 122 and other around p. 56). Spawning was also reported
 25 to occur in the Grass River which appears to enter the Nelson from the west just
 26 downstream from Kelsey (and at Witchai Falls p. 122). Also spawning was evident in the
 27 Burntwood River and Odei River (Page 51, p. 119). Sturgeon were also abundant in Gull
 28 Lake (p. 119).

29 If future monitoring shows that habitat to support all life stages of Lake Sturgeon is no
 30 longer available, replacement habitat will be developed. This assumes that the type of
 31 habitat that is missing can be created. How would KHLP address this?

32 **FOLLOW-UP QUESTION:**

33 Follow-up question #1 for CEC-IR-029. Could KHLP confirm that the predicted "overall
 34 moderate to high certainty for the predicted increases in regional lake sturgeon
 35 numbers" is based upon to the effects of the proposed stocking program and is not
 36 reliant upon successful natural reproduction post-project?

37 Follow-up question #2 for CEC-IR-029. Could KHLP indicate if there are examples of
38 creation of young-of-the-year (nursery) habitat for lake sturgeon and, if there are,
39 whether or not they were successful?

40 **RESPONSE:**

41 The Aquatic Environment Supporting Volume (p.6-48) states:

42 "There is low to moderate certainty regarding the success of mitigation
43 measures to create YOY habitat in the reservoir and moderate certainty
44 regarding the success of mitigation measures to create spawning habitat in the
45 reservoir and Stephens Lake. However, there is moderate to high certainty
46 regarding effects to abundance following the implementation of a stocking
47 program, resulting in an overall moderate to high certainty for the predicted
48 increases in regional lake sturgeon numbers."

49 In response to the follow-up question #1, the overall moderate to high certainty for
50 predicted increases in regional sturgeon abundance is based on the effects of the
51 proposed stocking program and is not reliant upon successful natural reproduction post-
52 Project at the Project site. As discussed in the AE SV (p. 6-46), in addition to stocking at
53 the Project site, Lake Sturgeon will be stocked at off-site locations that currently provide
54 habitat to support all life history functions where the current small populations are
55 limiting the potential for recovery. Candidate sites have been identified in the upper
56 Split Lake area (i.e., in the Nelson River below the Kelsey GS, the Grass River, and the
57 Burntwood River downstream of First Rapids). Natural reproduction has been confirmed
58 at First Rapids in the Burntwood River and may occur at historic spawning locations in
59 the Nelson River downstream of the Kelsey GS and in the Grass River.

60 The long-term goal of the stocking program is to establish self-sustaining populations
61 that are not reliant on stocking in perpetuity. The goal of habitat mitigation in the
62 reservoir and at the generating station site is to provide habitat to support all life history
63 stages of Lake Sturgeon such that a self-sustaining population can be
64 maintained/established. However, given the uncertainty with respect to the design of
65 suitable habitat, modifications may be required before the habitat becomes fully
66 functional, increasing the importance of stocking as a means of supporting/enhancing
67 populations in the short term.

68 In response to follow-up question #2, there are no examples of creation of young-of-
69 the-year (nursery) habitat for Lake Sturgeon. For this reason, there is low to moderate
70 certainty regarding the success of mitigation measures to create such habitat.

71 Information on the ecology and habitat requirements of YOY lake sturgeon is limited
72 compared to that available for older fish, likely due to the difficulty of capturing young
73 Lake Sturgeon. As discussed in TAC Public Rd 1 DFO-0020, the capture of YOY Lake

74 Sturgeon in the Nelson River in Gull Lake is an important finding as these are the first
75 recorded captures of YOY Lake Sturgeon in the Nelson River, and among the first
76 recorded from a large river. Data on the habitat preferences, growth, and survival of
77 YOY or young Lake Sturgeon in large rivers is virtually non-existent in the scientific
78 literature. For this reason, effects to this life stage have not been well documented and,
79 to the best of our knowledge, habitat creation for this life stage has not been attempted
80 at other locations. This uncertainty is being addressed through the provision of an
81 alternate mitigation measure (stocking) and monitoring to determine whether created
82 habitat is functioning as intended with the provision to identify and implement
83 modifications, if required.

1 **REFERENCE: Volume: Aquatic Environment Supporting Volume;**
2 **Section: 6.0 Lake Sturgeon; Page No.: 6-38**

3 **CEC Rd 2 CEC-0099**

4 **ORIGINAL PREAMBLE AND QUESTION (CEC-0030):**

5 In this section it is indicated that Lake Sturgeon have been found to limit their
6 movements to relatively short reaches of river even in the absence of physical barriers
7 (READ APPENDIX 6A). Please confirm if this is the intended interpretation?

8 **FOLLOW-UP QUESTION:**

9 We understand new information in Response to this IR is coming in early August. We
10 will wait for new information before considering closing this IR.

11 **RESPONSE:**

12 Information is provided in the attachment "Adult Lake Sturgeon Movements in the Clark
13 Lake to Kettle Generating Station Reach of the Nelson River" included on the CD of
14 technical reports with this submission.

1 **REFERENCE: Volume: Aquatic Environment Supporting Volume;**
2 **Section: 6.0 Lake Sturgeon; Page No.: N/A**

3 **CEC Rd 2 CEC-0100**

4 **ORIGINAL PREAMBLE AND QUESTION (CEC-0031):**

5 It is indicated in Appendix 1A- Part 2, page 1 of the Aquatic Supporting Volume that the
6 stocking of Lake Sturgeon is a proven method for increasing numbers and has been an
7 important feature of many recovery plans. It is our opinion that this is likely only true
8 where the habitat still exists and the decline was due to overfishing or pollution that has
9 been rectified. We are not aware that this has been used as a proven mitigation method
10 relative to hydroelectric development. Is there documentation to support this
11 statement (i.e. can KHLP provide more details on where stocking has been used in
12 hydroelectric offsets)? Appendix 1 refers to stocking initiatives but none seem to be
13 directed towards hydroelectric plants, and most are short term initiatives (usually less
14 than 10 years not 25 years as proposed by KHLP).

15 A concern is expressed that stocking should be the last mitigation option and not the
16 first. A typical "Impact Management Hierarchy" would suggest that a sequential
17 approach would first try to avoid impacts (through re-location or re-design of the
18 project) and where this is not feasible, to mitigate impacts (through use of best available
19 technology and practicable mitigation measures). Failing the availability of measures to
20 mitigate impacts, the last resort is to offset the residual impacts through replacement of
21 the natural capital that is damaged or lost as a result of the development project. It is
22 felt that KHLP should consider Best Available Technology (BAT) for fish protection as
23 part of the EIS.

24 A concern is expressed that there should have been more consideration paid to both
25 upstream and downstream fish passage technology and approaches especially for
26 sturgeon. Recent work conducted in the US on diverting downstream migrating
27 sturgeon (e.g., angled bar or trash racks) by the Alden Labs (e.g., Amaral 2008), and on
28 upstream passage at the Conte Labs (e.g., Kynard et al. 2012) are not discussed.
29 Furthermore, recent efforts by the USFWS on both upstream and downstream fish
30 passage facilities for two hydro facilities in WI are also not referenced nor discussed
31 (Utrup 2011). Both upstream and downstream systems proposed have been approved
32 for implementation for Lake Sturgeon protection in WI by the Federal Energy Regulatory
33 Commission (FERC). It is felt that protection options should be considered as part of this
34 EIS rather than a follow-up program after the facility is constructed given the current
35 status of Lake Sturgeon and potential cumulative effects issue which is discussed below.
36 If a simple bypass structure and technology such as angled screens are not considered

37 during the planning stage it may be too costly to install after the facility is constructed.
 38 The concern is a fragmented population of Lake Sturgeon on the Nelson River.
 39 Therefore, it is requested that KHLP provide some further analysis as to the feasibility
 40 and efficacy of fish passage technologies. A concern is expressed Recovery means re-
 41 establishing a self-sustaining population, and stocking in the absence of suitable habitat
 42 will not achieve that.

43 **REFERENCES:**

44 Amaral, S., Taft, N. and D. Dixon. 2008. The Use of Angled Bar Racks and Louvers for
 45 Protecting Fish at Intakes. Presentation. A Symposium on Cooling Water Intake
 46 Technologies to Protect Aquatic Organisms. Available at:
 47 [http://water.epa.gov/lawsregs/lawguidance/cwa/316b/upload/2008_06_10_3](http://water.epa.gov/lawsregs/lawguidance/cwa/316b/upload/2008_06_10_316b_meetings_symposium_amaral.pdf)
 48 [16b_meetings_symposium_amaral.pdf](http://water.epa.gov/lawsregs/lawguidance/cwa/316b/upload/2008_06_10_316b_meetings_symposium_amaral.pdf).

49 Kynard, B., Pugh, D. and T. Parker 2012. Passage and Behaviour of Cultured Lake
 50 Sturgeon in a Prototype Side-Baffle Fish Ladder: I.Ladder hydraulics and fish
 51 ascent. *Journal of Applied Ichthyology* 27(Suppl. 2):77-88.

52 Utrup, 2011. (USFWS contact). Final Environmental Assessment. Proposed Upstream
 53 and Downstream Fish Passage for Lake Sturgeon at Menominee River in the
 54 Cities of Marinette Wisconsin and Menominee Michigan. Prepared for US
 55 Department of Interior by NEW Hydro. WI.

56 **FOLLOW-UP QUESTION:**

57 There is a need to consider downstream fish passage facilities in the design stage
 58 including a fish bypass. It is indicated that the "best approach to downstream fish
 59 passage would be through the turbines (and spillway when in operation)" - pg 17 par 4
 60 line 6. Need to consider not only turbine passage but also spillway and tailrace
 61 mortality. In addition to blade strike calculations, need to consider mortality associated
 62 with barotrauma related injuries. Use mortality injury simulation statistics developed by
 63 Brown et al. 2012 (*Trans American Fisheries Society* 141: 147-151) as an example.

64 **RESPONSE:**

65 As noted in the reponse to CEC Rd 1 CEC-0031, Manitoba Hydro and its fish passage
 66 consultants assessed existing downstream fish passage methods for their feasibility and
 67 likelihood of success. The study concluded that as a result of high uncertainty associated
 68 with the success of current downstream passage options, and because the Keeyask
 69 turbine designs had been modified to reduce mortality rates of fish passing through
 70 them, the best available approach to downstream fish passage would be through the
 71 turbines (and spillway, when in operation). Please see the response to CEC Rd 2 CEC-
 72 0091 for a discussion of why a downstream bypass is not an option for the Keeyask GS,
 73 though other methods of downstream passage are available, if required.

74 As discussed in the AE SV, the estimated survival rate of fish up to 500 mm in length
 75 during passage through turbines with design specifications for the proposed Keeyask
 76 turbines is greater than 90%. This estimate is based on the Franke formula, which
 77 addresses injury due to blade strikes; mechanical damage is the primary cause for fish
 78 injury/mortality passing through low head (<30 m) hydro facilities similar to the Keeyask
 79 GS (18 m head).

80 With respect to adverse effects related to pressure changes during passage through the
 81 turbines, tests with surface acclimated fish have shown little effect of pressure changes
 82 during turbine passage:

83 *"Although thousands of HI-Z tagged fish have been passed through turbines with a wide
 84 range of nadirs very few (<1%) of the recaptured fish have displayed injuries that could
 85 be attributed to sudden decompression trauma. Because the HI-Z tagged fish are held in
 86 water less than 40 cm deep prior to turbine passage these test fish are not acclimated to
 87 depths that a portion of naturally entrained fish would be. However, it has been very
 88 obvious from the HI-Z tag tests that there is little evidence that a sudden increase or
 89 decrease in pressure has any substantial negative effects on near surface acclimated
 90 fish..... Based on the parameters of the selected turbine design, it is anticipated that fish
 91 passing through the Keeyask GS turbines will be not be exposed to sudden increases or
 92 decreases in pressure that would have substantial negative effects on the fish."* (AE SV
 93 Appendix 1A Attachment 1).

94 The tailrace configuration at the Keeyask GS has not been studied specifically to
 95 determine whether substantial mortality would be expected as fish pass through it.
 96 Predation is a risk when fish are disoriented after passage through a generating station.
 97 During an assessment of turbine passage conducted at the Kelsey GS, control fish were
 98 released directly into the tailrace. Minimal mortality was recorded for these fish (it
 99 should be noted that they were subject to handling and implantation of HI-Z tags in
 100 addition to passage through the tailrace).

101 Mortality during passage over the spillway is not expected to be substantial at the
 102 Keeyask GS. As stated in the AE SV (Section 5.4.2.3.7, p. 5-63):

103 *"Passage through the spillway is not expected to result in greater mortality or injury
 104 than currently occurs for fish moving downstream past Gull Rapids because the spillway
 105 channel will follow the old riverbed and not have any sudden drops, plunge pools, or
 106 barriers. Fish could become stranded in isolated pools that may form in portions of the
 107 south channel of Gull Rapids after the spillway ceases operation (Section 3.4.2.3). To
 108 mitigate this effect, channels will be excavated to connect the pools to Stephens Lake to
 109 prevent fish stranding when water is not passed through the spillway (Appendix 1A)."*

110 Pressure changes experienced by fish during passage by the spillway are not expected to
111 cause injury/mortality to a substantial portion of the fish moving downstream for the
112 following reasons:

- 113 · At Full Supply Level, the depth of water at the spillway entrance will be 14.5 m.
114 Most of the fish in the study area (with the exception of Lake Sturgeon) will be
115 distributed throughout the water column and so few will be acclimated to the
116 higher pressure at the bottom.
- 117 · Spillway flow will quickly carry fish from the spillway gate, over the steep portion of
118 the river channel (present day Gull Rapids) to deeper waters in the Nelson River
119 channel (4-8 m depth and rapidly increasing to 8-12 metres) providing fish with
120 deeper water in close proximity to the spillway.
- 121 · Physoclistous fish are typically affected to a greater degree than physostomous fish.
122 Of the four VEC fish species, only walleye are physoclistous.

123 In addition to the above-stated points, it should be noted that no evidence of
124 barotrauma following spillway passage has been reported at any Manitoba Hydro
125 facility. The reviewer suggested that the Partnership consider the methods employed by
126 Brown et al. (2012) to obtain an estimate of potential mortality due to barotrauma. This
127 paper was reviewed, but given that it was applied to turbine effects on Chinook salmon,
128 it did not appear to be applicable to an assessment of the spillway at Keeyask. However,
129 Manitoba Hydro recognizes the growing concern regarding barotrauma and, as such, is
130 considering the conduct of a barotrauma study at one of its existing plants.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 7.3**
2 **Past, Current and Future Projects and Activities; Page No.: N/A**

3 **CEC Rd 2 CEC-0101a**

4 **ORIGINAL PREAMBLE AND QUESTION (CEC-0020):**

5 Identification of Past, Current and Future Projects and Activities

6 Attachment E of the Scoping Document for the EA of the Keeyask Generation Project
7 provides a list of past, current and future projects and activities for the cumulative
8 effects assessment (CEA):

9 *“The following are past and current (i.e., ongoing) projects and activities to be*
10 *considered in the cumulative effects assessment:*

- 11 *• Manitoba Hydro generation-related developments in the North:*
- 12 *• Churchill River Diversion o Lake Winnipeg Regulation*
 - 13 *• Jenpeg, Kelsey, Kettle, Long Spruce, Limestone and Wuskwatin Generating*
14 *Stations o Kelsey re-running*
 - 15 *• Keeyask Infrastructure Project*
 - 16 *• Linear development in the region (i.e., transmission lines and highways,*
17 *including upgrades to PR 280)*
 - 18 *• Mining (e.g., Vale)*
 - 19 *• Commercial forestry*
 - 20 *• Commercial fishing of sturgeon*
 - 21 *• Other agents of change as may be identified in the assessment of specific VECs*

22 *The following are future projects to be considered in the cumulative effects*
23 *assessment:*

- 24 *• Gillam redevelopment*
- 25 *• Bipole III Transmission*
- 26 *• Keeyask Transmission Project*
- 27 *• Conawapa Generation Project”*

28 In Section 9.8 “Cumulative Environmental Effects” of the Canadian Environmental
29 Assessment Agency’s Draft EIS Guidelines for the Keeyask Generation Project document,
30 it is stated that:

31 *“The proponent shall provide a map that shows all the past, present and future*
 32 *projects it has considered in the cumulative effects assessment.”*

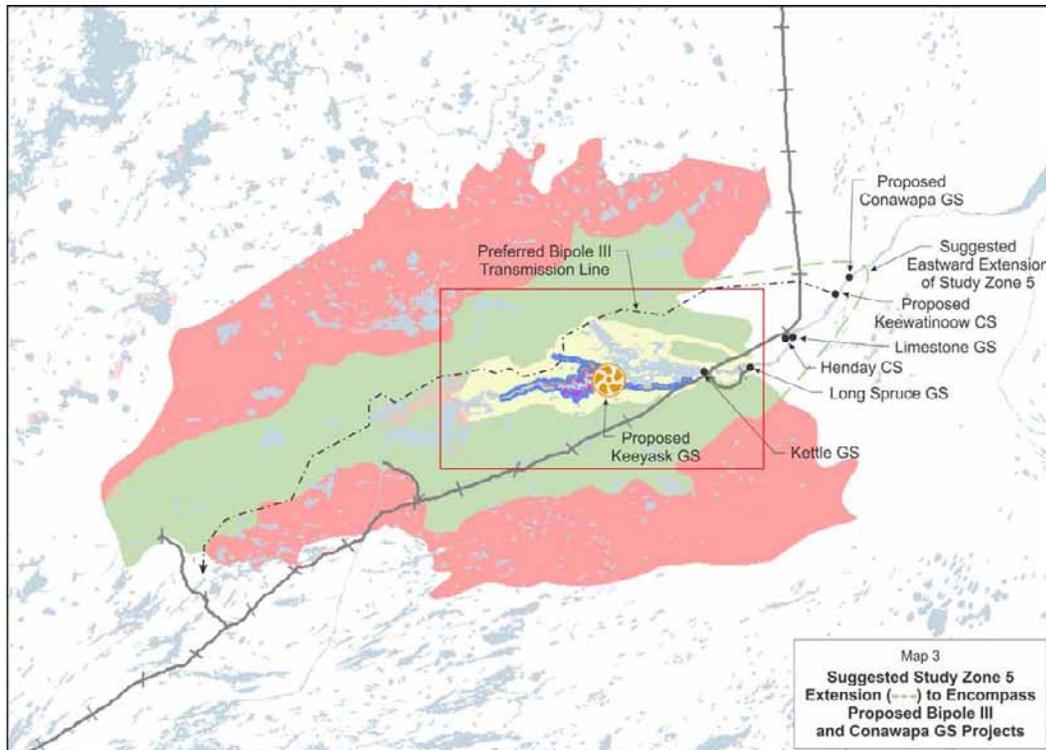
33 Mapping is provided in Section 7.0 “Cumulative Effects Assessment” in the Keeyask EIS
 34 Map and Figure Folio and includes:

- 35 · Hydro Development in Northern Manitoba (locations of proposed and existing
 36 projects);
- 37 · Wuskwatim Transmission Project;
- 38 · Manitoba Hydro Transmission Line Network;
- 39 · Keeyask Infrastructure Project Site;
- 40 · Provincial Road 280 Upgrade;
- 41 · Northern Extents of Bipole III Transmission Project;
- 42 · Keeyask Construction Power Project: Preliminary Transmission Corridors During
 43 Construction; and
- 44 · Keeyask Construction Power Project: Preliminary Transmission Corridors During
 45 Operation.

46 Map 7A-6 “Northern Extents of Bipole III Transmission Project” only shows the locations
 47 the Keewatinoow Converter Station (CS) and the Bipole III Transmission Line (Final
 48 Preferred Route). There is no indication of other proposed Bipole III Project
 49 components, e.g., Keewatinoow Ground Electrode Site, Ground Electrode Line, five AC
 50 collector lines from Henday CS to the Keewatinoow CS, etc. (see Section 2.0).

51 A map should be provided indicating the locations of all proposed Bipole III Project
 52 components, as well as the proposed Conawapa Generating Station (GS) and its likely
 53 project components.

54 Note: The revised map provided by KHLP did not include all of the items identified
 55 above. A suggest study zone is shown below.



56

57 **FOLLOW-UP QUESTION:**

58 KHLP provided a consolidated Keeyask Generation Project Cumulative Effects Map. A
 59 separate document "Cumulative Effects Assessment Summary" was also provided which
 60 summarizes the findings of the cumulative effects assessment for the Keeyask
 61 Generation Project.

62 In all of the terrestrial VEC sections in the "Cumulative Effects Assessment Summary" a
 63 table with the heading "Interaction with Future Projects/Activities" includes "Bipole III"
 64 and "Conawapa" as future projects/activities. This is misleading. As "Bipole III" could be
 65 interpreted as representing all of the Bipole III Transmission Project (including the
 66 Keewatinoow CS project components), it should be revised to "Bipole III Transmission
 67 ROW". Moreover, as "Conawapa" is outside of the Regional Study Areas (Study Zones 4,
 68 5 and 6 depending upon the VEC) and was not considered in the cumulative effects
 69 assessment, it should be deleted from each section of this version of the "Cumulative
 70 Effects Assessment Summary". However, see Follow-up to CEC-IR-022, which requests
 71 KHLP to expand Study Zones 4 and 5 to encompass all past, current and future
 72 developments further east up to and including Conawapa.

73 **RESPONSE:**

74 The tables are not misleading. The column titles fairly represent what was considered
 75 for the VEC assessments.

76 As described in the response to CEC Rd 1 CEC-0021 and detailed for terrestrial VECs in
77 the response to CEC Rd 1 CEC-0022, effects on terrestrial VECs (as well as on other VECs)
78 from all components of the Bipole III Transmission Project (including Keewatinoow CS
79 project components) and the Conawapa Generation Project were considered to the
80 extent that effects from these projects are expected to have spatial and temporal
81 overlap with Project and cumulative effects on these VECs. As examples, wildlife
82 mortality and sensory disturbances to caribou related to construction traffic from the
83 Bipole III Transmission and Conawapa Generation Projects are considered in the
84 cumulative effects assessment for Keeyask.

85 Please see response to CEC Rd 2 CEC-0103a for details regarding the response to follow-
86 up questions regarding CEC Rd 1 CEC-0022.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 7.3**
2 **Past, Current and Future Projects and Activities; Page No.: N/A**

3 **CEC Rd 2 CEC-0101b**

4 **ORIGINAL PREAMBLE AND QUESTION (CEC-0020):**

5 Identification of Past, Current and Future Projects and Activities

6 Attachment E of the Scoping Document for the EA of the Keeyask Generation Project
7 provides a list of past, current and future projects and activities for the cumulative
8 effects assessment (CEA):

9 *“The following are past and current (i.e., ongoing) projects and activities to be*
10 *considered in the cumulative effects assessment:*

- 11 • *Manitoba Hydro generation-related developments in the North:*
- 12 • *Churchill River Diversion o Lake Winnipeg Regulation*
 - 13 • *Jenpeg, Kelsey, Kettle, Long Spruce, Limestone and Wuskwatin Generating*
 - 14 *Stations o Kelsey re-running*
 - 15 • *Keeyask Infrastructure Project*
 - 16 • *Linear development in the region (i.e., transmission lines and highways,*
 - 17 *including upgrades to PR 280)*
 - 18 • *Mining (e.g., Vale)*
 - 19 • *Commercial forestry*
 - 20 • *Commercial fishing of sturgeon*
 - 21 • *Other agents of change as may be identified in the assessment of specific VECs*

22 *The following are future projects to be considered in the cumulative effects*
23 *assessment:*

- 24 • *Gillam redevelopment*
- 25 • *Bipole III Transmission*
- 26 • *Keeyask Transmission Project*
- 27 • *Conawapa Generation Project”*

28 In Section 9.8 “Cumulative Environmental Effects” of the Canadian Environmental
29 Assessment Agency’s Draft EIS Guidelines for the Keeyask Generation Project document,
30 it is stated that:

31 *"The proponent shall provide a map that shows all the past, present and future*
 32 *projects it has considered in the cumulative effects assessment."*

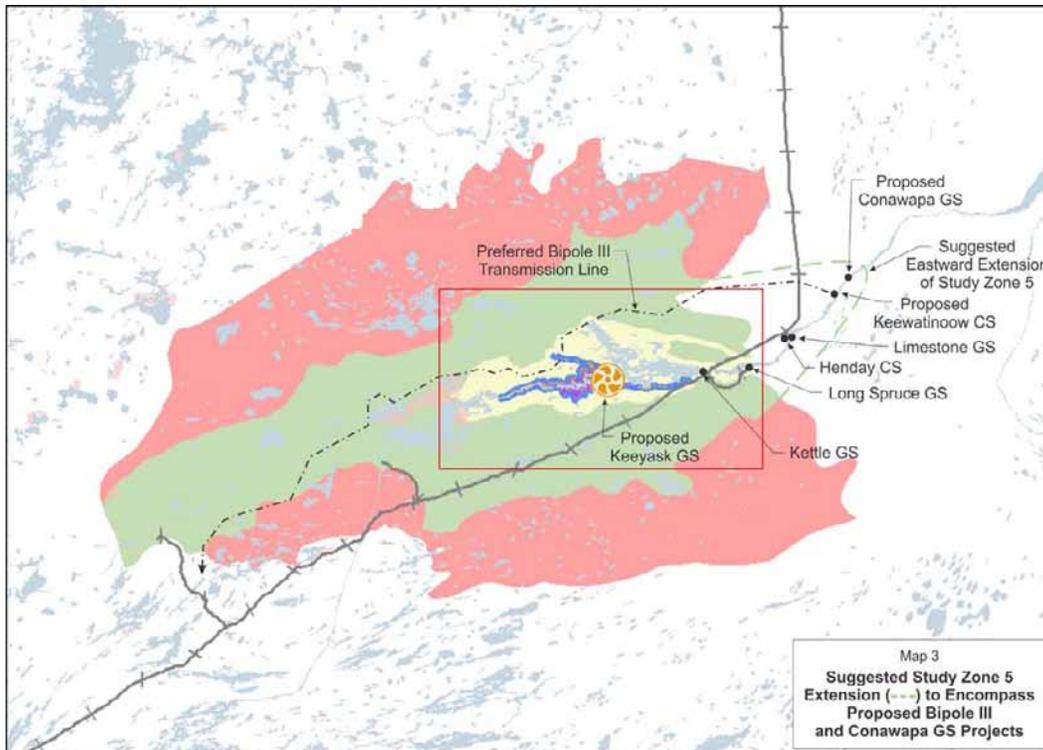
33 Mapping is provided in Section 7.0 "Cumulative Effects Assessment" in the Keeyask EIS
 34 Map and Figure Folio and includes:

- 35 • Hydro Development in Northern Manitoba (locations of proposed and existing
 36 projects);
- 37 • Wuskwatim Transmission Project;
- 38 • Manitoba Hydro Transmission Line Network;
- 39 • Keeyask Infrastructure Project Site;
- 40 • Provincial Road 280 Upgrade;
- 41 • Northern Extents of Bipole III Transmission Project;
- 42 • Keeyask Construction Power Project: Preliminary Transmission Corridors During
 43 Construction; and
- 44 • Keeyask Construction Power Project: Preliminary Transmission Corridors During
 45 Operation.

46 Map 7A-6 "Northern Extents of Bipole III Transmission Project" only shows the locations
 47 the Keewatinoow Converter Station (CS) and the Bipole III Transmission Line (Final
 48 Preferred Route). There is no indication of other proposed Bipole III Project
 49 components, e.g., Keewatinoow Ground Electrode Site, Ground Electrode Line, five AC
 50 collector lines from Henday CS to the Keewatinoow CS, etc. (see Section 2.0).

51 A map should be provided indicating the locations of all proposed Bipole III Project
 52 components, as well as the proposed Conawapa Generating Station (GS) and its likely
 53 project components.

54 Note: The revised map provided by KHLP did not include all of the items identified
 55 above. A suggest study zone is shown below.



56

57 **FOLLOW-UP QUESTION:**

58 KHLP provided a consolidated Keeyask Generation Project Cumulative Effects Map. A
59 separate document "Cumulative Effects Assessment Summary" was also provided which
60 summarizes the findings of the cumulative effects assessment for the Keeyask
61 Generation Project.

62 In the Ecosystem Diversity section of the "Cumulative Effects Assessment Summary", it
63 is stated that "effects on the amounts of priority habitat affected were considered to be
64 regionally acceptable if they were less than 10% of the pre-development area for the
65 habitat type". It is further stated that based on the anticipated locations of the future
66 projects, cumulative area losses for all priority habitat types are expected to remain
67 below 10% of pre-development area". There is no indication that the cumulative loss of
68 the priority habitat type "balsam poplar dominant on all ecosites" will be 9.9% of Study
69 Zone 5, whereas 8.8% of two other priority habitat types will also be lost. Why was this
70 information not presented?

71 **RESPONSE:**

72 The "Cumulative Effects Assessment Summary" is a very brief presentation of the
73 cumulative effects assessment for each VEC. The cumulative effects assessment
74 conclusion section does not provide details for individual priority habitat types because
75 cumulative effects for all types are below the 10% benchmark (it is noted that the cited
76 percentages are reported in Table 1 of the response to CEC Rd 1 CEC-0021).

77 Additionally, the fact that three priority habitat types have percentages of area affected
78 that approach 10% does not indicate a high degree of concern for these habitat types
79 for the two reasons that follow.

80 First, as described in the response to CEC Rd 1 MB Wildlands-0074, the 10% value is
81 used as a benchmark for when an effect is considered more seriously in conjunction
82 with other factors (effect duration, ecological context) and other indicator measures. It
83 is not a threshold where dramatic consequences on ecosystem diversity are expected to
84 occur.

85 Second, as noted in the EIS and in the response to CEC Rd 1 MB Wildlands-0034, the
86 total areas of affected habitat are understood to be precautionary overestimates. Actual
87 Project effects on the priority habitat types are expected to be lower than predicted
88 because some of the potential Project Footprint areas will not actually be used (see
89 response to CEC Rd 1 MB Wildlands-0034 for details), and because the terrestrial habitat
90 assessment cautiously assumes that all areas within 50 m of the Project Footprint will be
91 indirectly affected even though evidence from studies indicates that indirect effects
92 generally extend a lesser distance (see response to CEC Rd 1 PFN-0038).

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 7.3**
2 **Past, Current and Future Projects and Activities; Page No.: N/A**

3 **CEC Rd 2 CEC-0101c**

4 **ORIGINAL PREAMBLE AND QUESTION (CEC-0020):**

5 Identification of Past, Current and Future Projects and Activities

6 Attachment E of the Scoping Document for the EA of the Keeyask Generation Project
7 provides a list of past, current and future projects and activities for the cumulative
8 effects assessment (CEA):

9 *“The following are past and current (i.e., ongoing) projects and activities to be*
10 *considered in the cumulative effects assessment:*

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 - 13 • *Jenpeg, Kelsey, Kettle, Long Spruce, Limestone and Wuskwatin Generating*
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 - 16 • *Linear development in the region (i.e., transmission lines and highways,*
 - 17 *including upgrades to PR 280)*
 - 18 • *Mining (e.g., Vale)*
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 - 20 • *Commercial fishing of sturgeon*
 - 21 • *Other agents of change as may be identified in the assessment of specific VECs*

22 *The following are future projects to be considered in the cumulative effects*
23 *assessment:*

- 24 • *Gillam redevelopment*
- 25 • *Bipole III Transmission*
- 26 • *Keeyask Transmission Project*
- 27 • *Conawapa Generation Project”*

28 In Section 9.8 “Cumulative Environmental Effects” of the Canadian Environmental
29 Assessment Agency’s Draft EIS Guidelines for the Keeyask Generation Project document,
30 it is stated that:

31 *“The proponent shall provide a map that shows all the past, present and future*
 32 *projects it has considered in the cumulative effects assessment.”*

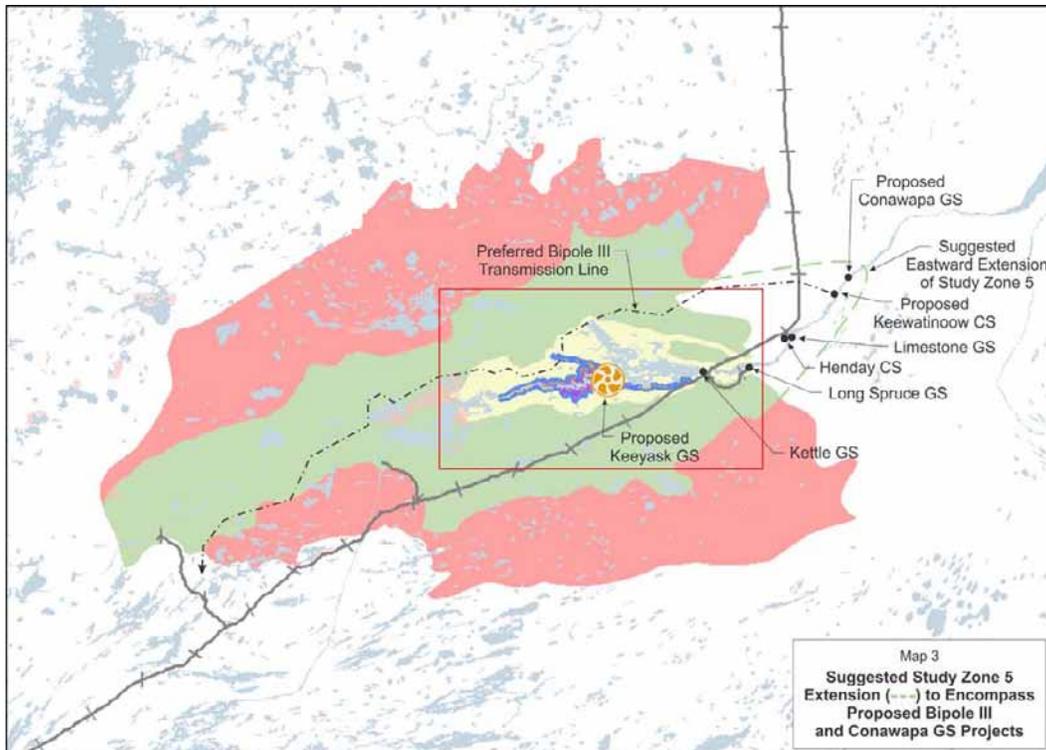
33 Mapping is provided in Section 7.0 “Cumulative Effects Assessment” in the Keeyask EIS
 34 Map and Figure Folio and includes:

- 35 · Hydro Development in Northern Manitoba (locations of proposed and existing
- 36 projects);
- 37 · Wuskwatim Transmission Project;
- 38 · Manitoba Hydro Transmission Line Network;
- 39 · Keeyask Infrastructure Project Site;
- 40 · Provincial Road 280 Upgrade;
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- 43 Construction; and
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- 45 Operation.

46 Map 7A-6 “Northern Extents of Bipole III Transmission Project” only shows the locations
 47 the Keewatinoow Converter Station (CS) and the Bipole III Transmission Line (Final
 48 Preferred Route). There is no indication of other proposed Bipole III Project
 49 components, e.g., Keewatinoow Ground Electrode Site, Ground Electrode Line, five AC
 50 collector lines from Henday CS to the Keewatinoow CS, etc. (see Section 2.0).

51 A map should be provided indicating the locations of all proposed Bipole III Project
 52 components, as well as the proposed Conawapa Generating Station (GS) and its likely
 53 project components.

54 Note: The revised map provided by KHLP did not include all of the items identified
 55 above. A suggest study zone is shown below.



56

57 **FOLLOW-UP QUESTION:**

58 In the Rusty Blackbird section, it is stated that this migratory bird “was selected as a VEC
 59 primarily because it is listed as threatened under the federal Species at Risk Act.”
 60 According to http://www.sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=907 Rusty
 61 Blackbird is listed as Special Concern under the federal Species at Risk Act not
 62 Threatened.

63 **RESPONSE:**

64 In the Response to EIS Guidelines (Section 6.2.3.4.6, Table 6-10) and in the TE SV Section
 65 6.3.2.4.5, rusty blackbird is described as being listed as ‘special concern’ under the
 66 federal Species at Risk Act (SARA). Rusty blackbird was inadvertently described as being
 67 listed as ‘threatened’ in the response to CEC Rd 1 CEC-0020.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 7.5.2**
 2 **Terrestrial Environment; Page No.: N/A**

3 **CEC Rd 2 CEC-0102a**

4 **ORIGINAL PREAMBLE AND QUESTION (CEC-0021):**

5 A quantitative residual effects assessment for the Local Study Areas was not provided
 6 for some of the VECs and supporting topics. Eastern expansion of the Study Zone 5
 7 Regional Study Area will not affect the EA findings for the Local Study Areas (generally
 8 Study Zone 3, but Study Zone 2 for Terrestrial Habitat, Ecosystem Diversity, Soil Quantity
 9 and Quality, Wetland Function, Priority Plants and Invasive Plants).

10 For example, it is stated in Section 2.6.4.1.1 of the Terrestrial Environment Supporting
 11 Volume that the "Project Footprint could remove or alter up to 6,872 ha, or 0.6%, of
 12 terrestrial habitat during construction, but this could increase to 6,952 ha if borrow area
 13 E-1 is used", or 0.7% of terrestrial habitat in the Regional Study Area (Study Zone 5 with
 14 area of 1,240,000 ha). Although not mentioned in Section 2.6.4.1.1, this loss of habitat
 15 areas with or without the use of borrow area E-1 would represent approximately 53% of
 16 the Local Study Area (Study Zone 2 with area of 13,043 ha).

17 No data on percentage of core areas to be lost were provided for the Local Study Area.
 18 Rather, it was indicated in Section 2.4.4.1.1 that the number of core areas at least 200
 19 ha in size that overlap the Local Study Area would decline from 13 to 12 and their
 20 combined area would decline from 115,308 ha to 106,754 ha. This is a decline of 7.4%,
 21 and would likely be significantly higher if only the areas of the core areas within the
 22 Local Study Area are taken into consideration.

23 As stated in Section 6.5.3.3.1 "Construction Effects and Mitigation" of the Keeyask
 24 Generation Project EIS Response to EIS Guidelines, "the total number of core areas
 25 larger than 200 ha in the Regional Study Area is predicted to remain at 111 because,
 26 although a few core areas are completely removed, several other core areas are
 27 fragmented into smaller blocks. The total number of core areas larger than 1,000 ha
 28 would be reduced by one. None of the very large core areas would be lost."

29 As stated in the Terrestrial Environment Supporting Volume (p. 2-120), "Project
 30 construction would have localized core area effects, primarily resulting from reservoir
 31 clearing, dyke construction and coffer dam diversion. One core area slightly larger than
 32 1,000 ha and two core areas between 200 ha and 1,000 ha would be removed. In
 33 addition, several larger core areas on the north and south sides of the Nelson River
 34 would become smaller (Map 2-15). One of these latter core areas is on Caribou Island
 35 and is the largest core area on an island in the Keeyask reach of the Nelson River. The

36 largest core area along the north side of the Nelson River would be reduced by 879 ha,
37 or 36%."

38 The total losses of core areas may not be significant within the Regional Study Area, but
39 may be within the Local Study Area. However, no data are provided on percentage of
40 total core area to be lost within the Local Study Area.

41 A quantitative residual effects assessment of each project component, e.g., reservoir
42 clearing, dyke construction, coffer dam diversion, permanent and temporary
43 infrastructure footprints, reservoir inundation, for the Local Study Area in tabular form
44 and/or mapping, as appropriate, should be provided for each of the key topics:

- 45 • Intactness based on linear feature density (km/km²) and core area abundance
46 (number and ha);
- 47 • Terrestrial Habitat based on loss or alteration of terrestrial habitat (ha);
- 48 • Ecosystem Diversity based on loss or alteration of the 43 priority habitat types
49 (number and ha);
- 50 • Wetland Function based on loss, creation or alteration of shoreline wetlands, off-
51 system marsh and other wetland types (ha);
- 52 • Mallard based on loss of habitat and reduction of staging habitat quality (ha);
- 53 • Bald Eagle based on habitat alteration and loss of nests and perching trees (ha and
54 number);
- 55 • Olive-sided Flycatcher based on habitat loss (ha);
- 56 • Rusty Blackbird based on habitat loss (ha);
- 57 • Common Nighthawk based on habitat loss/gain (ha);
- 58 • Yellow Rail based on habitat loss (ha);
- 59 • Short-eared Owl based on habitat loss (ha);
- 60 • Beaver based on habitat loss (ha), colony removal (number) and improved trapping
61 access;
- 62 • Caribou based on loss of significant caribou habitat, and relative to cumulative
63 effects of Intactness, Terrestrial Habitat and Ecosystem Diversity;
- 64 • Moose due to habitat loss and alteration (ha) and increased hunting access; and
- 65 • American Marten based on habitat loss (ha) and Intactness.

66 **FOLLOW-UP QUESTION:**

67 Please confirm that the major columns with the headings of "Keeyask & past, current &
68 potential future projects Regional Study Area" in Tables 1 and 3, and the heading of
69 "Keeyask & Past, Current and Future Projects" in Table 2, provide data for the portion of
70 the Bipole III transmission right-of-way within the regional study area (Study Zones 4, 5
71 or 6, depending on the VEC), Gillam Redevelopment and Keeyask Transmission Project
72 as all future projects, in addition to the Keeyask Generation Project.

73 **RESPONSE:**

74 Yes, the columns referred to in the question provide data for the portion of the Bipole III
75 transmission right-of-way within the regional study area (i.e., Study Zones 4, 5 or 6,
76 depending on the VEC), Gillam Redevelopment and Keeyask Transmission Project, in
77 addition to the Keeyask Generation Project. For all quantitative indicators, the reported
78 values in this section of each table relate to the portion of the future project's physical
79 footprint (e.g., clearing, flooding) that is within the VEC's Regional Study Area. Other
80 types of effects from these projects are reported in the EIS (see response to CEC Rd 1
81 CEC-0021). Quantification of effects on bald eagle were not provided in these columns
82 as bald eagle was screened out of the future projects cumulative effects assessment due
83 to the conclusion of no residual operation effects (Response to EIS Guidelines Section
84 7.4, Table 7-3).

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 7.5.2**
 2 **Terrestrial Environment; Page No.: N/A**

3 **CEC Rd 2 CEC-0102b**

4 **ORIGINAL PREAMBLE AND QUESTION (CEC-0021):**

5 A quantitative residual effects assessment for the Local Study Areas was not provided
 6 for some of the VECs and supporting topics. Eastern expansion of the Study Zone 5
 7 Regional Study Area will not affect the EA findings for the Local Study Areas (generally
 8 Study Zone 3, but Study Zone 2 for Terrestrial Habitat, Ecosystem Diversity, Soil Quantity
 9 and Quality, Wetland Function, Priority Plants and Invasive Plants).

10 For example, it is stated in Section 2.6.4.1.1 of the Terrestrial Environment Supporting
 11 Volume that the "Project Footprint could remove or alter up to 6,872 ha, or 0.6%, of
 12 terrestrial habitat during construction, but this could increase to 6,952 ha if borrow area
 13 E-1 is used", or 0.7% of terrestrial habitat in the Regional Study Area (Study Zone 5 with
 14 area of 1,240,000 ha). Although not mentioned in Section 2.6.4.1.1, this loss of habitat
 15 areas with or without the use of borrow area E-1 would represent approximately 53% of
 16 the Local Study Area (Study Zone 2 with area of 13,043 ha).

17 No data on percentage of core areas to be lost were provided for the Local Study Area.
 18 Rather, it was indicated in Section 2.4.4.1.1 that the number of core areas at least 200
 19 ha in size that overlap the Local Study Area would decline from 13 to 12 and their
 20 combined area would decline from 115,308 ha to 106,754 ha. This is a decline of 7.4%,
 21 and would likely be significantly higher if only the areas of the core areas within the
 22 Local Study Area are taken into consideration.

23 As stated in Section 6.5.3.3.1 "Construction Effects and Mitigation" of the Keeyask
 24 Generation Project EIS Response to EIS Guidelines, "the total number of core areas
 25 larger than 200 ha in the Regional Study Area is predicted to remain at 111 because,
 26 although a few core areas are completely removed, several other core areas are
 27 fragmented into smaller blocks. The total number of core areas larger than 1,000 ha
 28 would be reduced by one. None of the very large core areas would be lost."

29 As stated in the Terrestrial Environment Supporting Volume (p. 2-120), "Project
 30 construction would have localized core area effects, primarily resulting from reservoir
 31 clearing, dyke construction and coffer dam diversion. One core area slightly larger than
 32 1,000 ha and two core areas between 200 ha and 1,000 ha would be removed. In
 33 addition, several larger core areas on the north and south sides of the Nelson River
 34 would become smaller (Map 2-15). One of these latter core areas is on Caribou Island
 35 and is the largest core area on an island in the Keeyask reach of the Nelson River. The

36 largest core area along the north side of the Nelson River would be reduced by 879 ha,
37 or 36%."

38 The total losses of core areas may not be significant within the Regional Study Area, but
39 may be within the Local Study Area. However, no data are provided on percentage of
40 total core area to be lost within the Local Study Area.

41 **FOLLOW-UP QUESTION:**

42 A quantitative residual effects assessment of each project component, e.g., reservoir
43 clearing, dyke construction, coffer dam diversion, permanent and temporary
44 infrastructure footprints, reservoir inundation, for the Local Study Area in tabular form
45 and/or mapping, as appropriate, should be provided for each of the key topics:

- 46 • Intactness based on linear feature density (km/km²) and core area abundance
47 (number and ha);
- 48 • Terrestrial Habitat based on loss or alteration of terrestrial habitat (ha);
- 49 • Ecosystem Diversity based on loss or alteration of the 43 priority habitat types
50 (number and ha);
- 51 • Wetland Function based on loss, creation or alteration of shoreline wetlands, off-
52 system marsh and other wetland types (ha);
- 53 • Mallard based on loss of habitat and reduction of staging habitat quality (ha);
- 54 • Bald Eagle based on habitat alteration and loss of nests and perching trees (ha and
55 number);
- 56 • Olive-sided Flycatcher based on habitat loss (ha);
- 57 • Rusty Blackbird based on habitat loss (ha);
- 58 • Common Nighthawk based on habitat loss/gain (ha);
- 59 • Yellow Rail based on habitat loss (ha);
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62 access;
- 63 • Caribou based on loss of significant caribou habitat, and relative to cumulative
64 effects of Intactness, Terrestrial Habitat and Ecosystem Diversity;
- 65 • Moose due to habitat loss and alteration (ha) and increased hunting access; and
- 66 • American Marten based on habitat loss (ha) and Intactness.

67 KHLP provided three Tables in response to CEC-IR-021:

- 68 • Table 1. Terrestrial Habitat and Ecosystem VECs: Habitat Affected by Keeyask and
69 Past, Present and Potential Future Projects;
- 70 • Table 2. Bird VECs: Habitat Available and Habitat Affected by Keeyask and Past,
71 Present and Potential Future Projects; and

72 • Table 3. Mammal VECs: Habitat Available and Habitat Affected by Keeyask and Past,
73 Present and Potential Future Projects.

74 For the Indicator Measure "total terrestrial habitat area (ha)" under the "Bipole III"
75 column, it is indicated that 3,700 ha will be affected. Footnote 5 states that habitat
76 composition for the portion of Bipole III outside of Study Zone 4 is estimated from Study
77 Zone 4 percentages. In Table 4 of the KHLP response to CEC-IR-035, it is indicated that
78 approximately 3,630 ha of terrestrial habitat will be affected by all of the Bipole III
79 Transmission Project within the Split Lake and Fox Lake Resource Management Areas.
80 This 3,630 ha area includes 1,584.13 ha of transmission line right-of-way (ROW), which
81 can be expected to be similar to the area of transmission line ROW within Study Zone 5.
82 Please clarify whether the 3,630 ha of total terrestrial habitat area represents the area
83 of Bipole III transmission line ROW within Study Zone 5, or the total area affected by the
84 Bipole III Transmission Project.

85 **RESPONSE:**

86 The similarity of the total areas found in the two tables is coincidental. The 3,700 ha
87 reported in Table 1 of the response to CEC Rd 1 CEC-0021 includes the portion of the
88 Bipole III footprint within Study Zone 5 (approximately 1,470 ha) plus a 50 m buffer of
89 this footprint to account for potential indirect effects on terrestrial habitat. The 3,630 ha
90 reported in Table 4 of the response to CEC Rd 1 CEC-0035 is the portion of the Bipole III
91 footprint that is within the Split Lake and Fox Lake Resource Management Areas. Please
92 also note that Table 4 of the response to CEC Rd 1 CEC-0035 is for total land area
93 whereas Table 1 of the response to CEC Rd 1 CEC-0021 is for the terrestrial habitat
94 portion of land area (some of the land area is existing human infrastructure).

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 7.5.2**
2 **Terrestrial Environment; Page No.: N/A**

3 **CEC Rd 2 CEC-0102c**

4 **ORIGINAL PREAMBLE AND QUESTION (CEC-0021):**

5 A quantitative residual effects assessment for the Local Study Areas was not provided
6 for some of the VECs and supporting topics. Eastern expansion of the Study Zone 5
7 Regional Study Area will not affect the EA findings for the Local Study Areas (generally
8 Study Zone 3, but Study Zone 2 for Terrestrial Habitat, Ecosystem Diversity, Soil Quantity
9 and Quality, Wetland Function, Priority Plants and Invasive Plants).

10 For example, it is stated in Section 2.6.4.1.1 of the Terrestrial Environment Supporting
11 Volume that the “Project Footprint could remove or alter up to 6,872 ha, or 0.6%, of
12 terrestrial habitat during construction, but this could increase to 6,952 ha if borrow area
13 E-1 is used”, or 0.7% of terrestrial habitat in the Regional Study Area (Study Zone 5 with
14 area of 1,240,000 ha). Although not mentioned in Section 2.6.4.1.1, this loss of habitat
15 areas with or without the use of borrow area E-1 would represent approximately 53% of
16 the Local Study Area (Study Zone 2 with area of 13,043 ha).

17 No data on percentage of core areas to be lost were provided for the Local Study Area.
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39 may be within the Local Study Area. However, no data are provided on percentage of
40 total core area to be lost within the Local Study Area.

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- 53 • Bald Eagle based on habitat alteration and loss of nests and perching trees (ha and
54 number);
- 55 • Olive-sided Flycatcher based on habitat loss (ha);
- 56 • Rusty Blackbird based on habitat loss (ha);
- 57 • Common Nighthawk based on habitat loss/gain (ha);
- 58 • Yellow Rail based on habitat loss (ha);
- 59 • Short-eared Owl based on habitat loss (ha);
- 60 • Beaver based on habitat loss (ha), colony removal (number) and improved trapping
61 access;
- 62 • Caribou based on loss of significant caribou habitat, and relative to cumulative
63 effects of Intactness, Terrestrial Habitat and Ecosystem Diversity;
- 64 • Moose due to habitat loss and alteration (ha) and increased hunting access; and
65 • American Marten based on habitat loss (ha) and Intactness.

66 FOLLOW-UP QUESTION

67 KHLF provided three Tables in response to CEC-IR-021:

- 68 • Table 1. Terrestrial Habitat and Ecosystem VECs: Habitat Affected by Keeyask and
69 Past, Present and Potential Future Projects;
- 70 • Table 2. Bird VECs: Habitat Available and Habitat Affected by Keeyask and Past,
71 Present and Potential Future Projects; and

72 • Table 3. Mammal VECs: Habitat Available and Habitat Affected by Keeyask and Past,
73 Present and Potential Future Projects.

74 Tables 2 and 3 are very confusing. Why were sub-columns with Conawapa and
75 Keewatinow headings included in the tables and in the case of Table 2 provided with
76 values of 0 ha implying that no bird VEC habitat will be affected?

77 Please complete the following simple table:

78 Total Available Pre-development Habitat in RSA Area can be estimated by using the
79 following formula:

80 • $\text{Habitat Currently Available in the RSA} \times \text{Total Pre-development Terrestrial Habitat}$
81 $(\text{e.g., } 167,255 \text{ ha for Study Zone 4}) \div \text{Total Terrestrial Habitat Lost due to Past \&}$
82 Current Projects.

83 In the Follow-up to CEC-IR-022, CEC requested KHLP to expand Study Zones 4 and 5 to
84 encompass all past, current and future developments located further east up to and
85 including Conawapa. Please include these developments in the preparation of the above
86 table.

87 In addition, please revise Table 1 to include these additional past, current and future
88 developments located further east up to and including Conawapa.

89 **RESPONSE:**

90 The sub-columns with Conawapa and Keewatinow headings were included in Tables 1 to
91 3 of the response to CEC Rd 1 CEC-0021 in order to indicate the effects of these projects
92 on the VEC indicator measures.

93 It is noted that in the case of Table 2, bald eagle was the only bird VEC for which habitat
94 affected by future projects totaled 0 ha. This value was reported because bald eagle was
95 screened out of the cumulative effects assessment with future projects due to neutral
96 Project effects (see section 7.5 of the Response to EIS Guidelines)

97 As reviewed below, attempting to estimate total pre-development VEC habitat using the
98 simple extrapolation requested in this follow-up question is misleading for some VEC
99 indicator measures. There also appears to be a typographical error in the formula
100 provided in the follow-up question for estimating Total Available Pre-development
101 Habitat in RSA Area. Based on the question, the formula to produce the requested
102 values in Table A below was assumed to have been intended to be as follows (with VEC
103 habitat being for RSA):

104 $\text{Current Available VEC Habitat} / \text{Current Total Terrestrial Habitat} \times \text{Pre-}$
105 $\text{Development Total Terrestrial Habitat} = \text{Pre-Development VEC Habitat}$

106 Table A below provides available habitat amounts for the wildlife VECs based on the
107 formula above relative to the Regional Study Area used for each VEC in the effects
108 assessment. Please see the responses to CEC Rd 2 CEC-0103a and CEC Rd 1 CEC-0021 for
109 the explanation as to how these habitat areas already capture the effects of other
110 projects on Keeyask VEC populations without expanding VEC Regional Study Areas
111 eastward past the proposed Conawapa Generation site.

112 For easy reference, total terrestrial habitat values from Table 1 in CEC Rd 1 CEC-0021 are
113 included in A of this response. Since the terrestrial habitat values include habitat
114 alteration, as well as loss, the table provides area changes rather than area losses.

115 As noted, attempting to estimate total pre-development VEC habitat using this simple
116 extrapolation is misleading for some VEC indicator measures. Habitat availability for
117 some VECs is highly influenced by total Nelson River shoreline length, and this was
118 increased as a result of hydroelectric development. For example, using pre-development
119 shoreline data, bald eagle habitat likely increased by 10% from pre-development to
120 current conditions because the increase in Nelson River shoreline length more than
121 offset the shoreline lost in large lakes flooded by the development of the Kettle
122 generating station. In contrast, the simple area based extrapolation in Table A suggests
123 that available bald eagle habitat declined by 2.5%. Additionally, some VEC habitat
124 elements are based on spatial relationships between environmental attributes (e.g.,
125 proximity to water or a particular type of environmental edge), and the implicit
126 assumptions in an area-based extrapolation may not be valid. Beaver and olive-sided
127 flycatcher provide two examples. Beaver habitat availability is directly linked to
128 shoreline length of suitable waterbodies and, since this shoreline density varies in
129 different unaltered zones of the beaver Regional Study Area, it is reasonable to expect
130 that it may also differ in the areas lost to past development. Similarly, olive-sided
131 flycatcher habitat is directly linked to edges, and edge density in the areas lost to past
132 development may differ substantially from that in the existing available habitat.

133 As discussed in the response to CEC Rd 1 CEC-0021, habitat change values only form one
134 component of the cumulative effects assessment for a VEC. The full assessment of
135 residual adverse effects also included a consideration of qualitative indicators,
136 magnitude (includes the extent to which a VEC is vulnerable to any detectable adverse
137 effect), duration and, for seven of the terrestrial VECs, reversibility, frequency, and
138 ecological context. Coming to a final conclusion for a VEC has, in many cases, required
139 an evaluation of the criteria used to assess significance based on professional judgment,
140 past experience, current and potential future trends for these VECs and other non-
141 quantifiable factors.

142 Please note that some of the areas reported in Tables 2 and 3 of CEC Rd 1 CEC-0021
143 have been revised and updated versions are reattached to this response for reference.

- 144 Areas included in Table A use these revised areas. Bald eagle habitat affected by
145 potential future projects is also included in Table A.

Table A. Total available pre-development habitat, habitat change due to past, current and potential future projects, and percentage of pre-development habitat remaining for wildlife VECs and total terrestrial habitat in their respective Regional Study Areas.

VEC or Habitat Type	Study Zone Used for VEC RSA	Current Available VEC Habitat (ha)	Current Total Terrestrial Habitat (ha)	Proportion for Extrapolation	Total Terrestrial Habitat Pre-development Habitat in Regional Study Area (ha)	Total Available Pre-development VEC Habitat in Regional Study Area (ha)	VEC Habitat Area Change (ha) Due to:			Total Habitat Change from Past, Current & Potential Future Projects (ha)	% of Total Available Pre-development VEC Habitat in RSA Remaining
							Past & Current Projects	Keeyask	Potential Future Projects		
Column	A	B	C	D	E	F	G	H	I	J	K
Calculation	n/a	n/a	n/a	B/C	n/a	D*E	n/a	n/a	n/a	G+H+I	(J+F)/E*100
Common Nighthawk	4	19,172	162,487	0.12	192,134	22,670	-3498	-1,926	-143	-5,586	75.3
Olive-sided Flycatcher	4	9,513	162,487	0.06	192,134	11,249	-1736	-470	-63	-2,276	79.8
Rusty Blackbird	4	39,358	162,487	0.24	192,134	46,539	-7181	-921	-141	-8,248	82.3
Bald Eagle	5	34,354	1,227,250	0.03	1,269,907	35,548	-1,194	380	-69	-883	97.5
Mallard ⁵	4	68,860	216,741	0.32	221,509	70,375	-1,515	-2,958	-902	-5,375	92.4
Beaver	4	20,656	163,879	0.13	192,134	24,217	-3,561	-1,102	-177	-4,840	80.0
Caribou - Winter ¹	6	850,307	1,228,642	0.69	1,269,907	878,866	-28,558	-6,686	-4,119	-39,363	95.5
Caribou - Calving Habitat - Islands in Lakes	6	14,271	2,691,509	0.01	2,733,459	14,493	-222	-132	0	-354	97.6
Caribou - Calving Habitat - Peatland Complexes ²	6	189,969	2,071,295	0.09	2,114,636	193,944	-3,975	-69	-92	-4,136	97.9
Caribou - Intactness ³	6	2,015,340	3,050,226	NA	3,050,226	3,050,226	-193,214	-7,389	-16,153	-216,756	92.9/65.3*
Moose	5	1,228,505	1,228,642	1.00	1,269,907	1,269,765	-41,260	-12,116	-4,948	-58,324	95.4
Terrestrial Habitat ⁴	5	1,227,250	1,227,250	1.00	1,269,907	1,269,907	-57,234	-9,416	-4,865	-71,515	94.4

¹Caribou winter habitat calculations based on coarse habitat types information available for Study Zone 5 only.

²For Caribou Regional Study Zone 6, mapping of peatland calving complexes is limited to 69% coverage in this Study Zone, including terrestrial habitat and water. Percentage of available habitat in Study Zone 6 expected to be higher because the human footprint occupies a smaller proportion of the expanded area than it does in Study Zone 5.

³Calculated intactness estimates based on entire range of Study Zone 6 including burned areas and lakes (not total terrestrial habitat).

⁴Includes total estimated terrestrial habitat alteration as well as loss. Area for past and current projects is less than Table 1 of CEC-0021 because overlap of the Project with their indirect effects is removed for this table. Total area for the Project plus past & current is the same as the corresponding column in Table 1.

⁵Mallard habitat includes both terrestrial and aquatic components

*Based on amount of habitat lost due to buffered human features only; additional loss of 28% habitat due to burns reduces availability to 65.3%.

Table 2. Bird VECs: Habitat Available and Habitat Affected by Keeyask and Past, Present & Potential Future Projects

VEC	VEC Indicators and Indicator Measures			Past & Current Project			Keeyask Project			Keeyask & Past and Current Projects			Keeyask & Past, Current and Future Projects							
	Indicator	Indicator Type ¹	Indicator Measure	Local Study Area (ha)	Regional Study Area (ha)	RSA % Habitat Available	Habitat Affected LSA ² (ha)	Habitat Affected RSA ² (ha)	% RSA Affected	Local Study Area (ha)	Regional Study Area (ha)	RSA % Habitat Available	Habitat Affected: Conawapa (ha)	Habitat Affected: Bipole III (ha)	Habitat Affected: Keewatinoow (ha)	Habitat Affected: Gillam Re-development (ha)	Habitat Affected: Keeyask Transmission (ha)	Habitat Affected: All Future Projects	Habitat Affected: Keeyask & All Future Projects	RSA % Habitat Available
Common Nighthawk	Availability of breeding habitat	QT	Direct habitat loss as a result of construction and operation	5712	19172	11.8	1,926	1,926	1.2	3786	17246	10.3	0	8	0	29	106	143	2,069	10.5
Olive-sided Flycatcher	Availability of breeding habitat	QT	Direct habitat loss as a result of construction and operation	1,646	9513	5.9	470	470	0.3	1176	9043	5.6	0	15	0	1	47	63	533	5.5
Rusty Blackbird	Availability of breeding habitat	QT	Direct habitat loss as a result of construction and operation	5,917	39,358	24.2	921	921	0.6	4996	38437	23.7	0	57	0	0	84	141	1,062	23.6
Bald Eagle	Availability of breeding and perching habitat	QT	Increase in the amount of shoreline habitat resulting from operation	10,125	34,354	2.8	380 (+)	380 (+)	0.03	10505	34734	2.8	43	1	0	26	6	69	311(+)	2.9
Mallard⁴	Availability of breeding habitat	QT	Direct habitat loss as a result of construction and operation	12,159	68,860	31.8	2,958	2,958	1.3	9201	65902	30.4	38	80	0	46	738	902	3,860	29.3

General note: primary and secondary habitat (as defined in the TE SV Section 6) are included in the area totals

¹ QT=quantitative; QL=qualitative; PJ=professional judgement; MX=mixture of QT, QL and PJ

² After Project mitigation.

³ No mitigation for actions (except for Keeyask GS).

⁴ Calculations of mallard habitat loss for the Keeyask GS have been revised using more detailed information for waterbodies located within the RSA.

Table 3. Mammal VECs: Habitat Available and Habitat Affected by Keeyask and Past, Present & Potential Future Projects

VEC	VEC Indicators and Indicator Measures			Past & Current Project			Keeyask Project			Keeyask and Past & Current Projects			Keeyask & past, current & potential future projects Regional Study Area							
	Indicator	Indicator Type ¹	Indicator Measure	Local Study Area ²	Regional Study Area ²	RSA % Habitat Available	Habitat Affected LSA	Habitat Affected RSA	RSA % Affected	Local Study Area	Regional Study Area	RSA % Habitat Available	Conawapa	Bipole III	Keewatinooow	Gillam Re-development	Keeyask Transmission	All Future Projects	Keeyask & All Future Projects	RSA % Habitat Available
Beaver	Physical Habitat ^{3,5}	QT	Direct habitat loss as a result of construction and operation	3,410	20,656	12.6	1102	1102	0.7	2,308	19,554	11.9	NA	56	NA	15	106	177	19,377	11.8
Caribou	Winter habitat ^{3,6,8}	QT	Direct habitat loss as a result of construction and operation	112,496	850,307	69.2	6,686	6,686	0.5	105,810	843,621	68.7	NA	3,045	NA	171	903	4,119	839,502	68.3
	Intactness (EC model) ^{4,7}	QT	The degree to which summer resident caribou habitat remains unaltered by anthropogenic disturbances and fire	NA	2,015,340	66.1	NA	7,389	0.2	NA	2,007,951	65.9	NA	√	NA	√	√	16,153	1,991,798	65.3
	Intactness (EC model) ¹⁵	QT	The degree to which Pen Islands caribou summer range remains unaltered by anthropogenic disturbances and fire	NA	1,074,793	73.1	NA	7,389	0.5	NA	1,067,404	72.6	√	√	√	√	√	26,026	1,041,378	70.9
	Caribou Calving Islands ^{3,7}	QT	Direct habitat loss as a result of construction and operation	5,982	14,271	0.5	132	132	<0.1	5,850	14,139	0.5	NA	0	NA	0	0	0	14,139	0.5
	Caribou Calving Islands ^{3,7,10}	QT	Direct habitat loss as a result of construction and operation (after 30 years of operation)	5,850	14,139	0.5	233	233	<0.1	5,617	13,906	0.5	NA	0	NA	0	0	0	13,906	0.5
	Peatland Complexes ^{7,9,11}	QT	Direct habitat loss as a result of construction and operation	8,272	189,969	9.2	69	69	<0.1	8,203	189,901	9.2	NA	68	NA	0	24	92	189,809	9.2
	Caribou Calving Islands and Peatland Complexes combined ^{3,7,9,11,16}	QT	Direct habitat loss as a result of construction and operation	14,254	204,240	7.6	201	201	<0.1	14,053	204,040	7.6	NA	68	NA	0	24	92	203,948	7.6
	Intactness (EIS model) ^{3,6}	QT	The degree to which hypothetical boreal woodland caribou habitat remains unaltered by anthropogenic disturbances and fire (terrestrial area)	NA	599,830	48.5	NA	7,389	0.6	NA	592,441	47.9	NA	√	NA	√	√	16,153	576,288	46.6
	Intactness (EC model) ^{4,6}	QT	The degree to which hypothetical boreal woodland caribou habitat remains unaltered by anthropogenic disturbances and fire (total area)	NA	911,891	64.4	NA	7,389	0.5	NA	904,502	63.9	NA	√	NA	√	√	16,153	888,349	62.7
	Gray Wolf Density ¹²	MX	Total regional density		1.4			1.4			1.4									
Core Area ¹⁴	QT																			
Linear Feature Density ¹⁴	QT																			
Moose	Physical Habitat ^{3,6}	QT	Direct habitat loss as a result of construction and operation	163,742	1,228,505	99.9	12,116	12,116	1.0	151,534	1,215,691	99.0	NA	3,574	NA	184	1,190	4,948	1,211,441	98.6
	Harvest ¹³	MX	Portion of moose population harvested		<10%			<10%			<10%								<10%	
	Gray Wolf Density ¹²	MX	Total regional density		1.4			1.4			1.4								1.4	

1 - QT = quantitative; QL = qualitative; PJ = professional judgement; MX = mixture of QT, QL and PJ

2 - All Local and Regional Study Area units reported in hectares (ha)

3 - Calculation of % RSA habitat available is based on total terrestrial area of modelled habitat

4 - Calculation of % RSA habitat available is based on total geographic area; EC - Environment Canada

5 - Zone 4

6 - Zone 5

7 - Zone 6

8 - RSA for caribou is Study Zone 6; however for this indicator measure, habitat data and results are limited to Study Zone 5.

9 - Physical habitat loss for peatland complexes includes transmission line rights-of-way, which may not constitute actual habitat loss except for tower footprints

10 - Project effects 30 years after operation

11 - Mapping of peatland complexes is limited to 69% coverage in Zone 6. For future projects, 44 km of the Bipole III transmission line overlap the area without coverage.

12 - Number of gray wolves per 1000 km²

13 - General harvest benchmark reported. See Moose Harvest Sustainability Plan in the Split Lake RMA for other sustainable harvest benchmarks

14 - See Habitat and Ecosystem VEC of Intactness for relevant values applied to mammals

15 - RSA considered for this indicator based on minimum convex polygon for Pen Islands caribou summer range - 1,469,477 ha terrestrial area (adapted from Bipole)

16 - Calculation of % RSA habitat available an underestimate based on incomplete mapping of peatland complexes in Study Zone 6

NA - Not Applicable

√ - Captured elsewhere in All Future Projects combined

General Note: Primary and secondary habitat are included in the area totals

1 **ADDITIONAL INFORMATION RELEVANT TO THE RESPONSE**
2 **TO CEC RD 2 CEC-0102C:**

3 CEC Rd 2 CEC-0102c requested a table providing total pre-development available habitat
4 for wildlife VECs, habitat changes due to past and current projects, the Keeyask project
5 and reasonably foreseeable future projects, and habitat remaining after considering all
6 of these projects. Table A in the original response to CEC Rd 2 CEC-0102c provided this
7 information for wildlife VECs in their respective Regional Study Areas (terrestrial Study
8 Zones 5 and 4 for all but one of the VECs). The amounts of pre-development wildlife
9 habitat were estimated using the ratio approach provided in the Information Request.
10 Corresponding values were also provided for total terrestrial habitat with the difference
11 being that pre-development area was a measured value.

12 In Information Requests CEC Rd 1 CEC-0022 and CEC Rd2 CEC-0102c, the CEC also
13 requested that Study Zone 5 be extended eastward to encompass additional existing
14 developments and future hydroelectric developments such as Bipole III (including the
15 Keewatinoow Converter Station) and the proposed Conawapa Generation Project. In its
16 responses, the Partnership explained how the effects of these projects on the VECs
17 were already captured in the terrestrial assessments. The Partnership indicated in both
18 responses that it believes the terrestrial study zones selected are appropriate for the
19 effects assessment, including the cumulative effects assessment, for each VEC. This
20 perspective has not changed and the Partnership is still confident in its assessment, as
21 filed.

22 However, for information purposes and to more fully address the Information Requests
23 from the CEC, additional work has been undertaken to provide coarse estimates for an
24 eastern extension of Study Zone 5. This attachment to CEC Rd 2 CEC-0102c provides
25 information on total terrestrial habitat (a supporting measure for the ecosystem
26 diversity VEC and the overall terrestrial assessment), core area (an indicator measure for
27 the intactness VEC) and available habitat for wildlife VECs in an eastern extension of the
28 VEC's Regional Study Area (either for Study Zone 5 or 4, depending on the VEC). To
29 correspond with the regional study areas for each VEC in the EIS, two variations of an
30 eastern extension were used; one is roughly equivalent to an extension of Study Zone 5
31 (eastern extension A) and another that is roughly equivalent to Study Zone 4 (eastern
32 extension B). Map 1 shows the eastern extension area boundaries.

33 For the total terrestrial habitat and core area indicator measures, pre-development
34 areas and changes due to past, current and future projects in the area east of Study
35 Zone 5 were measured using waterbody data, digital aerial photos, satellite imagery
36 and/or available project footprint information.

37 For the wildlife VECs, terrestrial habitat mapping data compatible with that used for the
38 Project assessment and consistent with the Project wildlife habitat models are not
39 available for areas east of Study Zone 5. In order to provide the requested information,
40 available habitat in the eastern extension was coarsely estimated using ratios
41 comparable to that suggested by the CEC in CEC Rd 2 CEC-102c to address a similar
42 absence of relevant data. Appendix 1 describes the methods used to complete the
43 analysis (including the ratios and formulas used to coarsely estimate wildlife habitat
44 areas) and provides detailed results. The following section summarizes the results of the
45 analysis for an eastern extension of the VEC's Regional Study Area.

46 **Summary of Results**

47 Compared with the effects reported in the Project assessment, the additional
48 information provided in this attachment demonstrates that, by using ratios to produce
49 coarse habitat estimates, an eastward extension of Study Zone 5 (or Study Zone 4,
50 depending on the VEC) would reduce adverse effects from past, current and future
51 developments on total terrestrial habitat and core area (Table 1). This result occurs
52 because past, current and future developments comprise a lower proportion of an
53 eastern extension area than of Study Zone 5 or 4, leaving a greater proportion of
54 unaffected habitat. This additional information also confirms that the Keeyask
55 Generation Project is not expected to affect the amounts of total terrestrial habitat or
56 core area in areas east of Study Zone 5.

57 The same pattern of reduced adverse effects from past, current and future projects on
58 available wildlife habitat in an eastern extension of Study Zone 5 compared with the EIS
59 results is also apparent for all of the wildlife VECs using the coarse estimates provided
60 by ratios (summarized in Table 1). This pattern occurs because using simple ratios based
61 on total terrestrial habitat causes the coarse estimates for available wildlife habitat to
62 follow the reduced effects on total terrestrial habitat that have been measured.

63 The main limitation to using ratios to coarsely estimate wildlife habitat in an extension
64 area east of Study Zone 5 is the implicit assumption that the terrestrial habitat
65 composition of Study Zone 5 is quite similar to the eastern extension. Available coarse
66 surface materials and soils mapping, a provincial report (Smith et. al 1998) and
67 experience gained from conducting field studies for other projects east of Study Zone 5
68 indicate that the terrestrial habitat and waterbody composition of these two geographic
69 areas are quite different. The area to the east is in a different Ecozone. As examples of
70 the ecological differences, fen habitat for yellow rail and peatland complexes suitable
71 for caribou calving habitat are thought to be considerably more prevalent in the eastern
72 extension area while waterbodies large enough to provide bald eagle habitat are less
73 prevalent. This main limitation is compounded by the fact that a ratio was also used as
74 requested in CEC Rd 2 CEC-102c to estimate total available pre-development habitat in

75 the Keeyask Regional Study Area for the wildlife VECs (the limitations of this ratio-based
76 method to extrapolate pre-development wildlife habitat were discussed in the response
77 to CEC Rd 2 CEC-0102c).

78 As indicated in previous responses to Information Requests, the information provided in
79 this attachment also shows that the Keeyask Generation Project is not expected to
80 affect the amounts of available wildlife habitat in the area east of Study Zone 5. This
81 conclusion reflects the estimated areas of direct and indirect effects from the Keeyask
82 Project, which do not extend into the eastern extension area.

83 In conclusion, mapped changes in total terrestrial habitat and core area due to past,
84 current and existing projects in the eastern extension areas provide a high-level
85 indication that cumulative effects on the regional ecosystem east of Study Zone 5,
86 including for wildlife, are relatively low, and are not expected to increase substantially
87 with reasonably foreseeable future projects. However, while total terrestrial habitat and
88 core area are often used as a “coarse filter” for evaluating and monitoring ecosystem
89 and wildlife effects, a more refined and reliable analysis using detailed habitat mapping
90 will be required in the future to provide a sufficient assessment of the specific effects of
91 future projects when they become subject to regulatory environmental assessment. In
92 particular, such refined analysis will be needed to account for the distinctly different
93 habitat composition and ecological conditions in the area east of Study Zone 5 that will
94 be directly affected by future projects located in this area.

95 Additionally, the information provided in this attachment for an eastern extension of
96 Study Zone 5 to encompass additional existing developments and future hydroelectric
97 developments such as Bipole III (including the Keewatinoow Converter Station) and the
98 proposed Conawapa Generation Project demonstrates (with the above noted
99 limitations) that such an extension would have the effect of reducing the terrestrial
100 effects reported in the filing. The Partnership is confident in its assessment, as filed, and
101 believes the terrestrial study zones selected are appropriate for the effects assessment,
102 including the cumulative effects assessment, for each VEC.

103 **Table 1. Percentages of Habitat Remaining in the Keeyask Regional Study Area, the**
104 **Eastern Extension Only and the Combined Keeyask Regional Study Area and Eastern**
105 **Extension**

VEC	Indicator Measure	Study Zone/ Extension Area Used for VEC	% of Total Pre-development ¹ Habitat Remaining in RSA After Past, Current, Keeyask Generation Project and Reasonably Foreseeable Future Projects		
			Regional Study Area	Eastern Extension Area Only	Regional Study Area plus Extension Area
	<i>Source</i>		<i>Column K in Table A</i>	<i>Column K in Table B</i>	<i>Column K in Table C</i>
Ecosystem Diversity	Total Terrestrial Habitat (ha)- Extension A	5/A	96.4	98.4	96.8
Intactness	Total core area larger than 1,000 ha as a percentage of land area - Extension A	5/A	80.7	90.0	81.7
Common Nighthawk	Habitat (ha)	4/B	75.4	96.7	86.7
Olive-sided Flycatcher	Habitat (ha)	4/B	79.8	97.0	88.9
Rusty Blackbird	Habitat (ha)	4/B	82.3	98.0	90.6
Bald Eagle	Habitat (ha)	5/A	97.5	98.1	97.6
Mallard	Habitat (ha)	4/B	92.4	94.8	93.7
Beaver	Habitat (ha)	4/B	80.0	96.4	88.7
Caribou	Winter Habitat (ha)	5/A	95.5	96.3	95.7
Caribou	Calving Habitat - Islands in Lakes (ha)	6/A	97.6	99.7	98.0
Caribou	Calving Habitat - Peatland Complexes (ha)	6/A	97.9	99.3	98.2
Caribou	Intactness (%)	6/A	92.9*	95.4	93.4
Moose	Habitat (ha)	5/A	95.4	96.8	95.7

¹ Pre-development refers to conditions prior to industrialized development, which is generally around 1950 with the exception of the rail line.

* Based on amount of habitat lost due to buffered human features only; additional loss of 28% habitat due to burns reduces availability to 65.3%.

106

107 **Summary Note on the 2013 Fires**

108 Three wildfires occurred in Study Zone 5 during this past summer. The resulting burned
109 areas do not alter the terrestrial assessment filed by the Partnership for two reasons.
110 First, as a component of the ecosystem-based approach to the assessment, the size and
111 boundaries for Study Zone 5 were established so as to incorporate the ongoing
112 occurrence of large fires. Second, the expectation when the EIS was filed was that it was
113 inevitable that more large fires would occur in the Keeyask area at some time in the
114 future. What was unknown was the timing – i.e., how many years into the future such
115 fires would occur. The following provides a high-level overview of how large fires were
116 incorporated into the assessment.

117 Fire is the dominant natural force that changes ecosystems in the northern Manitoba
118 boreal forest. The species that live in the Keeyask region are used to coping with
119 frequent large fires. When a fire occurs in one area, animals that require older
120 vegetation (e.g., caribou) move to other areas while animals that prefer younger
121 vegetation (e.g., moose, common nighthawk) move to the recent burns from areas that
122 have become too old.

123 To support the ecosystem-based approach to the terrestrial assessment, the size and
124 boundaries for the regional ecosystem (i.e., Study Zone 5) were determined by the area
125 needed to maintain relatively constant proportions of the different habitat types as
126 large fires occur over time. In other words, by the time a new area burns, other burned
127 areas have become old enough to replace them. Basing the regional ecosystem size on
128 fire ecology has two important implications for the terrestrial assessment. First, the
129 Project region is large enough to support self-sustaining populations for most of the
130 resident wildlife species as large fires occur over time. Second, even though large areas
131 burned in the Project area this past summer, the terrestrial assessment conclusions are
132 still valid. They have already taken into account the fact that large fires frequently occur,
133 and fires will continue to occur in the region after the EIS submission. Since the burns
134 affect some aspects of Project implementation (e.g., the approach to reservoir clearing)
135 and Project effects monitoring, the Partnership commits to mapping the areas that were
136 burned and incorporating these changes into Project construction planning and the
137 design of the terrestrial environment monitoring program.

138 **REFERENCES:**

139 Smith, R.E., H. Veldhuis, G.F. Mills, R.G. Eilers, Fraser, W.R., and G.W. Lelyk. 1998.
140 Terrestrial Ecozones, Ecoregions, and Ecodistricts of Manitoba: An Ecological
141 Stratification of Manitoba's Natural Landscapes. Land Resource Unit, Brandon
142 Research Centre, Research Branch, Agriculture and Agri-Food Canada. Research
143 Branch. Technical Bulletin 1998-9E.

144 **Appendix 1: Detailed Information for the Study Zone** 145 **Extension**

146 This appendix details the methods used to estimate available wildlife habitat in the
147 eastern extension and provides information for total terrestrial habitat, core area and
148 available habitat for wildlife VECs in an eastern extension of the VEC's Regional Study
149 Area (either for Study Zone 5 or 4, depending on the VEC).

150 **Eastern Extension Areas**

151 The boundary for the eastern extension suggested in the initial information request (CEC
152 Rd 1 CEC-0022) was applied for this addendum with the exception that the eastern
153 extremity is not as sharply narrowed so as to capture existing Conawapa geotechnical
154 exploration activities (see Map 1).

155 To correspond with the overall approach of using VEC-specific regional study areas that
156 reflect the differing requirements for providing a regional context for ecosystems and
157 wildlife populations, two variations of the eastern extension area that roughly
158 correspond with Study Zones 4 and 5 are used (see Map 1):

- 159 • **Extension B:** This extension variation essentially follows the boundaries suggested
160 by the CEC information request (CEC Rd 1 CEC-0022), and is roughly equivalent to
161 the use of Study Zone 4 as a VEC Regional Study Area. This extension variation is
162 referred to as extension B in the tables and maps below. The total pre-development
163 land area of extension B is approximately 216,742 ha.
- 164 • **Extension A:** This extension variation expands the area captured to be more
165 equivalent to Study Zone 5 by advancing the northern boundary of the eastern
166 extension further north to meet the northeast corner of Study Zone 5. This
167 extension variation is referred to as extension A in the tables and maps below. The
168 total pre-development land area of extension A is approximately 348,637 ha.

169 **Area Estimation Methods**

170 ***Total Terrestrial Habitat and Core Area***

171 The methods used to determine total terrestrial habitat in the Regional Study Areas and
172 in the eastern extension areas for the various development periods were as follows:

- 173 • **Total pre-development terrestrial habitat:** Equals the total size of the study area
174 minus total pre-development waterbody area. Pre-development waterbody areas
175 were obtained from the National Hydrography Network dataset for unflooded areas
176 with the exception that waterbody area for Study Zone 4 was obtained from the
177 large scale terrestrial habitat mapping for existing waterbodies, and from a
178 combination of historical air photos and historical Project information for the

- 179 flooded areas. Total terrestrial habitat area equals total land area in the pre-
180 development period;
- 181 • Losses due to past and current projects: Equals pre-development total terrestrial
182 habitat area from the previous calculation minus total permanent human
183 infrastructure area. Past and current project footprints generally obtained from air
184 photos or satellite imagery (photo-interpreted from large scale air photos for Study
185 Zone 4), and from available project information for the remaining areas;
 - 186 • Losses due to the Keeyask Generation Project: From Table 2-17 of the Terrestrial
187 Environment Supporting Volume (equals permanent habitat loss plus temporary
188 habitat alteration in the Project Footprint); and,
 - 189 • Losses due to reasonably foreseeable projects: From available project information.

190 Map 6-30 in the Response to EIS Guidelines shows human linear features and the
191 locations of settlements in Study Zone 5. Map 2 below shows those features in Study
192 Zone 4 and the eastern half of Study Zone 5, as well as the human infrastructure and
193 waterbodies used to produce total land and total terrestrial habitat areas in the eastern
194 extensions.

195 Since the ratios used to coarsely estimate wildlife habitat are influenced by the size of
196 the past, current and reasonably foreseeable future projects, Appendix 3 details the
197 past, current and future project footprint areas used in the tables produced for this
198 attachment, and describes the sources for the total area change.

199 *Available Habitat for Wildlife VECs*

200 For the wildlife VECs, the ratios used to estimate pre-development habitat and habitat
201 affected by past, current and future projects in the eastern extension areas were
202 comparable to those suggested by the CEC in CEC Rd 2 CEC-102c and were as follows:

- 203 • Pre-development wildlife habitat in the eastern extension area equals the ratio of
204 total pre-development terrestrial habitat in the extension area to total pre-
205 development terrestrial habitat in the Regional Study Area multiplied by the total
206 amount of pre-development VEC habitat in the VEC's Regional Study Area. The
207 version of the eastern extension area used for these calculations is the one that is
208 roughly equivalent to the VEC's Regional Study Area (i.e., extension A for VECs that
209 use Study Zone 5 as their Regional Study Area and extension B for VECs that use
210 Study Zone 4 as their Regional Study Area).
- 211 • The losses of wildlife habitat due to past, current and future projects in the VEC's
212 eastern extension area equals the ratio of total terrestrial habitat losses in the
213 extension area to total terrestrial habitat losses in the VEC's Regional Study Area
214 multiplied by pre-development VEC habitat in the VEC's Regional Study Area.

215 Appendix 2 provides the calculations and values used to determine the ratios. Since the
216 ratio used to coarsely estimate wildlife habitat losses is based on the areas of past,
217 current and future project footprints, Appendix 3 details the project footprints used to
218 develop the total project footprint areas in Table A and Table B.

219 **RESULTS for TOTAL TERRESTRIAL HABITAT and the VECs**

220 Four tables were developed to provide total terrestrial habitat, core area and available
221 habitat for wildlife VECs for an eastern extension of the VEC's Regional Study Area
222 (either for Study Zone 5 or 4, depending on the VEC). The following describes what each
223 of the four tables represents:

- 224 • **Table A:** This table is from the original response to CEC Rd 2 CEC-0102c with the
225 addition of the core area indicator measure for the intactness VEC and a row
226 showing total terrestrial habitat loss in the project footprints. Table A provides
227 values for Study Zones 5 and 4 from the Partnership's EIS filing (these study zones
228 represent the regional study areas for all of the terrestrial VECs except for caribou).
229 In this table, total available pre-development habitat for wildlife VECs was estimated
230 as requested in CEC Rd2 CEC-0102c by extrapolating current available habitat using
231 the ratio approach defined in the response to CEC Rd 2 CEC-0102c (the limitations of
232 this ratio-based extrapolation method were discussed in the response to CEC Rd 2
233 CEC-0102c);
- 234 • **Table B:** This table provides information similar to Table A, but for an extension east
235 of Study Zone 5. Total terrestrial habitat and core area values for extension A and B
236 were measured from available information. For the wildlife VECs, total pre-
237 development habitat and habitat losses due to past, current and reasonably
238 foreseeable future projects were coarsely estimated using ratios comparable to that
239 suggested by the CEC in CEC Rd 2 CEC-102c (the limitations of this method are
240 discussed below);
- 241 • **Table C:** This table provides information similar to Table A for the combined area
242 encompassed by Study Zone 5 and the eastern extension area. That is, Table C
243 integrates results from Table A and Table B; and,
- 244 • **Table 1:** This table (which appears above) summarizes the high-level results from
245 Tables A through C in one place for ease of comparison.

246 The third column of Tables A, B and C and Table 1 shows which Study Zone or extension
247 area was used for the VEC.

248 Table A and Table B provide total terrestrial habitat loss in the project footprints only
249 since the coarse estimation ratios use this value to prorate wildlife habitat into the
250 eastern extension areas. Table 1 of CEC Rd 1 CEC-0021 provided total terrestrial habitat
251 loss in project footprints plus the estimated maximum potential amount of indirect
252 habitat alteration in areas surrounding the footprints, since this was the basis for the

253 ecosystem diversity, wetland function and priority plant VEC assessments. For
254 comparison purposes, the areas of existing projects in Study Zone 5 used in Table A of
255 this attachment and Table 1 of CEC Rd 1 CEC-0021 are 37,045 ha and 42,657 ha,
256 respectively). The primary contributor to the project footprint area reduction was the
257 removal of estimated Kelsey flooding that was actually outside of Study Zone 5 (only
258 155 ha of the 5,700 ha of flooding originally included is in Study Zone 5). This area
259 reduction was partially offset by a few missing borrow areas outside of Study Zone 4 and
260 a number of other small areas.

261 It is noted that using this updated project footprint area information for past and
262 current projects would modify the current available and pre-development total
263 terrestrial habitat areas in Study Zone 5 since a portion of these area were estimated by
264 proration. The EIS version of current available and pre-development total terrestrial
265 habitat areas are used to prorate wildlife habitat to the eastern extension areas for
266 consistency with filed information. This makes very little difference for coarsely
267 estimated wildlife habitat areas for the eastern extension areas because the ratios of
268 current to pre-development total terrestrial habitat are so similar with either version of
269 the project footprint data (see Appendix 3 for details). The updated version of the
270 project footprint areas are used to quantify cumulative losses.

271 *Total Terrestrial Habitat*

272 *Regional Study Area Results (Table A)*

273 The footprints of past and current developments have removed approximately 37,045
274 ha of terrestrial habitat in Study Zone 5. Reasonably foreseeable future projects,
275 including Keeyask, are expected to remove an additional 8,946 ha of terrestrial habitat.
276 The combined terrestrial habitat losses from past, current and potential future projects
277 would reduce total terrestrial habitat to 96.4% of pre-development area.

278 *Eastern Extension Area Only Results (Table B)*

279 Pre-development terrestrial habitat in extension A totaled 348,637 ha (Table B). Past
280 and current projects reduced total terrestrial habitat in by approximately 1,705 ha in
281 extension A and by 1,584 ha in extension B. Reasonably foreseeable future projects are
282 expected to remove an additional 3,911 ha in each extension area. Cumulatively, all of
283 the past, current and reasonably foreseeable future projects are predicted to affect
284 1.6% and 2.5% of the total pre-development terrestrial habitat area in eastern extension
285 areas A and B, respectively. The Keeyask project is not expected to measurably affect
286 the amount or composition of terrestrial habitat in either of these eastern extension
287 areas.

288 **Regional Study Area and Eastern Extension Combined Results (Table C)**
289 As demonstrated in Table C, if Study Zone 5 and eastern extension area A are combined
290 together, past and current projects have removed approximately 38,750 ha of terrestrial
291 habitat relative to pre-development conditions. Past and current projects have affected
292 approximately 37,045 ha of terrestrial habitat in Study Zone 5 (Table A) and 1,559 ha in
293 extension area A (Table B) for a combined total area of 38,750 ha (Table C). Reasonably
294 foreseeable future projects, along with Keeyask, are expected to reduce total terrestrial
295 habitat by an additional 8,946 ha in Study Zone 5 and 3,911 ha in the eastern extension
296 for a total area of 12,857 ha for the combined Study Zone 5 and eastern extension. This
297 would mean that, cumulatively, total terrestrial habitat losses with past, current and all
298 reasonably foreseeable future projects would reduce total terrestrial habitat by
299 approximately 3.2%, or to 96.8% of total pre-development area for the combined area
300 encompassed by Study Zone 5 and eastern extension A. By comparison, Table A
301 indicates that cumulative effects on total terrestrial habitat in Study Zone 5 without an
302 eastern extension is a reduction of approximately 3.6% to 96.4% of the pre-
303 development area.

304 *Intactness*

305 For the intactness VEC, core areas for the eastern extension area were obtained as the
306 land areas left after buffering human features in the same manner as for the Study Zone
307 5 analysis (i.e., 200 m for transmission lines and cutlines; 500 m for all other features).
308 While the cutline data for the eastern extension was incomplete because these features
309 have not been fully mapped for this area, including the missing cutlines is not expected
310 to substantially alter on the core area results since it is expected that most of the
311 missing cutlines are in close proximity to each other or other human features (i.e., large
312 portions of the individual cutline buffers will be overlapping). Additionally, the
313 additional buffered area of any missing isolated cutlines would have to be very large to
314 reduce core area from its current high level to a moderate level (i.e., from 90% to 65%;
315 more than 3,000 ha of additional buffered area needed to reduce core area by 1%).
316 Also, the reported total core area percentage is for core areas larger than 1,000 ha. The
317 EIS also reports total core area percentage for core areas larger than 200 ha, which is
318 considered a suitable minimum size for most wildlife species.

319 Map 3 below shows existing core areas in both eastern extension areas and in the
320 eastern half of Study Zone 5.

321 Table B indicates that, in the eastern extension areas, past and current projects have
322 reduced total core area in core areas larger than 1,000 ha to 92% of land area in
323 extension area A. Reasonably foreseeable future projects are expected to further reduce
324 core area to 90% of land area. The Keeyask Project is not expected to measurably affect
325 core area in the eastern extension areas.

326 As demonstrated in Table C, if Study Zone 5 and extension area A are combined
327 together, total core area in core areas larger than 1,000 ha is cumulatively reduced by
328 past, current and reasonably foreseeable projects to approximately 82% of land area.
329 Past and current projects have cumulatively reduced total core area in core areas larger
330 than 1,000 ha to approximately 83% of land area in Study Zone 5 (Table A) and to 92% of
331 land area in extension area A (Table B) for a total reduction to approximately 85% of
332 land area in the combined Study Zone 5 and extension area A (Table C). Reasonably
333 foreseeable future projects, along with Keeyask, are expected to reduce total core area
334 in core areas larger than 1,000 ha to approximately 81% of land area in Study Zone 5
335 and to 90% of land area in extension area A for a total reduction to 82% for the
336 combined Study Zone 5 and eastern extension. By comparison, Table A without an
337 eastern extension indicates that after considering the combined effects of past, current
338 and reasonably foreseeable future projects, total core area in core areas larger than
339 1,000 ha is approximately 81% of the pre-development area.

340 *Wildlife VECs*

341 As noted above, the amount of available habitat for wildlife VECs within the eastern
342 extension area was derived using ratios comparable to that suggested by the CEC in CEC
343 Rd 2 CEC-102c (see above for details).

344 As was the case for total terrestrial habitat and core area, Table A provides available
345 habitat values for the VEC's Regional Study Area, Table B provides corresponding values
346 for the equivalent eastern extension area and Table C presents the results obtained
347 when the eastern extension area is combined with the Keeyask Regional Study Area
348 (either Study Zone 5 and extension A or Study Zone 4 and extension B, depending on the
349 wildlife VEC).

350 Table 1 presents the percentages of total wildlife habitat remaining after past, current
351 and reasonably foreseeable future projects for the VEC's Regional Study Area, the
352 equivalent eastern extension and the combined area included in the VEC's Regional
353 Study Area and eastern extension.

354 Bald eagle and common nighthawk demonstrate the range of differences in available
355 habitat arising from the application of the formulas (Table 1). Remaining bald eagle
356 habitat increases from 97.5% in the Keeyask Regional Study Area to 97.6% in the
357 combined Regional Study Area and eastern extension while the corresponding values for
358 common nighthawk increase from 75.4% to 86.7%. The larger differences occur for
359 wildlife VECs that use Study Zone 4 as their Regional Study Area because projects
360 comprise a higher proportion of the smaller study area and because the cumulative
361 project footprint is smaller in the extension area.

362 As noted in the Summary section at the beginning of this attachment, Table 1
363 demonstrates that the same pattern of differences is observed for all of the wildlife
364 VECs when the percentage of area remaining in the eastern extension (Table B) or the
365 combined area (Table C) is compared with the corresponding percentage for the
366 Regional Study Areas (Table A). That is, the available habitat remaining in the eastern
367 extension alone is always a higher percentage of pre-development habitat than
368 reported for the Regional Study Area, as are the corresponding percentages for the
369 combined Regional Study Area and eastern extension. This pattern results because the
370 same two ratios determine the wildlife habitat areas for each VEC that uses the same
371 Regional Study Area.

372 As noted in the introduction, the main limitation to using ratios to coarsely estimate
373 wildlife habitat in an extension area east of Study Zone 5 is the implicit assumption that
374 the terrestrial habitat composition of Study Zone 5 is quite similar to the area to the
375 east, which is not the case.

376 Bald eagle provides a good example of the limitations of using ratios to estimate
377 available habitat. Bald eagle nest in treed riparian habitats adjacent to large rivers and
378 lakes. The amount of available riparian or shoreline habitat for bald eagles has actually
379 increased, not decreased since pre-development. This increase is attributed to
380 hydroelectric projects and creation of reservoirs which expand shoreline through
381 flooding (see original response to CEC RD 2 CEC-0102c). Prorating current bald eagle
382 habitat in Study Zone 5 to estimate the amount of pre-development habitat in the
383 eastern extension therefore gives inaccurate results in Tables B and C. Additionally,
384 waterbodies large enough to provide bald eagle habitat are less prevalent in the eastern
385 extension area which means less suitable shoreline for bald eagles and proportionately
386 less bald eagle habitat.

387 Table A. Habitat and Intactness Amounts for the Keeyask Regional Study Areas (Study Zone 5 or 4) – DATA FROM ORIGINAL RESPONSE TO CEC RD 2 CEC-0102c

VEC	Indicator Measure	Study Zone Used for VEC RSA	Current Available for VEC	Current Total Terrestrial Habitat (ha)	Proportion for Extrapolation	Total Terrestrial Habitat Pre-development Habitat in RSA (ha)	Total Available Pre-development VEC Habitat in Regional Study Area (ha)	Change Due to:			Total Habitat Change from Past, Current & Potential Future Projects (ha)	% of Total Available Pre-development VEC Habitat in RSA Remaining
								Past & Current Projects	Keeyask	Potential Future Projects*		
	Column Calculation	A	B	C	D	E	F	G	H	I	J	K
		n/a	n/a	n/a	B/C	n/a	D*E	n/a	n/a	n/a	G+H+I	(F+J)/F*100
Ecosystem Diversity	Total Terrestrial Habitat Loss in Project Footprints (ha) ¹	5	n/a	1,227,250	n/a	1,269,907	n/a	-37,045	-6,823	-2,123	-45,991	96.4%
Ecosystem Diversity	Total Terrestrial Habitat Loss in Project Footprints and Estimated Maximum Potential Indirect Alteration in Surrounding Areas (ha) ²	5	n/a	1,227,250	n/a	1,269,907	n/a	-56,836	-9,416	-4,865	-71,117	94.4%
Intactness	Total core area larger than 1,000 ha as a percentage of land area	5	n/a	n/a	n/a	n/a	99.0%	-16.5%	-0.7%	-1.1%	-18.3%	80.7%
Common Nighthawk	Habitat (ha)	4	19,172	162,487	0.12	192,134	22,670	-3,498	-1,926	-143	-5,586	75.4%
Olive-sided Flycatcher	Habitat (ha)	4	9,513	162,487	0.06	192,134	11,249	-1,736	-470	-63	-2,276	79.8%
Rusty Blackbird	Habitat (ha)	4	39,358	162,487	0.24	192,134	46,539	-7,181	-921	-141	-8,248	82.3%
Bald Eagle	Habitat (ha)	5	34,354	1,227,250	0.03	1,269,907	35,548	-1,194	380	-69	-883	97.5%
Mallard	Habitat (ha) ³	4	68,860	216,741	0.32	221,509	70,375	-1,515	-2,958	-902	-5,375	92.4%
Beaver	Habitat (ha)	4	20,656	163,879	0.13	192,134	24,217	-3,561	-1,102	-177	-4,840	80.0%
Caribou	Winter habitat (ha) ⁴	6	850,307	1,228,642	0.69	1,269,907	878,865	-28,558	-6,686	-4,119	-39,363	95.5%
Caribou	Calving Habitat - Islands in Lakes (ha)	6	14,271	2,691,509	0.01	2,733,459	14,493	-222	-132	0	-354	97.6%
Caribou	Calving Habitat - Peatland Complexes (ha) ⁵	6	189,969	2,071,295	0.09	2,114,636	193,944	-3,975	-69	-92	-4,136	97.9%
Caribou	Intactness (percentage of region area) ⁶	6	2,015,340	3,050,226	NA	3,050,226	3,050,226	-193,214	-7,389	-16,153	-216,756	92.9%**
Moose	Habitat (ha)	5	1,228,505	1,228,642	1.00	1,269,907	1,269,765	-41,260	-12,116	-4,948	-58,324	95.4%

388 ¹ Wildlife habitat extrapolation formulas are based on terrestrial habitat losses in project footprint areas only. See next table row for areas included in the response to CEC-0021. Note that current area is less than the pre-development area minus change due to past
389 and current projects because these values originally included a component that prorated areas to Study Zone 5. The EIS values are used to maintain consistency with filed information. The ratio of current to pre-development areas is so similar in both versions of
390 current and pre-development total terrestrial habitat that there is no noticeable difference in the habitat areas extrapolated to the extension areas (see Appendix 3 for details).

391 ² These are the areas included in the response to CEC-0021. Wildlife habitat extrapolation formulas are based on terrestrial habitat losses in project footprint areas only.

392 ³ Mallard habitat includes both terrestrial and aquatic components

393 ⁴ Caribou winter habitat calculations based on coarse habitat types information available for Study Zone 5 only.

394 ⁵ For Caribou Regional Study Zone 6, mapping of peatland calving complexes is limited to 69% coverage in this Study Zone, including terrestrial habitat and water. Percentage of available habitat in Study Zone 6 expected to be higher because the human footprint
395 occupies a smaller proportion of the expanded area than it does in Study Zone 5.

396 ⁶ Calculated intactness estimates based on entire range of Study Zone 6 including burned areas and lakes (i.e., total terrestrial habitat plus portions of waterbodies without emergent vegetation).

397 * Reported area is incremental to Keeyask Project. ** Based on amount of habitat lost due to buffered human features only; additional loss of 28% habitat due to burns reduces availability to 65.3%.

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398 **Table B. Habitat and Intactness Amounts for the Eastern Extension Areas Only**

VEC	Indicator Measure	Extension Area Used for VEC	Total Terrestrial Habitat Pre-development in VEC Regional Study Area (ha)	Total Terrestrial Habitat Pre-development Habitat in VEC Extension Area (ha)	Proportion for Extrapolation	VEC Available Pre-development Habitat in Regional Study Area (ha)	VEC Available Pre-development Habitat in Extension Area (ha)	Change Due to:			Total Habitat Change from Past, Current & Potential Future Projects (ha)	% of Total Available Pre-development VEC Habitat in RSA Remaining
								Past & Current Projects	Keeyask	Potential Future Projects		
	Column	A	B	C	D	E	F	G	H	I	J	K
	Calculation	n/a	1,269,907 for VECs that use extension A and 192,134 for VECs that use extension B	Column E - first area for extension A and second area for extension B	C/B	Column F in Table A for wildlife VECs	D*E for wildlife VECs	C * Ratio A or D for wildlife VECs ¹	n/a	C * Ratio C or F for wildlife VECs ¹	G+H+I	(F+J)/F*100
Ecosystem Diversity	Total Terrestrial Habitat Loss (ha)-Extension A	A	n/a	n/a	n/a	n/a	348,637	-1,705	0	-3,911	-5,616	98.4%
Ecosystem Diversity	Total Terrestrial Habitat Loss (ha)-Extension B	n/a	n/a	n/a	n/a	n/a	216,742	-1,584	0	-3,911	-5,495	97.5%
Intactness	Total core area larger than 1,000 ha as a percentage of land area - Extension A	A	n/a	n/a	n/a	n/a	99.9%	-8.3%	0.0%	-1.6%	-9.9%	90.0%
Common Nighthawk	Habitat (ha)	B	192,134	216,742	1.13	22,670	25,574	-193	0	-638	-831	96.7%
Olive-sided Flycatcher	Habitat (ha)	B	192,134	216,742	1.13	11,249	12,689	-96	0	-281	-377	97.0%
Rusty Blackbird	Habitat (ha)	B	192,134	216,742	1.13	46,539	52,500	-396	0	-630	-1,026	98.0%
Bald Eagle	Habitat (ha)	A	1,269,907	348,637	0.27	35,548	9,759	-55	0	-127	-182	98.1%
Mallard	Habitat (ha)	B	192,134	216,742	1.13	70,375	79,388	-84	0	-4,027	-4,111	94.8%
Beaver	Habitat (ha)	B	192,134	216,742	1.13	24,217	27,319	-197	0	-790	-987	96.4%
Caribou	Winter habitat (ha) ²	A	1,269,907	348,637	0.27	878,865	241,281	-1,314	0	-7,588	-8,902	96.3%
Caribou	Calving Habitat - Islands in Lakes (ha)	A	1,269,907	348,637	0.27	14,493	3,979	-10	0	0	-10	99.7%
Caribou	Calving Habitat - Peatland Complexes (ha)	A	1,269,907	348,637	0.27	193,944	53,245	-183	0	-169	-352	99.3%
Caribou	Intactness (%)	A	1,269,907	348,637	0.27	3,050,226	837,400	-8,893	0	-29,757	-38,650	95.4%
Moose	Habitat (ha)	A	1,269,907	348,637	0.27	1,269,765	348,598	-1,899	0	-9,115	-11,014	96.8%

399 ¹ See Appendix 2 for ratios and calculations used to derive the ratios.

400 ² Overstates the habitat loss because it is based on the Study Zone 5 equivalent (Table A uses Study Zone 5) whereas Study Zone 6 is the caribou Regional Study Area, and human disturbance is negligible beyond Study Zone 5. Study Zone 5 used for the Table A
401 calculations due to lack of suitable data for Study Zone 6.

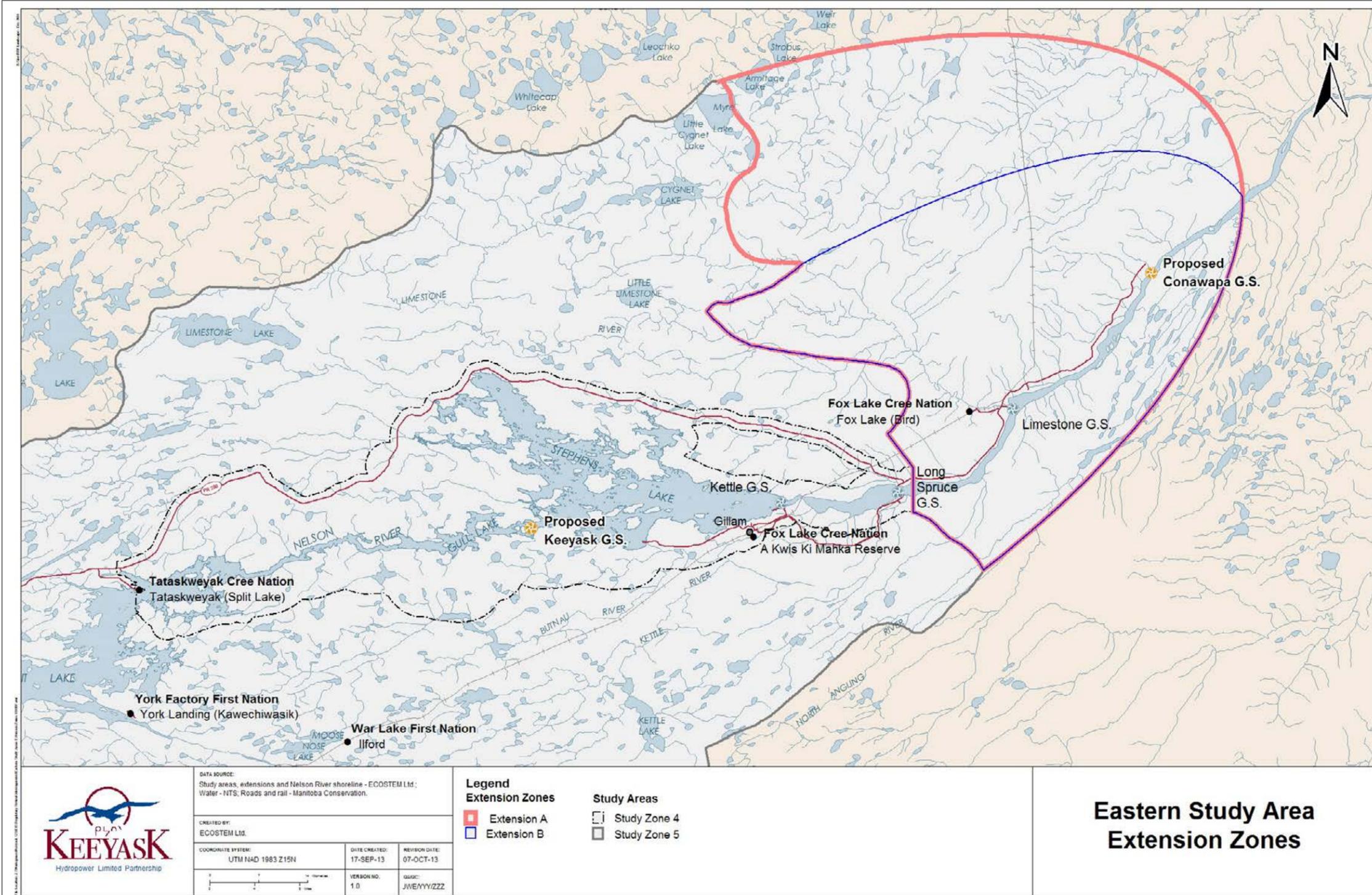
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402 **Table C. Habitat and Intactness amounts for the combined Keeyask Regional Study Area and the Eastern Extension**

VEC	Indicator Measure	Study Zone Used for VEC RSA	Total Available Pre-development Habitat in Regional Study Area (ha)	Change Due to:			Total Habitat Change from Past, Current & Potential Future Projects (ha)	% of Total Available Pre-development VEC Habitat in RSA Remaining
				Past & Current Projects	Keeyask	Potential Future Projects		
	<i>Column</i>	<i>A</i>	<i>F</i>	<i>G</i>	<i>H</i>	<i>I</i>	<i>J</i>	<i>K</i>
	<i>Calculation</i>	<i>n/a</i>	<i>Column F in Table A + Column F in Table B for Wildlife VECs</i>	<i>Column G in Table A + Column G in Table B</i>	<i>Column H in Table A + Column H in Table B</i>	<i>Column I in Table A + Column I in Table B</i>	<i>G+H+I</i>	<i>(F+J)/F*100</i>
Ecosystem Diversity	Total Terrestrial Habitat (ha)- Extension A	5/A	1,618,544	-38,750	-6,823	-6,034	-51,607	96.8%
Intactness	Total core area larger than 1,000 ha as a percentage of land area - Extension A	5/A	99.2%	-14.7%	-2.3%	-1.2%	-18.1%	81.7%
Common Nighthawk	Habitat (ha)	4/B	48,244	-3,691	-1,926	-781	-6,398	86.7%
Olive-sided Flycatcher	Habitat (ha)	4/B	23,938	-1,832	-470	-344	-2,646	88.9%
Rusty Blackbird	Habitat (ha)	4/B	99,039	-7,577	-921	-771	-9,269	90.6%
Bald Eagle	Habitat (ha)	5/A	45,307	-1,249	380	-196	-1,065	97.6%
Mallard	Habitat (ha)	4/B	149,763	-1,599	-2,958	-4,929	-9,486	93.7%
Beaver	Habitat (ha)	4/B	51,536	-3,758	-1,102	-967	-5,827	88.7%
Caribou	Winter Habitat (ha)	5/A	1,120,146	-29,872	-6,686	-11,707	-48,265	95.7%
Caribou	Calving Habitat - Islands in Lakes (ha)	6/A	18,472	-232	-132	0	-364	98.0%
Caribou	Calving Habitat - Peatland Complexes (ha)	6/A	247,189	-4,158	-69	-261	-4,488	98.2%
Caribou	Intactness (%)	6/A	3,887,626	-202,107	-7,389	-45,910	-255,406	93.4%
Moose	Habitat (ha)	5/A	1,618,363	-43,159	-12,116	-14,063	-69,338	95.7%

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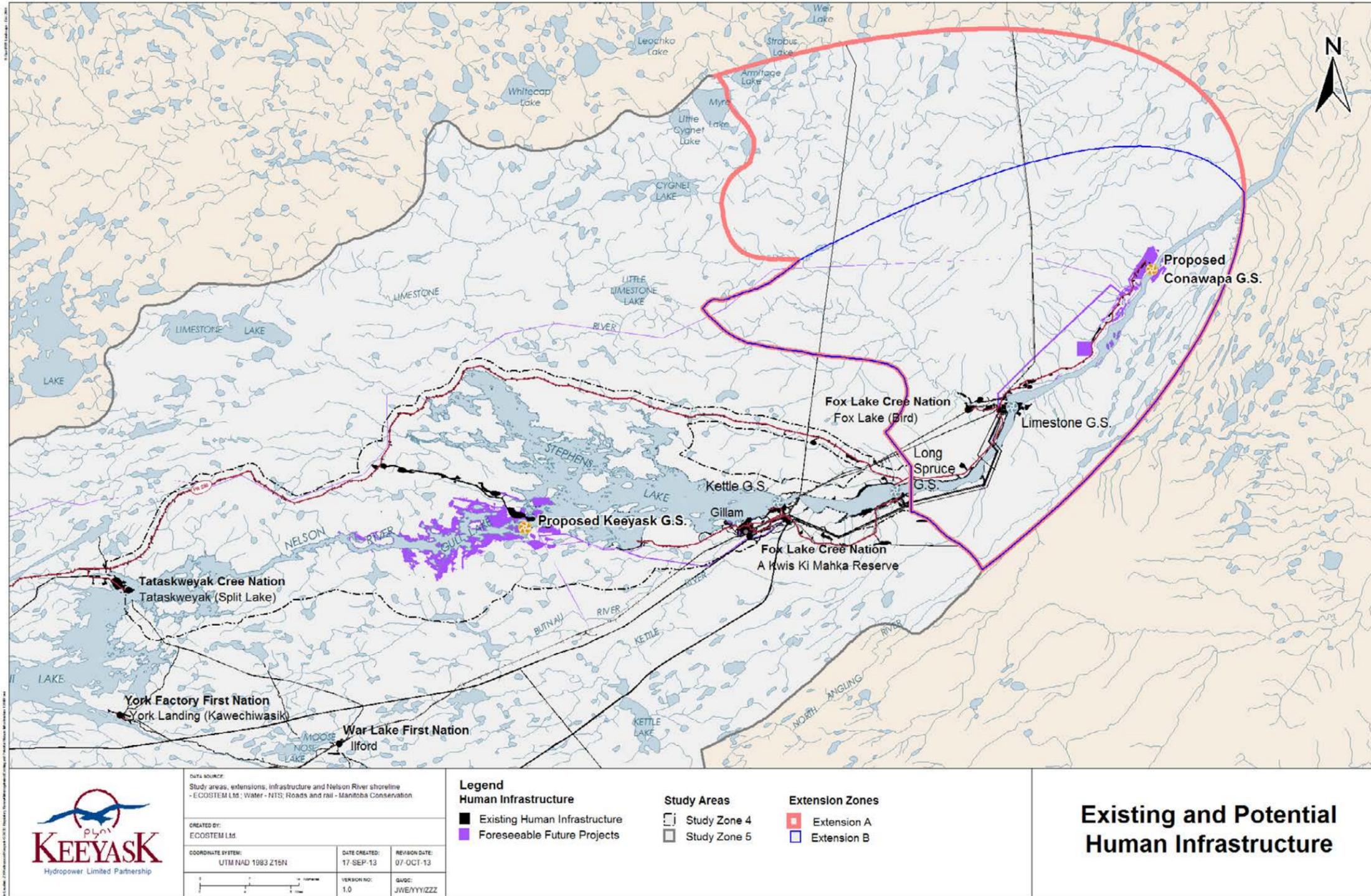
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404
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Map 1. Eastern Extension Area A and B

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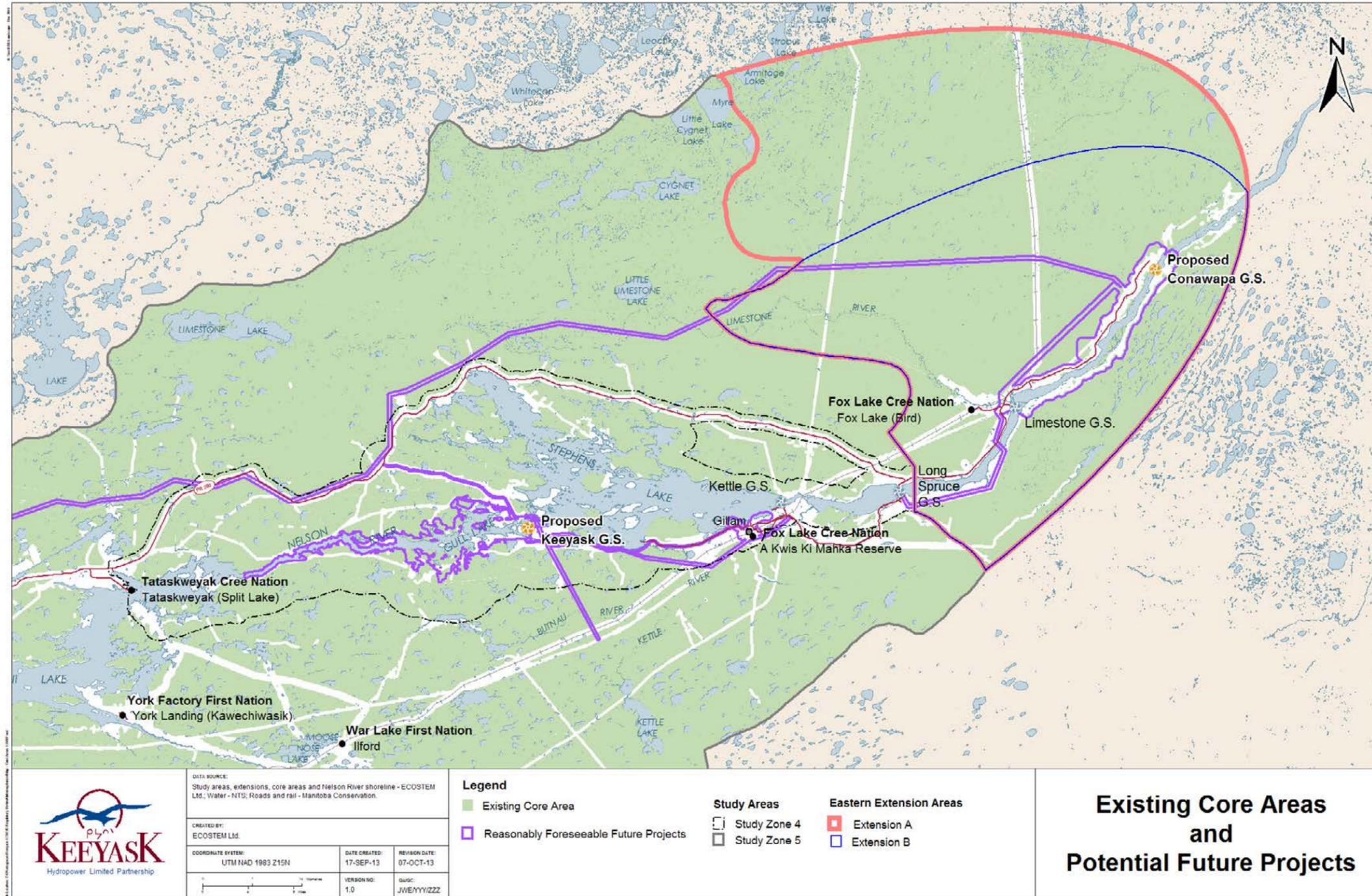


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 407
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Map 2. Human Infrastructure and Waterbodies in the Eastern half of Study Zone 5 and in the Eastern Extension Areas

Note: Footprints for future projects are based on available information and may change as plans become more refined and based on actual construction practices.

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409
 410 **Map 3. Core Area in the Eastern Half of Study Zone 5 and in the Eastern Extension Areas**

411 Note: Footprints for future projects are based on available information and may change as plans become more refined and based on actual construction practices.

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412 **Appendix 2: Ratio Calculations**

413 This appendix provides the calculations used to derive the ratios used to determine available wildlife
 414 VEC habitat in the relevant eastern extension area.

415 **Table D. Percentages of Habitat Remaining in the Keeyask Regional Study Area, the Eastern Extension**
 416 **Only and the Combined Keeyask Regional Study Area and Eastern Extension**

	Source		
	Past and current	Keeyask	Future Projects
VECs that use Study Zone 5 as their Regional Study Area			
Total terrestrial habitat loss (ha) in Study Zone 5	37,045	6,823	2,123
Total terrestrial habitat loss (ha) in Extension Area A	1,705	0	3,911
Ratio applied to VEC's pre-development habitat area in Study Zone 5	0.05	0.00	1.84
VECs that use Study Zone 4 as their Regional Study Area			
Total terrestrial habitat loss (ha) in Study Zone 4	28,705	6,823	876
Total terrestrial habitat loss (ha) in Extension Area B (ha)	1,584	0	3,911
Ratio applied to VEC's pre-development habitat area in Study Zone 4	0.06	0.00	4.46

417



418 **Appendix 3: Land Areas for Past, Current and Reasonably Foreseeable**
419 **Future Projects**

420 Since the ratio used to coarsely estimate wildlife habitat losses is based on the areas of project
421 footprints, this appendix provides the past, current and reasonably foreseeable future project footprint
422 areas that were used to develop the total project footprint areas in Table A and Table B. Table E
423 provides these areas for Study Zones 4 and 5 while provides the areas for eastern extensions A and B.
424 Map 2 shows all of the features that have been included for the eastern extension area, for Study Zone 4
425 and for the eastern half of Study Zone 5.

426 The areas for some project features provided in Table E and Table F differ from those reported in the EIS
427 or responses to Information Requests. There are several potential valid reasons for differing areas being
428 provided by alternative sources, some of which were described in responses to Information Requests
429 that asked for clarification as to why reported areas for the same feature were not identical in all
430 sources (e.g., CEC Rd 2 CEC-0102b). The primary reasons for differing areas being provided by
431 alternative sources are:

- 432 • The “study area” is different and the feature extends outside of the study area (e.g., use of Split Lake
433 RMA versus Study Zone 5);
- 434 • The reported value may be total footprint area, total land area, total terrestrial habitat or total
435 native terrestrial habitat;
- 436 • Some footprints overlap each other (e.g., flooding covers a borrow area; transmission line right-of-
437 way crosses a road). The area that would be double-counted where features cross over each other
438 may or may not be removed; and/or,
- 439 • In the case of terrestrial habitat values, the total can either be for the footprint only or for the
440 footprint plus the estimated maximum potential amount of indirect habitat alteration surrounding
441 the footprint.

442 Based on the above, the type of reported value is dependent on its context, which is a valid reason for
443 differences between various sources.

444 Table E and Table F provide the footprint areas used to produce the total terrestrial habitat losses from
445 past, current and reasonably foreseeable future projects reported in Tables A and B. In general, overlaps
446 with other project footprints have been removed. This can produce a large reduction in area compared
447 with values reported in other sources, particularly for future projects. Additionally, limited effort was
448 allocated to determining where one “project” ended and another started. As examples, borrow areas
449 along PR 280 are generally lumped with the PR 280 footprint and roads going to settlements may be
450 typed as either road or the settlement they enter.

451 While some small project footprints may be missing from these tables, the overall results in Tables B, C
452 and 1 would change little even if the time was taken to find and map missing small footprints because

453 their total are would need to amount to more than 1,600 ha to create a 0.1% reduction in total
454 terrestrial habitat remaining.

455 As noted in the Results for Total Terrestrial Habitat Section, the total terrestrial habitat loss from past
456 and current projects in Study Zone 5 is 37,045 ha, which is 5,612 ha lower than the 42,657 ha included in
457 the total used in CEC-0102c. The primary contributor to the project footprint area reduction was the
458 removal of estimated Kelsey flooding that was actually outside of Study Zone 5 (5,700 ha of flooding was
459 actually 155 ha). This area reduction was partially offset by a few missing borrow areas outside of Study
460 Zone 4. The updated version of the project footprint areas area was used to quantify cumulative losses.

461 It is noted that an implication of this updated project footprint area information for past and current
462 projects is that current and pre-development total terrestrial habitat area in Study Zone 5 are slightly
463 different than reported in the EIS. This occurs because a component of both of these areas in the EIS
464 was estimated by prorating areas from Study Zone 4. Using the more refined project footprint mapping
465 completed for this attachment produces pre-development total terrestrial habitat area of 1,262,248 ha
466 which compares with the EIS value 1,269,907 ha. Because the amount of current available terrestrial
467 habitat in the portion of Study Zone 5 outside of Study Zone 4 was prorated using a ratio that
468 incorporated the existing human footprint, the refined project footprint mapping also reduces current
469 available terrestrial habitat in Study Zone 5 to 1,225,203 ha. The EIS version of current available and pre-
470 development total terrestrial habitat areas are used to prorate wildlife habitat to the eastern extension
471 areas for consistency with filed information. This makes very little difference for coarsely estimated
472 wildlife habitat areas for the eastern extension areas because the ratios of current to pre-development
473 total terrestrial habitat are so similar with either version of the project footprint data. The pre-
474 development area change relative to the refined values is less than 1% and the ratio of current to pre-
475 development terrestrial habitat in the previously reported and refined values are very similar (0.966
476 compared with 0.971). In other words, either version would produce virtually the same wildlife VEC
477 habitat areas in the eastern extension areas using the estimation ratios defined in Appendix 2.

478 **Table E. Land Areas for Past, Current and Reasonably Foreseeable Future Projects in Study Zones 4**
 479 **and 5**

Project/ Feature Type	Feature	Total Area (ha)*		
		Study Zone 4	Study Zone 5 Area Outside of Study Zone 4	Study Zone 5
Existing				
Road	PR 280	1,071	1,070	2,141
	Butnau Road	83		83
	Winter road	15	240	255
	Other	77	522	599
Railway		72	340	412
Settlement	Gillam, Split Lake, York, War Lake	305	439	745
	Thompson		2,169	2,169
Kelsey	Generating Station		159	159
	Flooding ¹		155	155
Kettle	Generating Station	341	1	342
	Flooding	23,800		23,800
Limestone	Flooding	17		17
Long Spruce	Generating Station	225		225
	Flooding	1,429		1,429
Keeyask Infrastructure Project		794		794
Transmission	BP I and II - Radisson to Dorsey	15	919	934
	Henday to Radisson - DC	36	21	57
	Kelsey - multiple lines converging		15	15
	Kelsey to Mystery Lake		246	246
	Kelsey to Oxford House		151	151
	Kelsey to Radisson	28	841	869
	Kelsey to Split Lake		269	269
	Kettle to Limestone	21	29	51
	Kettle to Thompson (INCO)		335	335
	Long Spruce to Henday	18	0	18
	Long Spruce to Radisson	112	16	127
	Mystery Lake to Laurie River		73	73
	Radisson to Churchill	14	53	67
	Radisson to Kelsey	38	47	85
	Other	47	20	67
Other	Borrow areas, ditches, clearings, abandoned roads	175	232	407
Total Existing Before Overlaps Removed		28,734	8,366	37,100
Total Existing After Overlaps Removed				37,045
<i>Total Land Area</i>		<i>192,134</i>	<i>1,077,773</i>	<i>1,269,907</i>
<i>Existing Projects as a Percentage of Total Land Area</i>		<i>15.0%</i>	<i>0.8%</i>	<i>2.9%</i>



Project/ Feature Type	Feature	Total Area (ha)*		
		Study Zone 4	Study Zone 5 Area Outside of Study Zone 4	Study Zone 5
Future²				
Settlement	Gillam Redevelopment	142		142
Bipole III	Right-of-way	248	1,140	1,388
Keeyask Transmission	Construction Power	63	51	114
Keeyask Transmission	Outlet Power	448	88	536
Keeyask Generation Project ³		6,823		6,823
Total Future After Overlaps Removed		7,725	1,278	8,946
<i>Total Land Area</i>		<i>192,134</i>	<i>1,077,773</i>	<i>1,269,907</i>
<i>Future Projects as a Percentage of Total Land Area</i>		<i>4.0%</i>	<i>0.1%</i>	<i>0.7%</i>
<i>Existing and Future Projects as a Percentage of Total Land Area</i>		<i>19.0%</i>	<i>0.9%</i>	<i>3.6%</i>

480 * Area will often be different from other sources because it is land area only and/or the overlaps with other
 481 footprints have been removed (see text for explanation and additional factors).
 482 ¹ Used 5,700 ha for Study Zone 5 in the EIS. Was estimated by roughly prorating from Split Lake PPER. Subsequent
 483 mapping of the flooded area has reduced the flooding footprint by 5,545 ha to 155 ha.
 484 ² Footprints for future projects are based on available information and may change as plans become more refined
 485 and based on actual construction practices.
 486 ³ Lower total area than Project description because flooded surface water and existing human footprints (622 ha)
 487 are not included. The EIS also includes an additional 2,592 ha for estimated maximum potential indirect terrestrial
 488 habitat alteration in areas surrounding the project footprint for a total of 9,416 ha of terrestrial habitat affected
 489 after 30 years of operation.



490 **Table F. Land Areas for Past, Current and Reasonably Foreseeable Future Projects in Extension Areas A**
 491 **and B**

Project/ Feature Type	Feature	Total Area (ha)*		
		Extension B	Extension A Area Outside of Extension B	Extension A
Existing				
Road	PR 290	39		39
Railway	Abandoned Rail Line to Port Nelson (decommissioned) ¹	0		0
	Amery Train Station ²	0		0
	Hudson Bay Railway	103	36	139
Settlement	Bird - Community and airstrip	77		77
Other	Communication Tower ³	0.1		0.1
Conawapa	Access Road	71		71
	Borrow and Cleared Areas	99		99
Henday	Converter Station	24		24
	Henday to Radisson - 500 kV DC	67		67
	Long Spruce to Henday - 230 kV AC Collector lines	197		197
Limestone	Borrow and Cleared Areas	339		339
	Generating Station	227		227
	Sundance Camp	37		37
	Flooding	193		193
Transmission	Ground Electrode	46		46
	Kettle to Limestone - KN 36 - 138 kV AC	30		30
	Limestone To Henday	12		12
	Radisson to Churchill - RC60 - 138 kV AC	47	85	132
	Spare Nelson River Crossing - 500 kV DC	30		30
Total Existing Before Overlaps Removed		1,638	121	1,759
Total Existing After Overlaps Removed				1,705
<i>Total Land Area</i>		<i>215,161</i>	<i>124,488</i>	<i>339,649</i>
<i>Existing Projects as a Percentage of Total Land Area</i>		<i>0.7%</i>	<i>0.1%</i>	<i>0.5%</i>
Future⁴				
Bipole III	Construction Power Station	2		2
	Keewatinooow Converter Station ⁵	37		37
	Keewatinooow Ground Electrode Site	406		406
	Limestone Stores Area	0.3		0.3
	Main Construction Camp	27		27
	MH & Contractor Work Areas	21		21
	Potential Borrow Areas	230		230

Project/ Feature Type	Feature	Total Area (ha)*		
		Extension B	Extension A Area Outside of Extension B	Extension A
	Potential Material Placement Areas	143		143
	Cleared Right-of-Way	323		323
	Start-Up Camp	18		18
	Keewatinoow AC Collector Lines	820		820
	Keewatinoow Ground Electrode Line	52		52
Conawapa	All components	1,759		1,759
	Generation Outlet Transmission RoW ⁶	170		170
	Total Future Before Overlaps Removed	4,008	0	4,008
	Total Future After Overlaps Removed			3,911
	<i>Total Land Area</i>	<i>215,161</i>	<i>124,488</i>	<i>339,649</i>
	<i>Future Projects as a Percentage of Total Land Area</i>	<i>2.0%</i>	<i>0.0%</i>	<i>1.2%</i>
	<i>Existing and Future Projects as a Percentage of Total Land Area</i>	<i>2.7%</i>	<i>0.1%</i>	<i>1.8%</i>

492 * Area will often be different from other sources because it is land area only and/or overlaps with other footprints
 493 have been removed (see text for additional factors).

494 ¹ Decommissioned.

495 ² Station stop. Train stops if flagged down.

496 ³ Adjacent to Hudson Bay rail line.

497 ⁴ Footprints for future projects are based on available information and may change as plans become more refined
 498 and based on actual construction practices.

499 ⁵ Footprint was revised after EIS was filed as per document filed with Manitoba Conservation.

500 ⁶ Location of the GOT lines has not been determined (i.e., the map shows an approximate study area where they
 501 are likely to be located), but for the purposes of the analysis the study team has assumed a 240 m cleared ROW
 502 somewhere in this general vicinity.

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1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 7.5.2**
 2 **Terrestrial Environment; Page No.: N/A**

3 **CEC Rd 2 CEC-0103a**

4 **ORIGINAL PREAMBLE AND QUESTION (CEC-0022):**

5 Section 1.3.5 of the Keyask EIS Terrestrial Environment Supporting Volume presents
 6 the Local and Regional Study Areas, each generally consisting of three Study Zones (see
 7 Map 2-1 of the Keyask EIS Terrestrial Environment Supporting Volume).

8 It was stated that:

9 *“Due to the manner in which it was derived, the Regional Study Area was generally used*
 10 *as the cumulative effects assessment area.”*

11 The Local and Regional Study Areas for many of the VECs and supporting topics were
 12 Study Zones 3 and 5, respectively (see Map 1-1, Terrestrial Environment). The east-west
 13 axis of the Study Zone 5 Regional Study Area extends from Long Spruce GS to just west
 14 of Thompson. The length of the eastern axis from the proposed Keyask GS to Long
 15 Spruce GS is approximately 50 km, whereas the length of the western axis from the
 16 proposed Keyask GS to west of Thompson is approximately 190 km, i.e., 3.6 times
 17 longer.

18 For most EAs, the Project Footprint is the centroid for the delineation of its study areas.

19 With the truncation of the Study Zone 5 Regional Study Area at Long Spruce GS, an
 20 assessment of the terrestrial environment components further east that have been
 21 affected by existing developments or would be affected by future developments was
 22 not undertaken.

23 Existing developments outside of Study Zone 5 include (for reference see Map 2 from
 24 the BiPole Transmission Project, called “Location of Existing and Proposed BiPole III
 25 Developments Outside Proposed Keyask Project Terrestrial Study Areas”):

- 26 · Community of Bird;
- 27 · Limestone GS;
- 28 · transmission lines between Limestone GS and Henday CS;
- 29 · transmission lines between Long Spruce GS Henday CS;
- 30 · Henday CS and the northern end of Bipole II;
- 31 · further northern extension of the KN36 transmission line;
- 32 · further northeastern extensions of the CN rail line and the abandoned rail line;
- 33 · further northeastern extension of Highway 290;

- 34 · Conawapa Road;
- 35 · access roads and trails;
- 36 · cutlines; and
- 37 · cleared, borrow and other disturbed areas.

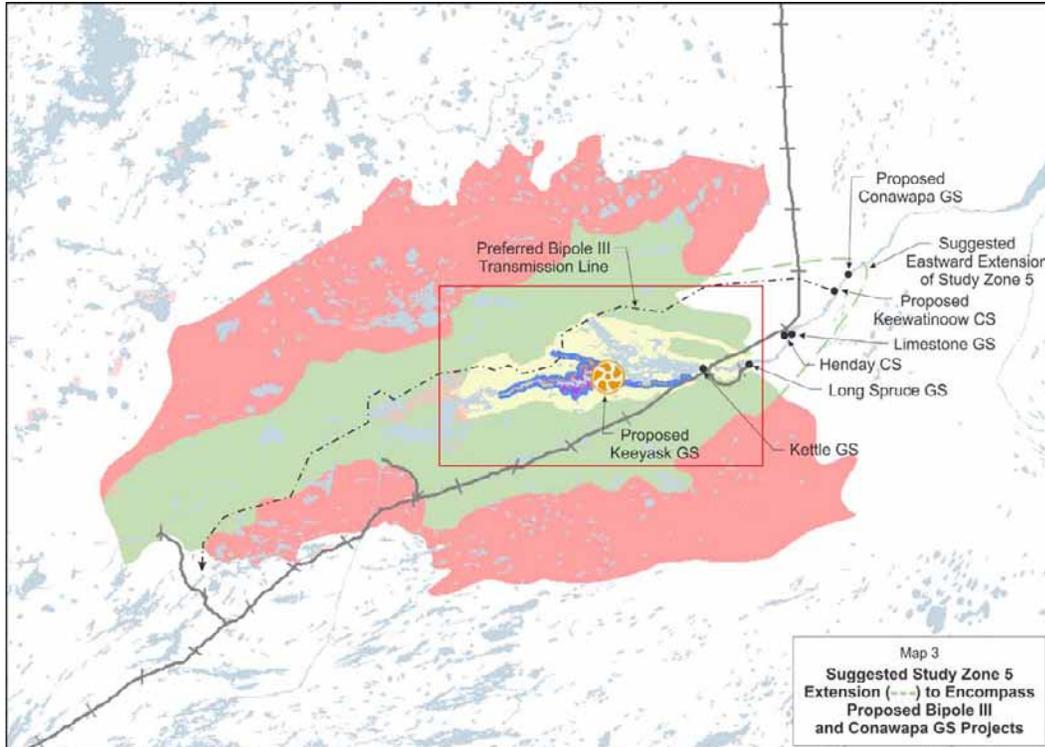
38 Proposed developments outside of Study Zone 5 include:

- 39 · many of the Bipole III Transmission Project components including:
 - 40 ○ the Keewatinoow Ground Electrode Site; o the Ground Electrode Line; o the
 - 41 Keewatinoow CS;
 - 42 ○ most of the AC collector line from Long Spruce GS to Henday CS;
 - 43 ○ the five AC collector lines from Henday CS to the Keewatinoow CS;
 - 44 ○ the construction power line from Henday CS to the construction camp site; o
 - 45 the start-up and main construction camp sites;
 - 46 ○ the work area site;
 - 47 ○ the borrow and excavated material placement areas;
 - 48 ○ an approximate 60-km section of the Bipole III HVdc Transmission Line from the
 - 49 Keewatinoow CS to the eastern limit of Study Zone 5; and
- 50 · the Conawapa GS, with a smaller inundation area but likely larger construction and
- 51 infrastructure footprint than the proposed Keeyask GS. It should be noted that there
- 52 is a westward indentation of Study Zone 5 resulting in additional exclusion of the
- 53 proposed Bipole III transmission line (see Map below).

54 An extension of the Study Zone 5 Regional Study Area approximately 60 km further
 55 northeast would have encompassed these existing and proposed developments (see
 56 Map below).

57 There is an inset figure at the top left hand side of Map 1-1 of the Keeyask Terrestrial
 58 Environment volume which delineates the Keeyask Generation Project Area, which
 59 extends the eastern boundary further east to encompass the existing and proposed
 60 developments. A suggested extension of Study Zone 5 to encompass all existing and
 61 proposed developments is presented below.

62 **Question:** The Study Zone 5 Regional Study Area should be extended approximately 60
 63 km further northeast to encompass the existing and proposed developments listed
 64 above. A suggested extension of Study Zone 5 to encompass all existing and proposed
 65 developments is presented below.



66

67 **FOLLOW-UP QUESTION:**

68 During a teleconference call on May 9, 2013 between CEC and KHLP consultants, it was
 69 strongly urged that KHLP extend Study Zone 5 Regional Study Area to encompass all
 70 existing and proposed developments to the northeast for the terrestrial environment
 71 cumulative effects assessment. KHLP indicated that the Study Zone 5 boundary reflected
 72 the boundary between two distinct ecoregions: Hayes River Upland to the west and
 73 Hudson Bay Lowland to the east. KHLP opined that this ecologically-based boundary
 74 encompassed the potential effects of the proposed Keeyask Generation Project as it
 75 extended from Thompson where most of the Project-related traffic will originate to
 76 Radisson Converter Station, the terminus of the proposed Keeyask Transmission Project.
 77 As such, Study Zone 5 provided the basis for the assessment of cumulative effects on
 78 terrestrial VECs.

79 The CEC consultant opined that the ecoregion boundary does not define genetically
 80 distinct populations of animal VECs, nor preclude their movement from one ecoregion
 81 to the other. Therefore, as there will be adverse impacts on populations of specific VECs,
 82 e.g., habitat loss, due to the Keeyask Generation Project in the Hayes River Upland
 83 ecoregion, there will be additional adverse impacts to these populations in the adjacent
 84 Hudson Bay Lowland ecoregion due to the past, existing and future projects within the
 85 ecoregion. The combination of adverse impacts in both ecoregions would have a
 86 cumulative effect on these populations.

87 KHL P responses to CEC-IR-022 are summarized below, each followed by an additional
88 information requests.

89 KHL P RESPONSE 1: "The primary justification offered in the question for the proposed
90 extension is to encompass the identified existing and future developments in this area,
91 however, such an extension is not required to ensure that these other existing and
92 future projects are properly considered in the assessment of the Project's cumulative
93 effects."

94 ADDITIONAL CEC QUESTION TO RESPONSE 1:

95 If these other existing and future projects are not included in an expanded Study Zone 5
96 how can they be "properly considered in the assessment of the Project's cumulative
97 effects"?

98 **RESPONSE:**

99 The original response addressed this question and provided examples as to how the
100 selected Regional Study Areas (which include Study Zone 5) have not limited
101 consideration of potential cumulative effects on the VECs from current or future actions
102 that may occur outside Study Zone 5 (such as the proposed Conawapa Generation
103 Project).

104 Before addressing this matter further, it is noted that the preamble to the follow-up
105 question omits or incorrectly summarizes a number of key points made by the
106 Partnership. First, the destination for construction traffic from Thompson will either be
107 the construction camp or Gillam, rather than the Radisson Converter Station. Second,
108 the relevance of the eastern boundaries of Study Zones 4 and 5 was associated with
109 Ecozone (i.e., the Boreal Shield and Hudson Plains) rather than Ecoregion boundaries,
110 and that some Ecozone boundaries represent rapid changes in ecological conditions
111 while others represent gradual transitions. Third, a more complete rationale for the
112 Study Zone boundaries was provided. Fourth, the Partnership agreed with the CEC
113 consultant that the Ecozone boundary does not define genetically distinct populations
114 of animal VECs, nor preclude animal movements from one Ecozone to the other.
115 Partnership representatives noted that defining a practical approach to addressing
116 species with non-isolated populations in an environmental assessment was a key
117 component of the study area methodology. This fourth point is particularly relevant for
118 the response to this question.

119 In summary, the effects of existing and potential future developments that are
120 physically located outside of a VEC's Regional Study Area are properly considered in
121 each VEC cumulative effects assessment without expanding Study Zone 5 (or any other

122 Study Zone used as a Regional Study Area) eastwards past the proposed Conawapa
123 generating station site because:

- 124 · The Keeyask Project terrestrial effects assessment focuses on the regional
125 ecosystem and on the VEC populations that are expected to experience more than
126 very minor effects from the Keeyask Project. It is not necessary for a project effects
127 assessment to explicitly evaluate every single theoretically possible or very minor
128 potential Project effect on populations located in other regions; and
- 129 · A development does not have to be physically located within a VEC's Regional Study
130 Area in order for effects from that development to be evaluated as a cumulative
131 effect on the VEC populations relevant for a project effects assessment. To the
132 extent that future projects located in other regions could affect Keeyask wildlife
133 populations, these effects were considered, to the extent reasonable, in the
134 cumulative effects assessment regardless of whether or not the physical footprints
135 of the future projects are in the VEC's Regional Study Area.

136 To expand on these two points, the study area methodology that was outlined at some
137 length in the original response is restated here in an alternative way that highlights how
138 the effects of developments located outside of a VEC's Regional Study Area are
139 considered. This summary addresses key points. Attachment A provides further details,
140 including how the regional ecosystem was delineated, how the six study zones were
141 linked with the regional ecosystem and how the Regional Study Areas for the relevant
142 VEC populations were selected from the six study zones.

143 Elements of the Study Area Approach

144 The study area approach, which is part of the overall regional, ecosystem-based
145 approach to the terrestrial assessment, has two key elements: delineate a regional
146 ecosystem that encompasses the Project impact areas (e.g., clearing, flooding, noise,
147 traffic, improved access); and, delineate ecologically meaningful regional study areas for
148 the VEC populations that overlap the Project impact areas.

149 A regional ecosystem was needed for the ecosystem VECs (e.g., ecosystem diversity,
150 intactness) to implement a regional, ecosystem-based approach to the cumulative
151 effects assessment. A regional ecosystem is an area that is large enough to support the
152 dominant natural disturbance regime and populations of most resident wildlife species.

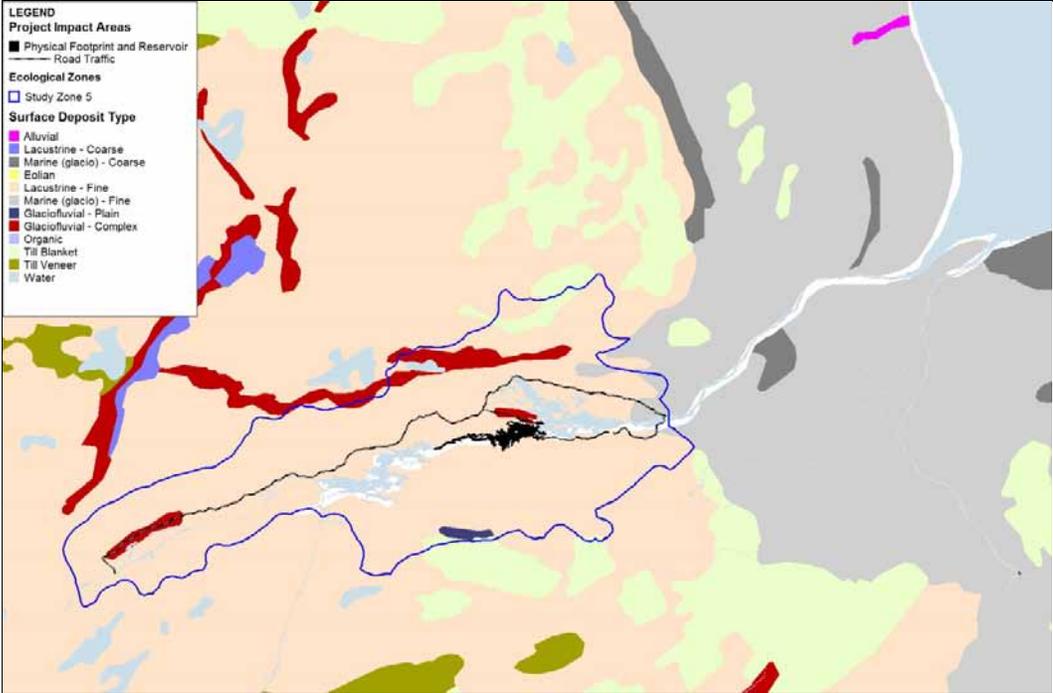
153 A regional ecosystem spans an area that is relatively homogenous in ecological terms
154 and is large enough to maintain a relatively stable habitat composition in the context of
155 the wildfire regime so that one large fire is unlikely to substantially change the
156 proportion of any habitat type, which means that alternative habitat is available for
157 animals to move to when large fires occur.

158 The following explains how boundaries for the regional ecosystem and the other Study
 159 Zones were delineated, which is followed by an explanation of how the wildlife VECs
 160 were related to these Study Zones.

161 Delineate Regional Ecosystem and Other Study Zones

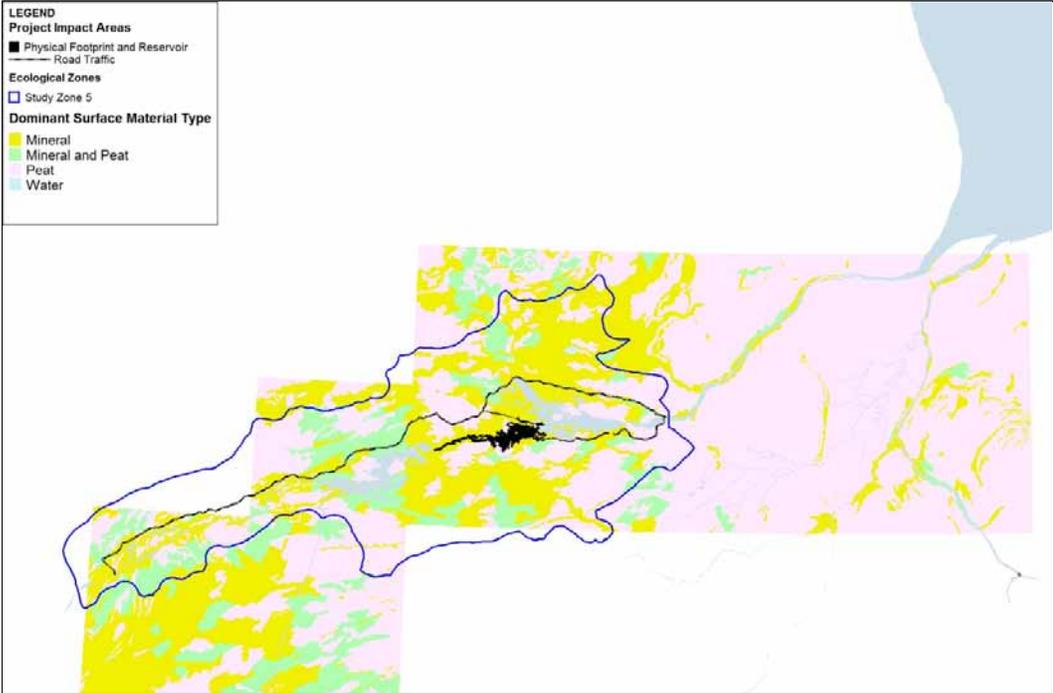
162 The standard approach for mapping ecosystems for various purposes is to use changes
 163 in dominant ecological conditions (e.g., Ecological Stratification Working Group. 1996;
 164 Bailey 2009). Major changes in dominant ecological conditions, such as climate or
 165 surface materials, can occur over distances of 50 to 100 kilometers. A distinct, or
 166 narrow, transition zone occurs at the eastern boundary of Study Zone 5 because the
 167 limits of the Tyrrell Sea marine deposition zone occur here (coincides with the western
 168 limit of the grey area in Figure 1). Surface material composition and topography is flatter
 169 in the marine deposition zone compared with areas to the west. Since surface materials
 170 and topography influence soil development, mapping demonstrates how the dominant
 171 soil types also change at the eastern boundary of Study Zone 5 (Figure 2). Vegetation is
 172 in turn influenced by soils and site conditions. While vegetation mapping for the areas
 173 shown in Figure 2 is not presently available for areas to the east of Study Zone 5, boreal
 174 research has generally found that site conditions are the primary determinant for stand
 175 level vegetation composition, and this has been verified for a portion of the Manitoba
 176 Boreal Shield (Ehnes 1998). On this basis, it is expected that the vegetation composition
 177 of the areas to the east of Study Zone 5 will be different from that within this study
 178 zone. Smith et al. (1998) support this inference with their description of vegetation and
 179 other ecological conditions in the two Ecodistricts located on either side of this
 180 boundary (summarized in Table 1). Large differences in climate (Table 1), surface
 181 materials (Figure 1) and dominant soils (Figure 2) are also expected to produce different
 182 fire regimes, and this has been confirmed by a fire history analysis (ECOSTEM unpubl.
 183 results). All of these ecological differences become more pronounced when moving east
 184 and west from the Study Zone 5 boundary. That is, ecological conditions in the
 185 Conawapa area are even more different than those found west of Stephens Lake.

186 The distinct ecological boundary produced by the Tyrrell Sea marine deposition zone
 187 (Figure 1) is a strong ecological basis for delineating the eastern boundary of the
 188 regional ecosystem, as well as the study zones used for the other VEC Regional Study
 189 Areas. This boundary generally coincides with where the Hudson Plains Ecozone meets
 190 the Boreal Shield and Taiga Shield Ecozones in the Keeyask area (Ecological Stratification
 191 Working Group 1996). It is clarified here that the eastern boundary of Study Zone 5 was
 192 delineated based on changes in dominant ecological conditions as opposed to using an
 193 Ecozone boundary. In fact, portions of the Ecozone and Study Zone 5 boundaries
 194 coincide for the same reason.



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Figure 1. Dominant surface materials in the Lower Nelson River region.
Source: Fulton (1995).



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200

Figure 2. Dominant soil type in the Lower Nelson River region.
Source: Agriculture & Agri-food Canada (2004).

Table 2. Summarized characterization of ecological conditions in the Ecodistricts bordering either side of the eastern boundary of Study Zone 5 from Smith et al. (1998).

Ecological Attribute	Study Zone 5: Boreal Shield Ecozone- Knee Lake Ecodistrict	East of Study Zone 5: Hudson Plains Ecozone- Winisk River Lowland Ecodistrict
Vegetation	Black spruce dominated, with jack pine common, often on dry, sandy soils and bedrock outcrops. Trembling aspen occurs locally throughout. Stunted black spruce with sphagnum, other mosses and ericaceous shrubs on bog peatlands, and sedge, brown mosses, shrubs and stunted tamarack on fens.	Stunted black spruce forest on bogs with Labrador tea, other ericaceous shrubs, mosses and lichens. Fens with sedges, brown mosses, dwarf birch, willow and stunted tamarack. Mineral soils with taller denser black spruce, with alder, willow, ericaceous shrubs, mosses and lichens
Climate	High Boreal Ecoclimatic Region Mean annual temp: -4.1°C Precipitation: 500 mm Cold, subhumid to humid, Cryoboreal soil climate	Low Subarctic Ecoclimatic Region Mean annual temp: -2.5°C Precipitation: Variable, 690 mm Very cold, humid, Subarctic soil climate
Surficial deposits and landforms	Undulating to ridged, loamy morainal plain; water eroded drumlin crests with concentrations of boulders and stony lags; gently sloping veneer bogs over glaciolacustrine blankets common. Peat plateau bogs and patterned fens occupy depressional terrain. Local areas of prominent, kettled fluvioglacial deposits rising 20 to 30m above plain.	Flat, wetland dominated plain; widespread permafrost in bog peatlands, lacking in fen peatlands; widespread thermokarsting. Complex of peat plateau and string bogs, and horizontal and northern ribbed fens.
Soils	Dominated by Organic Cryosols with widespread permafrost in veneer and peat plateau bogs. Deep to shallow Fibrisols and Mesisols in non-frozen bogs and fens. Significant areas of mineral soils with Eutric Brunisols on loamy to sandy calcareous till and sandy to gravelly fluvioglacial deposits. Gray Luvisols on clayey deposits.	Dominated by Organic Cryosols and deep Mesisols and Fibrisols overlaying clayey and silty glaciolacustrine and marine sediments. Local areas of mineral with Eluviated Eutric Brunisols, usually on raised marine beaches and fluvioglacial deposits.

201 With the western limit of the Tyrrell Sea marine deposition zone (Figure 2) as a
 202 constraint, the general approach to delineating the remaining boundaries for the
 203 regional ecosystem was to select Soil Landscapes of Canada (SLC; Agriculture and Agri-
 204 Food Canada 1996) polygons², starting with those that intersected the Project impact
 205 areas and then continuing outwards from the Project impact areas until the pre-

² SLC polygons represent relatively homogenous areas in terms of surface materials, etc..

206 determined required size for the regional ecosystem was reached. Because some SLC
 207 polygons are very large, drainage basin boundaries were used to truncate portions of
 208 polygons that are distant from the Project impact areas. The exception to this general
 209 approach was that a small portion of Study Zone 5 overlaps the marine deposition zone
 210 so the boundary was extended here to capture all of the Project impact areas.

211 As reviewed in the response to CEC Rd 1 CEC-0022, ecological criteria were used to
 212 delineate five other Study Zones for use as Local or Regional Study Areas for the
 213 terrestrial VECs and supporting topics.

214 Delineate Ecologically Meaningful Regional Study Areas for VEC Populations

215 The second element of the study area component of the regional, ecosystem based
 216 approach to the terrestrial effects assessment emphasizes the populations impacted by
 217 the Project. Standard environmental assessment practice does not include quantifying
 218 or even explicitly evaluating every single theoretically possible or very minor potential
 219 Project effect. For example, a person driving from southern Ontario to work on the
 220 Project could collide with and kill a beaver in northwestern Ontario while en route. As is
 221 standard environmental assessment practice, the Project effects assessment does not
 222 quantify effects on the affected beaver population in northwestern Ontario, nor does it
 223 add this mortality to beaver mortality in the Keeyask region.

224 Selecting a wildlife VEC does not mean that cumulative effects are being assessed for
 225 every individual of that species in North America, Manitoba or even in northern
 226 Manitoba. In essence, the approach is to focus on populations in ecological regions as
 227 the means of maintaining a species across its range. The terrestrial assessment
 228 evaluates cumulative effects on the populations that the Project affects in more than
 229 very minor ways (referred to as directly affected). That is, Project-related mortality of a
 230 single or a few individuals belonging to populations not directly affected by the Keeyask
 231 Project is not evaluated because the species is widespread throughout the intact boreal
 232 forest and populations are self-sustaining in regions where resource harvesting is not
 233 excessive, and therefore any potential Project effects on those populations and the
 234 species is expected to be very minor.

235 The beaver example portrays the typical situation for many wildlife species found in the
 236 Keeyask area. For an endangered species, Project-related mortality on a population not
 237 directly affected by the Keeyask Project would have been explicitly considered if any
 238 such species had ranges that overlapped the Keeyask regional ecosystem. The loss of
 239 even a few individuals could contribute to the extinction of an endangered species.

240 For a species that is vulnerable to becoming endangered, the assessment focuses on the
 241 regional population or populations affected by the Project to more than a very minor

242 degree (referred to as directly affected) as the appropriate strategy for maintaining the
243 species across its range. The risk is low that potential Project-related mortality of a few
244 individuals belonging to populations in other regions would increase the vulnerability of
245 the species if those effects are not detectable at the regional population level.
246 Nevertheless, as a precautionary measure, overall species trends and the potential for
247 Project effects on populations located in other ecological regions are also considered
248 during the ecological context assessment for species that are vulnerable to becoming
249 endangered, which is why all VECs listed as threatened or of special concern under SARA
250 (or being considered for such listing based on a COSEWIC recommendation when the EIS
251 was filed) undergo an ecological context evaluation in Step 2 of the regulatory
252 significance assessment of predicted residual adverse effects (Response to EIS
253 Guidelines Chapter 5.5). Please see response to TAC Public Rd 1 EC-0032b for an
254 example of how this was evaluated for boreal woodland caribou.

255 On this basis, two early steps in the effects assessment for each wildlife VEC are to
256 identify which population or populations will be considered, and to then define the
257 spatial extents that capture those population(s). Identifying the populations to be
258 considered is relatively straightforward for a species with a herding or colonial behavior.
259 Figure 3 conceptually illustrates this situation assuming that caribou is used as a VEC in
260 an assessment. In this example, which uses hypothetical long-term ranges (i.e., areas
261 occupied by the population over the entire fire cycle) for three hypothetical caribou
262 herds, the focus of the environmental assessment would be cumulative effects on
263 caribou herd C, both in terms of total cumulative effects and the project's incremental
264 contribution to those effects. Cumulative effects on Caribou Herds A and B would not be
265 evaluated in this project effects assessment because the project is not expected to
266 affect those herds. Having determined that caribou herd C is the focus of the caribou
267 VEC assessment, either the range of caribou herd C or an equivalent area would be the
268 Caribou Regional Study Area for the Project effects assessment in this hypothetical
269 situation. Equivalent area is used as an option for herding or colonial species because
270 the data required to map long-term population range is rarely available (this is
271 particularly true for the Keeyask summer resident caribou).

272 Individuals of most terrestrial wildlife species in the Manitoba boreal forest do not
273 cluster into geographically distinct groups due to behavior and/or environmental
274 conditions that isolate large groups of individuals. The more common situation is that
275 individual animal home ranges are essentially contiguous so that geographically distinct
276 populations do not exist. That is, adjacent individual home ranges essentially form one
277 large continuous species range across the Manitoba boreal forest. Using beaver as an
278 example, Figure 4 conceptually illustrates this more common situation where individual
279 animals or families have contiguous, or even overlapping, home ranges that virtually
280 span the entire intact North American boreal forest.

281 For a species whose distribution essentially consists of contiguous individual home
282 ranges, a project environmental assessment would not use the entire intact North
283 American boreal forest as its cumulative effects assessment study area. An
284 environmental assessment has to draw practical boundaries. The terrestrial assessment
285 uses an area that is large enough to maintain a viable population to determine the
286 Regional Study Area size. In the case of species such as songbirds that have small
287 individual home ranges, Project impacts are evaluated as overlapping multiple
288 populations, and the Regional Study Area size for these species is large enough to
289 capture multiple populations.

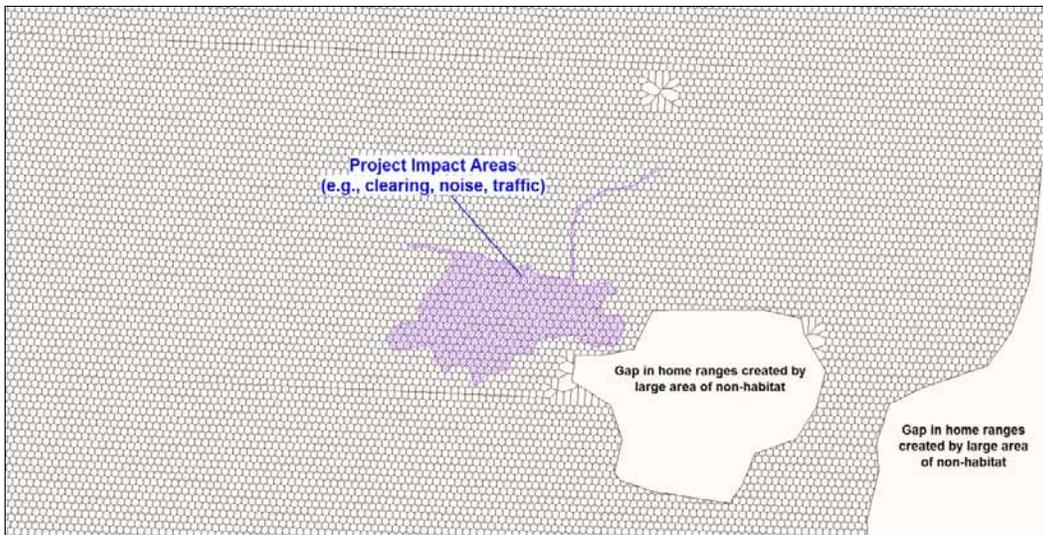
290 Once the total area required to capture a viable VEC population was determined, the
291 next step for the terrestrial assessment was to delineate study area boundaries that
292 captured the required area. To support the regional, ecosystem-based approach used
293 for the terrestrial assessment, and for higher consistency in results presentation, the
294 Study Zone (see above) appropriate to capture a population for the VEC was selected as
295 the VEC's Regional Study Area. Additional study areas are used for VEC populations
296 known to have geographically isolated ranges (e.g., Pen Islands caribou) or to evaluate
297 special circumstances (e.g., the moose assessment also uses the Split Lake RMA to
298 address the spatial extent of the TCN adverse effects agreement).

299 On this basis, the assessment evaluates the VEC populations directly affected by the
300 Keeyask Project, rather than using a study area delineated by the locations of all past,
301 current and future projects to assess effects on VECs. When applying the VEC-centric
302 approach used in the terrestrial assessment, another project or development does not
303 have to be physically located within a VEC's Regional Study Area in order for effects
304 from that development to be evaluated as a cumulative effect with the Project.



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Figure 3. Population ranges for hypothetical caribou herds, and their relation to a project's impact areas.



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Figure 4. Hypothetical individual home ranges for beavers, and their relation to a project's impact areas. Notes: Each hexagon is a hypothetical individual home range. Actual ranges are varied in shape. Also, although gaps in contiguous ranges are more frequent in nature, the basic point that ranges are connected with each other over the landscape stands.

312 How the Cumulative Effects of Projects Physically Located Outside of a VEC's Regional
 313 Study Area are Considered

314 Returning to the follow-up question, the effects of projects physically located outside of
 315 a VEC's Regional Study Area are considered as follows. For the ecosystem VECs (e.g.,
 316 intactness, ecosystem diversity), clearing and physical disturbance located outside of
 317 the regional ecosystem (i.e., Study Zone 5) neither reduces the total amount of any
 318 terrestrial habitat type nor changes its spatial arrangement in the regional ecosystem
 319 directly affected by the Project. In contrast, road dust generated by construction traffic
 320 going to projects physically located outside of the regional ecosystem could affect
 321 vegetation in the Keeyask region where it passes through the region. Consequently, this
 322 latter impact from projects physically located outside of the regional ecosystem is
 323 evaluated as a cumulative effect on ecosystem diversity (as is past and current vehicle
 324 traffic on the portion of PR 280 that passes through the Regional Study Area). The
 325 inclusion test for impacts from projects physically located outside of the Keeyask
 326 regional ecosystem is whether or not any of their effects have spatial and temporal
 327 overlap with cumulative effects on intactness, ecosystem diversity or wetland function
 328 (i.e., the ecosystem VECs) in the regional ecosystem directly affected by the Project.

329 The approach is the same for wildlife VECs. With two exceptions, it is highly unlikely that
 330 Conawapa Generation impacts (e.g., clearing, flooding, erected transmission lines) will
 331 affect the same VEC populations that are directly affected by Keeyask. On the other
 332 hand, Conawapa Generation Project construction traffic could kill or injure some
 333 individuals belonging to the populations affected by Keeyask. Using beaver as an
 334 example, the effects of future Conawapa construction traffic travelling from Winnipeg
 335 to the Conawapa site are considered where this traffic strikes a beaver that is a member
 336 of the beaver population directly affected by the Keeyask Project. In practical terms, the
 337 spatial overlap of effects from other projects is searched for using the VEC's Regional
 338 Study Area boundaries (e.g., where the traffic passes through the Beaver Regional Study
 339 Area; Attachment A details how Regional Study Areas are delineated based on long-
 340 term population range).

341 The two exceptions being referred to in the first sentence of the previous paragraph are
 342 geese and the Pen Islands caribou, which is why these assessments used an additional
 343 study area. For both of these exceptions, and based on what is thought to be their
 344 current population range, numerous individuals from the population relevant for the
 345 Project are expected to temporarily occupy the impact areas of projects physically
 346 located outside of their Regional Study Areas.

347 In summary, to the extent that future projects located in other regions could affect the
 348 wildlife populations directly affected by the Project, these effects were considered to
 349 the extent reasonable in the cumulative effects assessment regardless of whether or not

350 the physical footprints of the future projects are located in the VEC's Regional Study
351 Area.

352 The concern regarding past and future cumulative effects on ecosystems and
353 populations in the broader Lower Nelson River region is appreciated. There is no doubt
354 that past and current projects and activities have had cumulative effects on the
355 terrestrial ecosystems and populations in the area likely to be affected by Conawapa.
356 However, except for geese and the Pen Islands caribou, Keeyask Project effects on the
357 terrestrial ecosystems and populations in the area likely to be affected by Conawapa are
358 not evaluated because detectable Keeyask effects are not expected to extend this far for
359 the remaining terrestrial VECs.

360 **REFERENCES:**

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1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 7.5.2**
 2 **Terrestrial Environment; Page No.: N/A**

3 **CEC Rd 2 CEC-0103b**

4 **ORIGINAL PREAMBLE AND QUESTION (CEC-0022):**

5 Section 1.3.5 of the Keyask EIS Terrestrial Environment Supporting Volume presents
 6 the Local and Regional Study Areas, each generally consisting of three Study Zones (see
 7 Map 2-1 of the Keyask EIS Terrestrial Environment Supporting Volume).

8 It was stated that:

9 *“Due to the manner in which it was derived, the Regional Study Area was generally used*
 10 *as the cumulative effects assessment area.”*

11 The Local and Regional Study Areas for many of the VECs and supporting topics were
 12 Study Zones 3 and 5, respectively (see Map 1-1, Terrestrial Environment). The east-west
 13 axis of the Study Zone 5 Regional Study Area extends from Long Spruce GS to just west
 14 of Thompson. The length of the eastern axis from the proposed Keyask GS to Long
 15 Spruce GS is approximately 50 km, whereas the length of the western axis from the
 16 proposed Keyask GS to west of Thompson is approximately 190 km, i.e., 3.6 times
 17 longer.

18 For most EAs, the Project Footprint is the centroid for the delineation of its study areas.

19 With the truncation of the Study Zone 5 Regional Study Area at Long Spruce GS, an
 20 assessment of the terrestrial environment components further east that have been
 21 affected by existing developments or would be affected by future developments was
 22 not undertaken.

23 Existing developments outside of Study Zone 5 include (for reference see Map 2 from
 24 the BiPole Transmission Project, called “Location of Existing and Proposed BiPole III
 25 Developments Outside Proposed Keyask Project Terrestrial Study Areas”):

- 26 · Community of Bird;
- 27 · Limestone GS;
- 28 · transmission lines between Limestone GS and Henday CS;
- 29 · transmission lines between Long Spruce GS Henday CS;
- 30 · Henday CS and the northern end of Bipole II;
- 31 · further northern extension of the KN36 transmission line;
- 32 · further northeastern extensions of the CN rail line and the abandoned rail line;
- 33 · further northeastern extension of Highway 290;

- 34 · Conawapa Road;
- 35 · access roads and trails;
- 36 · cutlines; and
- 37 · cleared, borrow and other disturbed areas.

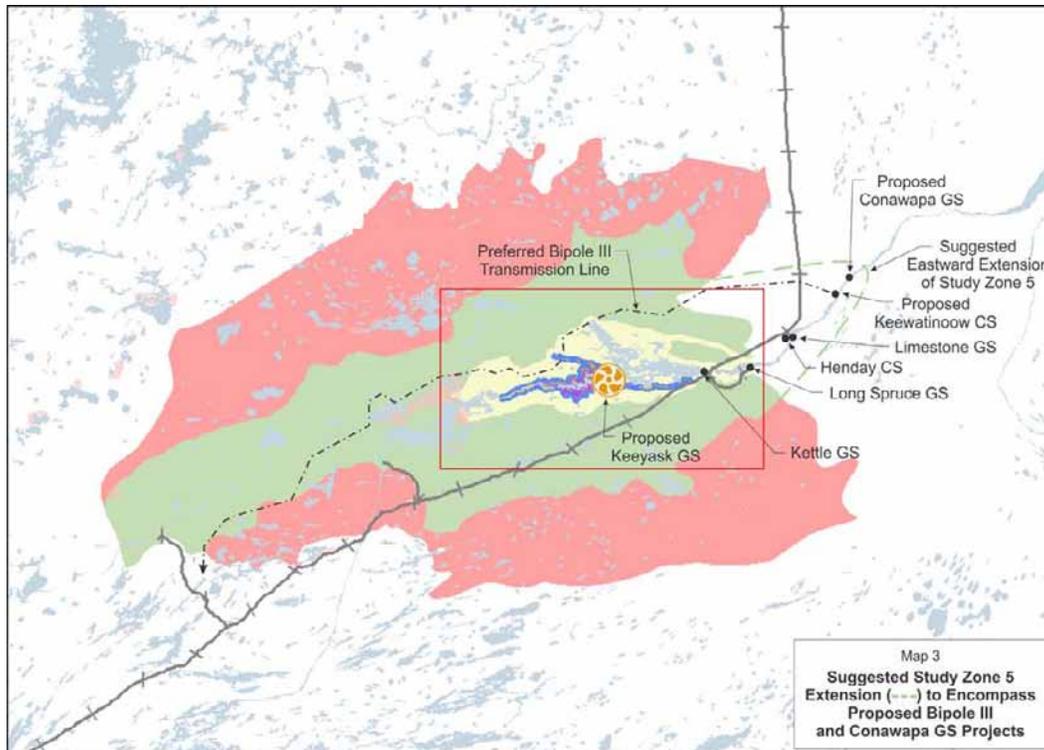
38 Proposed developments outside of Study Zone 5 include:

- 39 · many of the Bipole III Transmission Project components including:
 - 40 ○ the Keewatinoow Ground Electrode Site; o the Ground Electrode Line; o the
 - 41 Keewatinoow CS;
 - 42 ○ most of the AC collector line from Long Spruce GS to Henday CS;
 - 43 ○ the five AC collector lines from Henday CS to the Keewatinoow CS;
 - 44 ○ the construction power line from Henday CS to the construction camp site; o
 - 45 the start-up and main construction camp sites;
 - 46 ○ the work area site;
 - 47 ○ the borrow and excavated material placement areas;
 - 48 ○ an approximate 60-km section of the Bipole III HVdc Transmission Line from the
 - 49 Keewatinoow CS to the eastern limit of Study Zone 5; and
- 50 · the Conawapa GS, with a smaller inundation area but likely larger construction and
- 51 infrastructure footprint than the proposed Keeyask GS. It should be noted that there
- 52 is a westward indentation of Study Zone 5 resulting in additional exclusion of the
- 53 proposed Bipole III transmission line (see Map below).

54 An extension of the Study Zone 5 Regional Study Area approximately 60 km further
 55 northeast would have encompassed these existing and proposed developments (see
 56 Map below).

57 There is an inset figure at the top left hand side of Map 1-1 of the Keeyask Terrestrial
 58 Environment volume which delineates the Keeyask Generation Project Area, which
 59 extends the eastern boundary further east to encompass the existing and proposed
 60 developments. A suggested extension of Study Zone 5 to encompass all existing and
 61 proposed developments is presented below.

62 The Study Zone 5 Regional Study Area should be extended approximately 60 km further
 63 northeast to encompass the existing and proposed developments listed above. A
 64 suggested extension of Study Zone 5 to encompass all existing and proposed
 65 developments is presented below.



66

67 **FOLLOW-UP QUESTION:**

68 During a teleconference call on May 9, 2013 between CEC and KHLP consultants, it was
 69 strongly urged that KHLP extend Study Zone 5 Regional Study Area to encompass all
 70 existing and proposed developments to the northeast for the terrestrial environment
 71 cumulative effects assessment. KHLP indicated that the Study Zone 5 boundary reflected
 72 the boundary between two distinct ecoregions: Hayes River Upland to the west and
 73 Hudson Bay Lowland to the east. KHLP opined that this ecologically-based boundary
 74 encompassed the potential effects of the proposed Keeyask Generation Project as it
 75 extended from Thompson where most of the Project-related traffic will originate to
 76 Radisson Converter Station, the terminus of the proposed Keeyask Transmission Project.
 77 As such, Study Zone 5 provided the basis for the assessment of cumulative effects on
 78 terrestrial VECs.

79 The CEC consultant opined that the ecoregion boundary does not define genetically
 80 distinct populations of animal VECs, nor preclude their movement from one ecoregion
 81 to the other. Therefore, as there will be adverse impacts on populations of specific VECs,
 82 e.g., habitat loss, due to the Keeyask Generation Project in the Hayes River Upland
 83 ecoregion, there will be additional adverse impacts to these populations in the adjacent
 84 Hudson Bay Lowland ecoregion due to the past, existing and future projects within the
 85 ecoregion. The combination of adverse impacts in both ecoregions would have a
 86 cumulative effect on these populations.

87 KHL P responses to CEC-IR-022 are summarized below, each followed by an additional
88 information requests.

89 KHL P RESPONSE 2: "The Study Zone 5 boundaries are considered to be appropriate for
90 use as the regional and cumulative effects assessment study areas for most of the
91 terrestrial VECs because:

- 92 · Study Zone 5 boundaries follow ecosystem boundaries, which is a prerequisite for
93 employing an ecosystem-based approach to Project and cumulative effects
94 assessment."

95 Could you please confirm that Study Zone 5 does not only overlap Hayes River Upland
96 ecoregion of the Boreal Shield ecozone, but also the Churchill River Upland ecoregion of
97 the Boreal Shield ecozone?

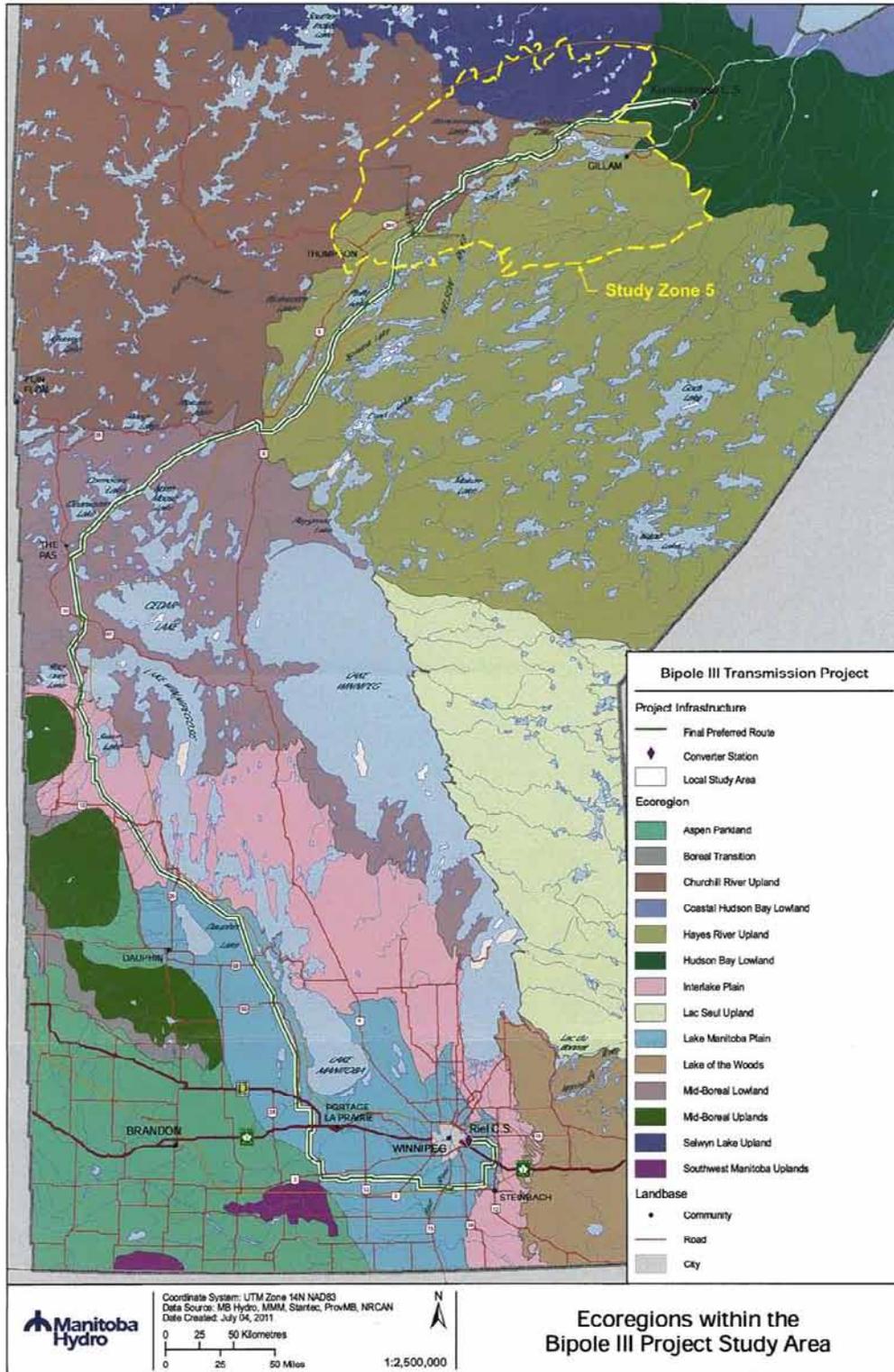
98 Could you also confirm that Study Zone 5 also overlaps another ecoregion associated
99 with a different ecozone, i.e., Selwyn Lake Upland ecoregion of the Taiga Shield
100 ecozone?

101 Could you also confirm that a small area of Study Zone 5 west of Limestone GS overlaps
102 the Hudson Bay Lowland ecoregion of the Hudson Plains ecozone, i.e., the ecoregion
103 that Study Zone 5 is not to overlap? The attached map may assist in KHL P's responses to
104 these questions.

105 As Study Zone 5 overlaps an ecoregion (Selwyn Lake Upland) in a different ecozone
106 (Taiga Shield), why did KHL P extend Study Zone 5 further east to encompass all past,
107 current and future developments in Hudson Bay Lowland ecoregion?

108 Would inclusion of these developments into Study Zone 5 result in more adverse
109 cumulative effects on the terrestrial VECs?

110 Could KHL P provide a quantitative cumulative effects assessment for the terrestrial VECs
111 and supporting topics that includes these developments in Study Zone 5?



112

113 **RESPONSE:**

114 The response is provided separately below for different parts of the above question.

115 *Could you please confirm that Study Zone 5 does not only overlap Hayes River Upland*
 116 *ecoregion of the Boreal Shield ecozone, but also the Churchill River Upland ecoregion of*
 117 *the Boreal Shield ecozone? Could you also confirm that Study Zone 5 also overlaps*
 118 *another ecoregion associated with a different ecozone, i.e., Selwyn Lake Upland*
 119 *ecoregion of the Taiga Shield ecozone? Could you also confirm that a small area of Study*
 120 *Zone 5 west of Limestone GS overlaps the Hudson Bay Lowland ecoregion of the Hudson*
 121 *Plains ecozone, i.e., the ecoregion that Study Zone 5 is not to overlap? The attached map*
 122 *may assist in KHLP's responses to these questions. As Study Zone 5 overlaps an ecoregion*
 123 *(Selwyn Lake Upland) in a different ecozone (Taiga Shield), why did KHLP extend Study*
 124 *Zone 5 further east to encompass all past, current and future developments in Hudson*
 125 *Bay Lowland ecoregion?*

126 Please note that the map provided with the follow-up information request has overlaid
 127 Study Zone 6 rather than Study Zone 5 on the map. Study Zone 5 land area is less than
 128 half of that in Study Zone 6.

129 Regarding the remaining questions, the response to CEC Rd 2 CEC-0103a explains that
 130 the key distinction being made relates to distinct ecozone boundaries rather than
 131 ecoregion boundaries. Please see the response to CEC Rd 2 CEC-0103a for the
 132 explanation of why Study Zone 5 overlaps more than one ecoregion, the Boreal Shield
 133 and Taiga Shield Ecozone,; a small portion of the Hudson Plains Ecozone, and the
 134 Hudson Bay Lowland ecoregion.

135 *Would inclusion of these developments into Study Zone 5 result in more adverse*
 136 *cumulative effects on the terrestrial VECs?*

137 The responses to CEC Rd 2 CEC-0103a and CEC Rd 1 CEC-0022 explain how the effects of
 138 these developments have already been captured in the cumulative effects assessments
 139 for terrestrial VECs.

140 *Could KHLP provide a quantitative cumulative effects assessment for the terrestrial VECs*
 141 *and supporting topics that includes these developments in Study Zone 5?*

142 Please see the responses to CEC Rd 1 CEC-0021 and CEC Rd 2 CEC-0102c for a
 143 quantification of the cumulative effects of these developments on the VECs using
 144 various indicator measures.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 7.5.2**
 2 **Terrestrial Environment; Page No.: N/A**

3 **CEC Rd 2 CEC-0103c**

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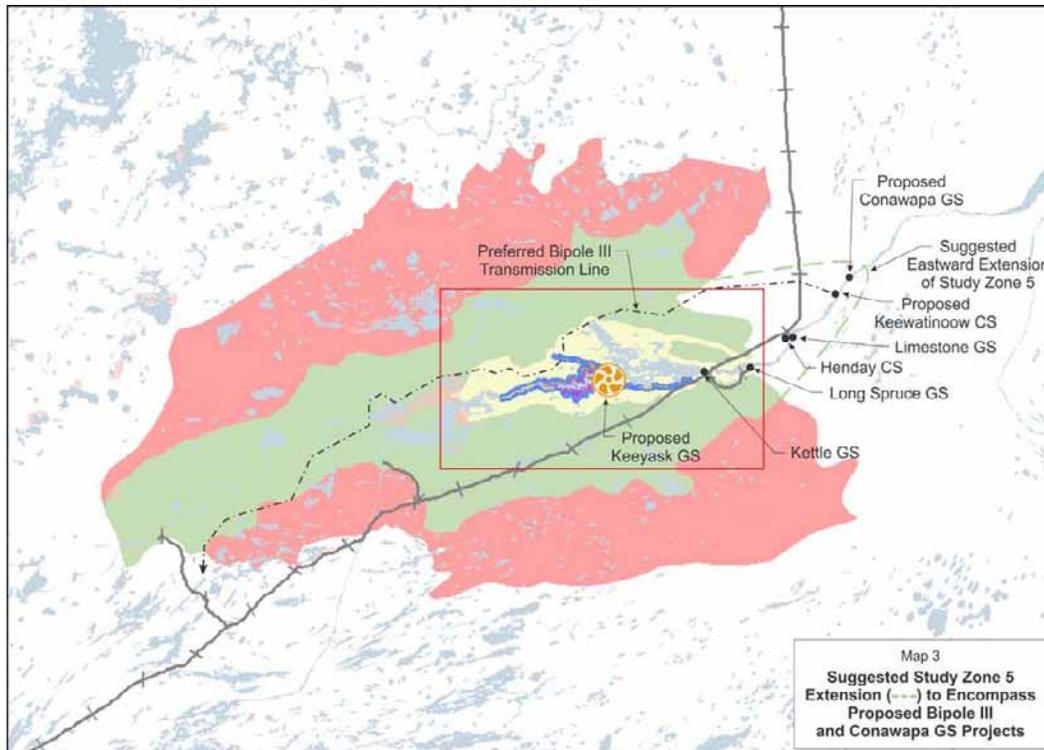
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 - 45 the start-up and main construction camp sites;
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 - 48 ○ an approximate 60-km section of the Bipole III HVdc Transmission Line from the
 - 49 Keewatinoow CS to the eastern limit of Study Zone 5; and
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- 51 infrastructure footprint than the proposed Keeyask GS. It should be noted that there
- 52 is a westward indentation of Study Zone 5 resulting in additional exclusion of the
- 53 proposed Bipole III transmission line (see Map below).

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 55 northeast would have encompassed these existing and proposed developments (see
 56 Map below).

57 There is an inset figure at the top left hand side of Map 1-1 of the Keeyask Terrestrial
 58 Environment volume which delineates the Keeyask Generation Project Area, which
 59 extends the eastern boundary further east to encompass the existing and proposed
 60 developments. A suggested extension of Study Zone 5 to encompass all existing and
 61 proposed developments is presented below.

62 The Study Zone 5 Regional Study Area should be extended approximately 60 km further
 63 northeast to encompass the existing and proposed developments listed above. A
 64 suggested extension of Study Zone 5 to encompass all existing and proposed
 65 developments is presented below.



66

67 **FOLLOW-UP QUESTION:**

68 During a teleconference call on May 9, 2013 between CEC and KHLP consultants, it was
 69 strongly urged that KHLP extend Study Zone 5 Regional Study Area to encompass all
 70 existing and proposed developments to the northeast for the terrestrial environment
 71 cumulative effects assessment. KHLP indicated that the Study Zone 5 boundary reflected
 72 the boundary between two distinct ecoregions: Hayes River Upland to the west and
 73 Hudson Bay Lowland to the east. KHLP opined that this ecologically-based boundary
 74 encompassed the potential effects of the proposed Keeyask Generation Project as it
 75 extended from Thompson where most of the Project-related traffic will originate to
 76 Radisson Converter Station, the terminus of the proposed Keeyask Transmission Project.
 77 As such, Study Zone 5 provided the basis for the assessment of cumulative effects on
 78 terrestrial VECs.

79 The CEC consultant opined that the ecoregion boundary does not define genetically
 80 distinct populations of animal VECs, nor preclude their movement from one ecoregion
 81 to the other. Therefore, as there will be adverse impacts on populations of specific VECs,
 82 e.g., habitat loss, due to the Keeyask Generation Project in the Hayes River Upland
 83 ecoregion, there will be additional adverse impacts to these populations in the adjacent
 84 Hudson Bay Lowland ecoregion due to the past, existing and future projects within the
 85 ecoregion. The combination of adverse impacts in both ecoregions would have a
 86 cumulative effect on these populations.

87 KHLP responses to CEC-IR-022 are summarized below, each followed by an additional
88 information requests.

89 KHLP RESPONSE 3:

- 90 · “Following cumulative effects assessment guidance, the VEC local and regional
91 study area boundaries are based on ecological criteria rather than the physical
92 locations of all past, current and reasonably foreseeable future actions;”

93 ADDITIONAL CEC QUESTIONS TO RESPONSE 3:

94 In establishing spatial boundaries for cumulative effects, does Hegmann et al. (1999) not
95 provide the following rules-of-thumb (see p. 14 of their document):

- 96 · “For terrestrial VECs such as vegetation and wildlife, ensure boundaries are
97 ecologically defensible wherever possible.”
98 · “Set boundaries at the point at which cumulative effects become insignificant.”
99 · “Be prepared to adjust the boundaries during the assessment process if new
100 information suggests this is warranted, and defend any such changes.”?

101 Did the ecological criteria used by KHLP ignore the significant amounts of modeled
102 habitat present in the Bipole III Transmission Project study area east of Study Zone 5 for
103 the following VECs: mallard (see Map 1200-01 of the Birds Technical Report), bald eagle
104 (Map 1500-01), olive-sided flycatcher (Map 2700-01), rusty blackbird (Map 3200-01),
105 common nighthawk (Map 2400-01), as well as beaver (see Map 08 of the Mammals
106 Technical Report) and moose (Map 10)?

107 Did the ecological criteria used by KHLP to delineate the VEC regional study area
108 boundary take into consideration that animal VECs move freely between Hayes River
109 Upland ecoregion and the adjacent Hudson Bay Lowland ecoregion?

110 Did the ecological criteria used by KHLP take into account that the ecosystem diversity,
111 intactness, wetland function and priority plants VECs in Hayes River Upland ecoregion
112 are not distinctly different from those in adjacent Hudson Bay Lowland ecoregion (i.e.,
113 beyond Study Zone 5), particularly in the transition zone between the two ecoregions?

114 Why did KHLP not consider the “physical locations of all past, current and reasonably
115 foreseeable future actions”, particularly when these actions traverse the Study Zone 5
116 boundary, e.g., transmission lines between Long Spruce GS and Henday CS, eastern and
117 northeastern extensions of the CN and the abandoned rail lines, northeastern extension
118 of Highway 290 and eastern extension of the future Bipole III transmission line?

119 Has the eastern boundary of Study Zone 5 been set at the point at which cumulative
120 effects become insignificant, as recommended by Hegmann et al. (1999)?

121 Do the extensions of these actions that occur within Study Zone 5 no longer have
 122 cumulative effects outside of Study Zone 5? Do all of the other projects within 60 km of
 123 the proposed Keeyask Generation Project not have a cumulative effect?

124 **RESPONSE:**

125 The response is provided separately below for different parts of the above question.

126 *In establishing spatial boundaries for cumulative effects, does Hegmann et al. (1999) not*
 127 *provide the following rules-of-thumb (see p. 14 of their document):*

- 128 . *“For terrestrial VECs such as vegetation and wildlife, ensure boundaries are*
 129 *ecologically defensible wherever possible.”*
- 130 . *“Set boundaries at the point at which cumulative effects become insignificant.”*
- 131 . *“Be prepared to adjust the boundaries during the assessment process if new*
 132 *information suggests this is warranted, and defend any such changes.”?*

133 Hegmann et al. (1999) provides the three rules of thumb listed above along with seven
 134 other rules of thumb, which are preceded by the statement that: “Any of the following
 135 rules-of-thumb may be used to assist in setting spatial boundaries”. As noted in the
 136 response to CEC Rd 1 CEC-0022, the study area approach was based on
 137 recommendations from a number of sources because neither the EIS Guidelines nor
 138 CEAA prescribe a particular methodology.

139 *Did the ecological criteria used by KHLP ignore the significant amounts of modeled*
 140 *habitat present in the Bipole III Transmission Project study area east of Study Zone 5 for*
 141 *the following VECs: mallard (see Map 1200-01 of the Birds Technical Report), bald eagle*
 142 *(Map 1500-01), olive-sided flycatcher (Map 2700-01), rusty blackbird (Map 3200-01),*
 143 *common nighthawk (Map 2400-01), as well as beaver (see Map 08 of the Mammals*
 144 *Technical Report) and moose (Map 10)?*

145 Bipole III modeled habitat for the identified species from Winnipeg to Conawapa. The
 146 ecological criteria used for the Keeyask assessment considered habitat in the Regional
 147 Study Areas relevant for the Keeyask VECs using habitat mapping created for the
 148 Keeyask Project.

149 *Did the ecological criteria used by KHLP to delineate the VEC regional study area*
 150 *boundary take into consideration that animal VECs move freely between Hayes River*
 151 *Upland ecoregion and the adjacent Hudson Bay Lowland ecoregion?*

152 Please see response to CEC Rd 2 CEC-0103a.

153 *Did the ecological criteria used by KHLP take into account that the ecosystem diversity,*
 154 *intactness, wetland function and priority plants VECs in Hayes River Upland ecoregion*

155 *are not distinctly different from those in adjacent Hudson Bay Lowland ecoregion (i.e.,*
156 *beyond Study Zone 5), particularly in the transition zone between the two ecoregions?*

157 The Ecoregion east of Study Zone 5 is distinctly different from Study Zone 5. Please see
158 response to CEC Rd 2 CEC-0103a.

159 *Why did KHLP not consider the “physical locations of all past, current and reasonably*
160 *foreseeable future actions”, particularly when these actions traverse the Study Zone 5*
161 *boundary, e.g., transmission lines between Long Spruce GS and Henday CS, eastern and*
162 *northeastern extensions of the CN and the abandoned rail lines, northeastern extension*
163 *of Highway 290 and eastern extension of the future Bipole III transmission line?*

164 The physical locations and other effects from the abovementioned projects were
165 considered to the extent they had overlap with cumulative effects on the Keeyask VECs.
166 Please see the responses to CEC Rd 2 CEC-0103a and CEC Rd 1 CEC-0022.

167 *Has the eastern boundary of Study Zone 5 been set at the point at which cumulative*
168 *effects become insignificant, as recommended by Hegmann et al. (1999)?*

169 Please see the responses to CEC Rd 2 CEC-0103a and CEC Rd 1 CEC-0022 for the
170 rationale used to delineate the eastern boundary of Study Zone 5.

171 *Do the extensions of these actions that occur within Study Zone 5 no longer have*
172 *cumulative effects outside of Study Zone 5?*

173 Please see the responses to CEC Rd 2 CEC-0103a and CEC Rd 1 CEC-0022 for the
174 response to this question.

175 *Do all of the other projects within 60 km of the proposed Keeyask Generation Project not*
176 *have a cumulative effect?*

177 Please see the responses to CEC Rd 2 CEC-0103a and CEC Rd 1 CEC-0022 for the
178 response to this question.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
 2 **Volume; Section: 7.5.2 Terrestrial Environment; Page No.: N/A**

3 **CEC Rd 2 CEC-0103d**

4 **ORIGINAL PREAMBLE AND QUESTION (CEC-0022):**

5 Section 1.3.5 of the Keyask EIS Terrestrial Environment Supporting Volume presents
 6 the Local and Regional Study Areas, each generally consisting of three Study Zones (see
 7 Map 2-1 of the Keyask EIS Terrestrial Environment Supporting Volume).

8 It was stated that:

9 *“Due to the manner in which it was derived, the Regional Study Area was generally used*
 10 *as the cumulative effects assessment area.”*

11 The Local and Regional Study Areas for many of the VECs and supporting topics were
 12 Study Zones 3 and 5, respectively (see Map 1-1, Terrestrial Environment). The east-west
 13 axis of the Study Zone 5 Regional Study Area extends from Long Spruce GS to just west
 14 of Thompson. The length of the eastern axis from the proposed Keyask GS to Long
 15 Spruce GS is approximately 50 km, whereas the length of the western axis from the
 16 proposed Keyask GS to west of Thompson is approximately 190 km, i.e., 3.6 times
 17 longer.

18 For most EAs, the Project Footprint is the centroid for the delineation of its study areas.

19 With the truncation of the Study Zone 5 Regional Study Area at Long Spruce GS, an
 20 assessment of the terrestrial environment components further east that have been
 21 affected by existing developments or would be affected by future developments was
 22 not undertaken.

23 Existing developments outside of Study Zone 5 include (for reference see Map 2 from
 24 the BiPole Transmission Project, called “Location of Existing and Proposed BiPole III
 25 Developments Outside Proposed Keyask Project Terrestrial Study Areas”):

- 26 · Community of Bird;
- 27 · Limestone GS;
- 28 · transmission lines between Limestone GS and Henday CS;
- 29 · transmission lines between Long Spruce GS Henday CS;
- 30 · Henday CS and the northern end of Bipole II;
- 31 · further northern extension of the KN36 transmission line;
- 32 · further northeastern extensions of the CN rail line and the abandoned rail line;
- 33 · further northeastern extension of Highway 290;

- 34 · Conawapa Road;
- 35 · access roads and trails;
- 36 · cutlines; and
- 37 · cleared, borrow and other disturbed areas.

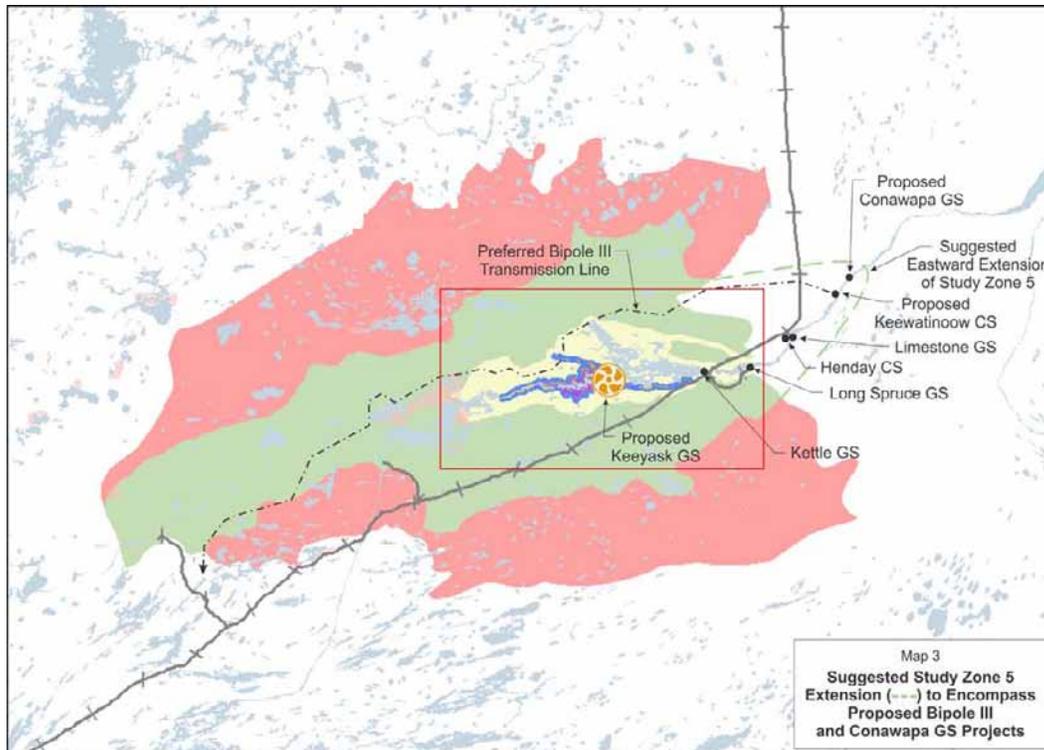
38 Proposed developments outside of Study Zone 5 include:

- 39 · many of the Bipole III Transmission Project components including:
 - 40 ○ the Keewatinoow Ground Electrode Site; o the Ground Electrode Line; o the
 - 41 Keewatinoow CS;
 - 42 ○ most of the AC collector line from Long Spruce GS to Henday CS;
 - 43 ○ the five AC collector lines from Henday CS to the Keewatinoow CS;
 - 44 ○ the construction power line from Henday CS to the construction camp site; o
 - 45 the start-up and main construction camp sites;
 - 46 ○ the work area site;
 - 47 ○ the borrow and excavated material placement areas;
 - 48 ○ an approximate 60-km section of the Bipole III HVdc Transmission Line from the
 - 49 Keewatinoow CS to the eastern limit of Study Zone 5; and
- 50 · the Conawapa GS, with a smaller inundation area but likely larger construction and
- 51 infrastructure footprint than the proposed Keeyask GS. It should be noted that there
- 52 is a westward indentation of Study Zone 5 resulting in additional exclusion of the
- 53 proposed Bipole III transmission line (see Map below).

54 An extension of the Study Zone 5 Regional Study Area approximately 60 km further
 55 northeast would have encompassed these existing and proposed developments (see
 56 Map below).

57 There is an inset figure at the top left hand side of Map 1-1 of the Keeyask Terrestrial
 58 Environment volume which delineates the Keeyask Generation Project Area, which
 59 extends the eastern boundary further east to encompass the existing and proposed
 60 developments. A suggested extension of Study Zone 5 to encompass all existing and
 61 proposed developments is presented below.

62 The Study Zone 5 Regional Study Area should be extended approximately 60 km further
 63 northeast to encompass the existing and proposed developments listed above. A
 64 suggested extension of Study Zone 5 to encompass all existing and proposed
 65 developments is presented below.



66

67 **FOLLOW-UP QUESTION:**

68 During a teleconference call on May 9, 2013 between CEC and KHLP consultants, it was
 69 strongly urged that KHLP extend Study Zone 5 Regional Study Area to encompass all
 70 existing and proposed developments to the northeast for the terrestrial environment
 71 cumulative effects assessment. KHLP indicated that the Study Zone 5 boundary reflected
 72 the boundary between two distinct ecoregions: Hayes River Upland to the west and
 73 Hudson Bay Lowland to the east. KHLP opined that this ecologically-based boundary
 74 encompassed the potential effects of the proposed Keeyask Generation Project as it
 75 extended from Thompson where most of the Project-related traffic will originate to
 76 Radisson Converter Station, the terminus of the proposed Keeyask Transmission Project.
 77 As such, Study Zone 5 provided the basis for the assessment of cumulative effects on
 78 terrestrial VECs.

79 The CEC consultant opined that the ecoregion boundary does not define genetically
 80 distinct populations of animal VECs, nor preclude their movement from one ecoregion
 81 to the other. Therefore, as there will be adverse impacts on populations of specific VECs,
 82 e.g., habitat loss, due to the Keeyask Generation Project in the Hayes River Upland
 83 ecoregion, there will be additional adverse impacts to these populations in the adjacent
 84 Hudson Bay Lowland ecoregion due to the past, existing and future projects within the
 85 ecoregion. The combination of adverse impacts in both ecoregions would have a
 86 cumulative effect on these populations.

87 KHLP responses to CEC-IR-022 are summarized below, each followed by an additional
 88 information requests.

89 KHLP RESPONSE 4:

- 90 · “The cumulative effects assessments considered from actions physically located
 91 outside of Study Zone 5, where effects from these actions have the potential to
 92 overlap spatially and temporally with those of the Project;”

93 ADDITIONAL CEC QUESTIONS TO RESPONSE 4:

- 94 · Please confirm that this statement only applies to caribou and that Study Zone 6 did
 95 not extend into the Hudson Bay Lowland ecoregion.
- 96 · Please provide the rationale for not extending the caribou Study Zone 6 into the
 97 Hudson Bay Lowland ecoregion (it is noted that the Pen Islands caribou assessment
 98 extended beyond Study Zone 6, as indicated in the following KHLP response). Do
 99 caribou not freely move between the Hayes River Upland, Selwyn Lake Upland and
 100 Hudson Bay Lowland ecoregions?
- 101 · Please confirm that this statement does not apply to the following terrestrial VECs:
 102 ecosystem diversity, intactness, wetland function, priority plants, Canada goose,
 103 mallard, bald eagle, olive-sided flycatcher, common nighthawk, rusty blackbird,
 104 moose and beaver.

105 **RESPONSE:**

106 The response is provided separately below for different parts of the above question.

107 *Please confirm that this statement only applies to caribou and that Study Zone 6 did not*
 108 *extend into the Hudson Bay Lowland ecoregion.*

109 The statement needs to be corrected as follows:

- 110 · “The cumulative effects assessments considered **effects** from actions physically
 111 located outside of Study Zone 5, where effects from these actions have the potential
 112 to overlap spatially and temporally with those of the Project;”

113 With the exception of bald eagle, which was screened out of the cumulative effects
 114 assessment for potential future projects (but not for cumulative effects with past and
 115 current projects; Response to EIS Guidelines Section 7.4, Table 7-3), the statement
 116 applies to all terrestrial valued environmental component (VEC)s including ecosystem
 117 diversity, intactness, wetland function, priority plants, Canada goose, mallard, olive-
 118 sided flycatcher, common nighthawk, rusty blackbird, caribou, moose and beaver.

119 Study Zone 6 does not extend into the Hudson Bay Lowland ecoregion.

120 *Please provide the rationale for not extending the caribou Study Zone 6 into the Hudson*
 121 *Bay Lowland ecoregion (it is noted that the Pen Islands caribou assessment extended*
 122 *beyond Study Zone 6, as indicated in the following KHLP response).*

123 As elaborated in CEC Rd 2 CEC-0103a, and as indicated in CEC Rd 1 CEC-0022, the Project
 124 terrestrial effects assessment takes a regional, ecosystem-based approach to identifying
 125 the environmental assessment study areas. Study Zone 6 was chosen as the regional
 126 study area for all caribou to account for the large ranges of migratory herds, but was not
 127 intended to represent their entire ranges, some of which extend into Nunavut or
 128 Ontario. If the Hudson Bay Lowland ecoregion was included in Study Zone 6, Project
 129 effects such as habitat loss would be masked (by making the effects of the Project as a
 130 percent of the area appear small).

131 To address the relevant caribou populations that may be affected by the Project, the
 132 cumulative effects assessment for caribou considered effects that extended beyond
 133 Study Zone 6 using the approach described in the response to CEC Rd 2 CEC-0103a.
 134 Please see CEC Rd 1 CEC-0037b for information relating to cumulative effects on caribou
 135 and CEC Rd 2 MMF-0103e for other study area considerations for cumulative effects.

136 *Do caribou not freely move between the Hayes River Upland, Selwyn Lake Upland and*
 137 *Hudson Bay Lowland ecoregions?*

138 Caribou move freely between many ecoregions, including those into Ontario and
 139 Nunavut. Please refer to CEC Rd 2 CEC-0103a for further context concerning study area
 140 selection.

141 *Please confirm that this statement does not apply to the following terrestrial VECs:*
 142 *ecosystem diversity, intactness, wetland function, priority plants, Canada goose,*
 143 *mallard, bald eagle, olive-sided flycatcher, common nighthawk, rusty blackbird, moose*
 144 *and beaver.*

145 With the exception of bald eagle, which was screened out of the cumulative effects
 146 assessment for potential future projects (but not for cumulative effects with past and
 147 current projects; Response to EIS Guidelines Section 7.4, Table 7-3), the statement
 148 applies to all terrestrial valued environmental component (VEC)s including ecosystem
 149 diversity, intactness, wetland function, priority plants, Canada goose, mallard, olive-
 150 sided flycatcher, common nighthawk, rusty blackbird, caribou, moose and beaver.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
 2 **Volume; Section: 7.5.2 Terrestrial Environment; Page No.: N/A**

3 **CEC Rd 2 CEC-0103e**

4 **ORIGINAL PREAMBLE AND QUESTION (CEC-0022):**

5 Section 1.3.5 of the Keeyask EIS Terrestrial Environment Supporting Volume presents
 6 the Local and Regional Study Areas, each generally consisting of three Study Zones (see
 7 Map 2-1 of the Keeyask EIS Terrestrial Environment Supporting Volume).

8 It was stated that:

9 *“Due to the manner in which it was derived, the Regional Study Area was generally used*
 10 *as the cumulative effects assessment area.”*

11 The Local and Regional Study Areas for many of the VECs and supporting topics were
 12 Study Zones 3 and 5, respectively (see Map 1-1, Terrestrial Environment). The east-west
 13 axis of the Study Zone 5 Regional Study Area extends from Long Spruce GS to just west
 14 of Thompson. The length of the eastern axis from the proposed Keeyask GS to Long
 15 Spruce GS is approximately 50 km, whereas the length of the western axis from the
 16 proposed Keeyask GS to west of Thompson is approximately 190 km, i.e., 3.6 times
 17 longer.

18 For most EAs, the Project Footprint is the centroid for the delineation of its study areas.

19 With the truncation of the Study Zone 5 Regional Study Area at Long Spruce GS, an
 20 assessment of the terrestrial environment components further east that have been
 21 affected by existing developments or would be affected by future developments was
 22 not undertaken.

23 Existing developments outside of Study Zone 5 include (for reference see Map 2 from
 24 the BiPole Transmission Project, called “Location of Existing and Proposed BiPole III
 25 Developments Outside Proposed Keeyask Project Terrestrial Study Areas”):

- 26 · Community of Bird;
- 27 · Limestone GS;
- 28 · transmission lines between Limestone GS and Henday CS;
- 29 · transmission lines between Long Spruce GS Henday CS;
- 30 · Henday CS and the northern end of Bipole II;
- 31 · further northern extension of the KN36 transmission line;
- 32 · further northeastern extensions of the CN rail line and the abandoned rail line;
- 33 · further northeastern extension of Highway 290;

- 34 · Conawapa Road;
- 35 · access roads and trails;
- 36 · cutlines; and
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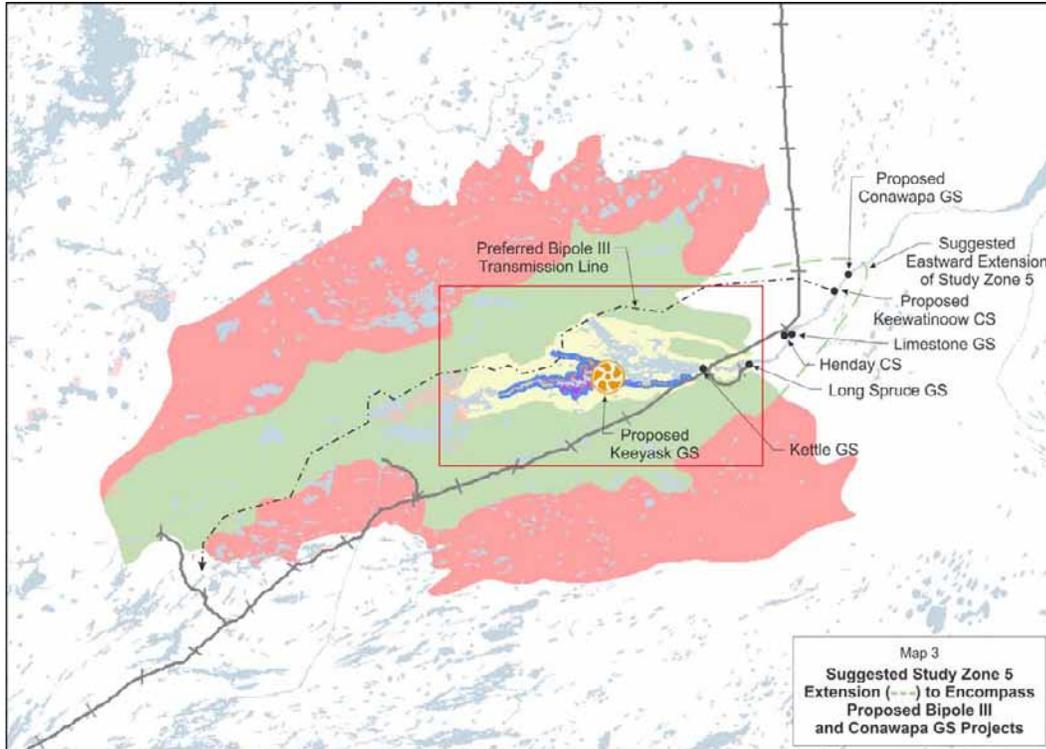
38 Proposed developments outside of Study Zone 5 include:

- 39 · many of the Bipole III Transmission Project components including:
 - 40 ○ the Keewatinoow Ground Electrode Site; o the Ground Electrode Line; o the
 - 41 Keewatinoow CS;
 - 42 ○ most of the AC collector line from Long Spruce GS to Henday CS;
 - 43 ○ the five AC collector lines from Henday CS to the Keewatinoow CS;
 - 44 ○ the construction power line from Henday CS to the construction camp site; o
 - 45 the start-up and main construction camp sites;
 - 46 ○ the work area site;
 - 47 ○ the borrow and excavated material placement areas;
 - 48 ○ an approximate 60-km section of the Bipole III HVdc Transmission Line from the
 - 49 Keewatinoow CS to the eastern limit of Study Zone 5; and
- 50 · the Conawapa GS, with a smaller inundation area but likely larger construction and
- 51 infrastructure footprint than the proposed Keeyask GS. It should be noted that there
- 52 is a westward indentation of Study Zone 5 resulting in additional exclusion of the
- 53 proposed Bipole III transmission line (see Map below).

54 An extension of the Study Zone 5 Regional Study Area approximately 60 km further
 55 northeast would have encompassed these existing and proposed developments (see
 56 Map below).

57 There is an inset figure at the top left hand side of Map 1-1 of the Keeyask Terrestrial
 58 Environment volume which delineates the Keeyask Generation Project Area, which
 59 extends the eastern boundary further east to encompass the existing and proposed
 60 developments. A suggested extension of Study Zone 5 to encompass all existing and
 61 proposed developments is presented below.

62 The Study Zone 5 Regional Study Area should be extended approximately 60 km further
 63 northeast to encompass the existing and proposed developments listed above. A
 64 suggested extension of Study Zone 5 to encompass all existing and proposed
 65 developments is presented below.



66

67 **FOLLOW-UP QUESTION:**

68 During a teleconference call on May 9, 2013 between CEC and KHLP consultants, it was
 69 strongly urged that KHLP extend Study Zone 5 Regional Study Area to encompass all
 70 existing and proposed developments to the northeast for the terrestrial environment
 71 cumulative effects assessment. KHLP indicated that the Study Zone 5 boundary reflected
 72 the boundary between two distinct ecoregions: Hayes River Upland to the west and
 73 Hudson Bay Lowland to the east. KHLP opined that this ecologically-based boundary
 74 encompassed the potential effects of the proposed Keeyask Generation Project as it
 75 extended from Thompson where most of the Project-related traffic will originate to
 76 Radisson Converter Station, the terminus of the proposed Keeyask Transmission Project.
 77 As such, Study Zone 5 provided the basis for the assessment of cumulative effects on
 78 terrestrial VECs.

79 The CEC consultant opined that the ecoregion boundary does not define genetically
 80 distinct populations of animal VECs, nor preclude their movement from one ecoregion
 81 to the other. Therefore, as there will be adverse impacts on populations of specific VECs,
 82 e.g., habitat loss, due to the Keeyask Generation Project in the Hayes River Upland
 83 ecoregion, there will be additional adverse impacts to these populations in the adjacent
 84 Hudson Bay Lowland ecoregion due to the past, existing and future projects within the
 85 ecoregion. The combination of adverse impacts in both ecoregions would have a
 86 cumulative effect on these populations.

87 KHLP responses to CEC-IR-022 are summarized below, each followed by an additional
88 information requests.

89 KHLP RESPONSE 5:

90 “Where necessary to address the relevant population home range that may be affected
91 by the Project, the cumulative effects assessment for certain VECs used additional study
92 areas that extended outside Study Zone 5 and Study Zone 6. For example, the
93 cumulative effects assessment study area for the Pen Islands caribou assessment
94 extends through northeastern Manitoba and northwestern Ontario because this
95 encompasses the range for this caribou population. Since this study area overlaps
96 spatially with some effects from Conawapa, Bipole III (including Keewatinoow) and
97 Gillam redevelopment (all east of Study Zone 5), the Pen Islands caribou assessment
98 also considers effects from these developments even though they are outside of Study
99 Zone 5.”

100 ADDITIONAL CEC QUESTIONS TO RESPONSE 5:

101 Please confirm that this statement only applies to the Pen Islands caribou assessment.

102 Please confirm that this statement does not apply to any other terrestrial VECs,
103 including other caribou populations.

104 Please confirm that Gillam redevelopment is located within (not east of) Study Zone 5.

105 **RESPONSE:**

106 The response is provided separately below for different parts of the above question.

107 *Please confirm that this statement only applies to the Pen Islands caribou assessment.*

108 *Please confirm that this statement does not apply to any other terrestrial VECs, including*
109 *other caribou populations.*

110 To clarify, all of the terrestrial habitat, ecosystem and wildlife study areas, (including the
111 bird and mammal study areas), overlap with some effects from Conawapa, Bipole III
112 (including including Keewatinoow) and Gillam redevelopment. Please refer to CEC Rd 2
113 CEC-0103a.

114 The broader use of study areas outside of Zones 5 and 6 applied to Canada goose,
115 moose and Pen Islands caribou.

116 *Please confirm that Gillam redevelopment is located within (not east of) Study Zone 5.*

117 Gillam redevelopment is located within Study Zone 5. The amended sentence should
118 read “Since this study area overlaps spatially with some effects from Conawapa and

119 Bipole III (including Keewatinoow), which are east of Study Zone 5, the Pen Islands
120 caribou assessment also considers effects from these developments even though they
121 are outside of Study Zone 5.”

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 7.5.2**
 2 **Terrestrial Environment; Page No.: N/A**

3 **CEC Rd 2 CEC-0103f**

4 **ORIGINAL PREAMBLE AND QUESTION (CEC-0022):**

5 Section 1.3.5 of the Keeyask EIS Terrestrial Environment Supporting Volume presents
 6 the Local and Regional Study Areas, each generally consisting of three Study Zones (see
 7 Map 2-1 of the Keeyask EIS Terrestrial Environment Supporting Volume).

8 It was stated that:

9 *“Due to the manner in which it was derived, the Regional Study Area was generally used*
 10 *as the cumulative effects assessment area.”*

11 The Local and Regional Study Areas for many of the VECs and supporting topics were
 12 Study Zones 3 and 5, respectively (see Map 1-1, Terrestrial Environment). The east-west
 13 axis of the Study Zone 5 Regional Study Area extends from Long Spruce GS to just west
 14 of Thompson. The length of the eastern axis from the proposed Keeyask GS to Long
 15 Spruce GS is approximately 50 km, whereas the length of the western axis from the
 16 proposed Keeyask GS to west of Thompson is approximately 190 km, i.e., 3.6 times
 17 longer.

18 For most EAs, the Project Footprint is the centroid for the delineation of its study areas.

19 With the truncation of the Study Zone 5 Regional Study Area at Long Spruce GS, an
 20 assessment of the terrestrial environment components further east that have been
 21 affected by existing developments or would be affected by future developments was
 22 not undertaken.

23 Existing developments outside of Study Zone 5 include (for reference see Map 2 from
 24 the BiPole Transmission Project, called “Location of Existing and Proposed BiPole III
 25 Developments Outside Proposed Keeyask Project Terrestrial Study Areas”):

- 26 · Community of Bird;
- 27 · Limestone GS;
- 28 · transmission lines between Limestone GS and Henday CS;
- 29 · transmission lines between Long Spruce GS Henday CS;
- 30 · Henday CS and the northern end of Bipole II;
- 31 · further northern extension of the KN36 transmission line;
- 32 · further northeastern extensions of the CN rail line and the abandoned rail line;
- 33 · further northeastern extension of Highway 290;

- 34 . Conawapa Road;
- 35 . access roads and trails;
- 36 . cutlines; and
- 37 . cleared, borrow and other disturbed areas.

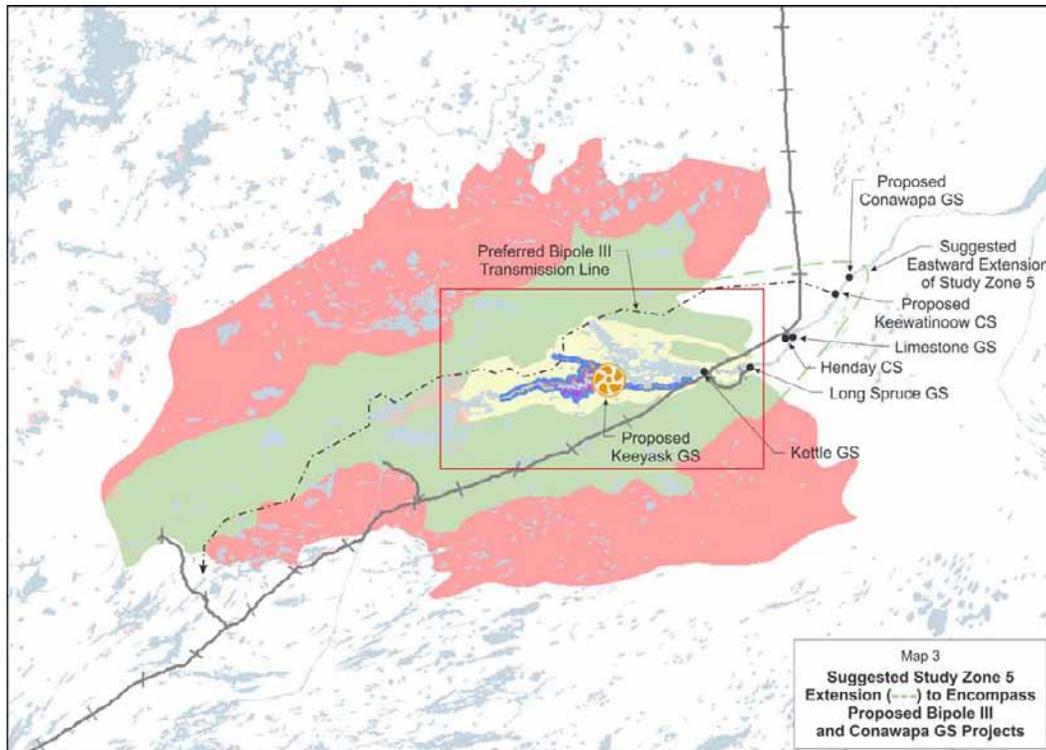
38 Proposed developments outside of Study Zone 5 include:

- 39 . many of the Bipole III Transmission Project components including:
 - 40 o the Keewatinoow Ground Electrode Site; o the Ground Electrode Line; o the
 - 41 Keewatinoow CS;
 - 42 o most of the AC collector line from Long Spruce GS to Henday CS;
 - 43 o the five AC collector lines from Henday CS to the Keewatinoow CS;
 - 44 o the construction power line from Henday CS to the construction camp site; o
 - 45 the start-up and main construction camp sites;
 - 46 o the work area site;
 - 47 o the borrow and excavated material placement areas;
 - 48 o an approximate 60-km section of the Bipole III HVdc Transmission Line from the
 - 49 Keewatinoow CS to the eastern limit of Study Zone 5; and
- 50 . the Conawapa GS, with a smaller inundation area but likely larger construction and
- 51 infrastructure footprint than the proposed Keeyask GS. It should be noted that there
- 52 is a westward indentation of Study Zone 5 resulting in additional exclusion of the
- 53 proposed Bipole III transmission line (see Map below).

54 An extension of the Study Zone 5 Regional Study Area approximately 60 km further
 55 northeast would have encompassed these existing and proposed developments (see
 56 Map below).

57 There is an inset figure at the top left hand side of Map 1-1 of the Keeyask Terrestrial
 58 Environment volume which delineates the Keeyask Generation Project Area, which
 59 extends the eastern boundary further east to encompass the existing and proposed
 60 developments. A suggested extension of Study Zone 5 to encompass all existing and
 61 proposed developments is presented below.

62 The Study Zone 5 Regional Study Area should be extended approximately 60 km further
 63 northeast to encompass the existing and proposed developments listed above. A
 64 suggested extension of Study Zone 5 to encompass all existing and proposed
 65 developments is presented below.



66

67 **FOLLOW-UP QUESTION:**

68 During a teleconference call on May 9, 2013 between CEC and KHLP consultants, it was
 69 strongly urged that KHLP extend Study Zone 5 Regional Study Area to encompass all
 70 existing and proposed developments to the northeast for the terrestrial environment
 71 cumulative effects assessment. KHLP indicated that the Study Zone 5 boundary reflected
 72 the boundary between two distinct ecoregions: Hayes River Upland to the west and
 73 Hudson Bay Lowland to the east. KHLP opined that this ecologically-based boundary
 74 encompassed the potential effects of the proposed Keeyask Generation Project as it
 75 extended from Thompson where most of the Project-related traffic will originate to
 76 Radisson Converter Station, the terminus of the proposed Keeyask Transmission Project.
 77 As such, Study Zone 5 provided the basis for the assessment of cumulative effects on
 78 terrestrial VECs.

79 The CEC consultant opined that the ecoregion boundary does not define genetically
 80 distinct populations of animal VECs, nor preclude their movement from one ecoregion
 81 to the other. Therefore, as there will be adverse impacts on populations of specific VECs,
 82 e.g., habitat loss, due to the Keeyask Generation Project in the Hayes River Upland
 83 ecoregion, there will be additional adverse impacts to these populations in the adjacent
 84 Hudson Bay Lowland ecoregion due to the past, existing and future projects within the
 85 ecoregion. The combination of adverse impacts in both ecoregions would have a
 86 cumulative effect on these populations.

87 KHL P responses to CEC-IR-022 are summarized below, each followed by an additional
88 information requests.

89 KHL P RESPONSE 6: "In all approaches, Project impact areas may include non-physical
90 impacts, such as noise or traffic, where relevant for the topic."

91 ADDITIONAL CEC QUESTION TO RESPONSE 6:

92 As construction activities associated with the Keeyask Generation Project will likely
93 overlap with those associated with Bipole III and/or Conawapa, would traffic and
94 associated noise not have cumulative impacts on animal VECs within and beyond Study
95 Zone 5?

96 **RESPONSE:**

97 Disturbances associated with construction activities were considered in the effects
98 assessment for all animal VECs. Please refer to CEC Rd 2 CEC-0103a for a discussion of
99 cumulative effects that consider spatial and temporal overlap for VECs, and how study
100 areas were used in the assessment.

1 **REFERENCE: Volume: KCN Evaluation Reports; Section: N/A; Page**
 2 **No.: N/A**

3 **CEC Rd 2 CEC-0104**

4 **ORIGINAL PREAMBLE AND QUESTION (CEC-0035):**

5 **FIRST NATIONS CUMULATIVE EFFECTS ASSESSMENTS OF THE PROPOSED**
 6 **KEYYASK GENERATION PROJECT**

7 Manitoba Hydro, in collaboration with four Manitoba First Nations, i.e., Tataskweyak
 8 Cree Nation (TCN), York Factory First Nation (YFFN), Fox Lake Cree Nation (FLCN) and
 9 War Lake First Nation (WLFN), have formed the Keeyask Hydropower Limited
 10 Partnership (KHLP) to develop the proposed Keeyask Generation Project and the
 11 Keeyask Infrastructure Project

12 In a letter dated June 6, 2012 from V. Spence, Manager of Future Development, TCN, to
 13 T. Sargeant, Chair, Manitoba Clean Environment Commission with regard to the
 14 proposed Bipole III Transmission Project, it was stated that substantial hydroelectric
 15 development has occurred within the Split Lake Resource Management Area (SLRMA).
 16 “Existing hydroelectric development includes 35 major projects which cover a footprint
 17 of 124,000 acres of land – an area comparable to the City of Winnipeg. It is TCN’s
 18 position that Manitoba Hydro has not fully considered the cumulative effects of this
 19 development in the environmental impact statement. By limiting the spatial and
 20 temporal scale of their assessment, the Bipole III EIS fails to consider the impacts of
 21 past, existing, and future projects in their cumulative effects assessment, particularly
 22 those within the SLRMA and our Resource Area. Failure to consider these existing
 23 projects is failure to consider or fully understand the impacts on TCN and its Members.
 24 Furthermore, without a thorough understanding of the cumulative effects, it is difficult
 25 to identify and develop appropriate biophysical and socioeconomic mitigation
 26 strategies.”

27 In an Environmental Review of the proposed Keeyask Generation Project, SLCFN (1996)
 28 provided some details on the effects of hydroelectric development in the SLRMA, as
 29 indicated below:

- 30 • Kelsey Generating Station (GS), which came into operation in 1960, “flooded land
 31 for a distance of 150 kilometres upstream of Split Lake along the Nelson River,
 32 affecting 14,250 acres of northern boreal forest”;

- 33 • The “massive hydroelectric developments” in the 1970s altered “the landscape in
34 ways which were far more dramatic and profound than the effects of the Kelsey
35 generating station”;
- 36 • The Kettle GS, which began operation in 1970, resulted in the flooding of “over
37 54,000 acres of land including many First Nation traditional harvesting, recreational
38 and cultural sites”;
- 39 • Long Spruce GS, which began operation in 1977, resulted in water level increases of
40 85 feet and the flooding of “over 3,400 acres of Nelson River shoreline and
41 tributaries”;
- 42 • “Only three years after Lake Winnipeg Regulation – Churchill River Diversion, spring
43 and summer flooding in 1979 produced some of the highest water levels on record,
44 with particularly severe impacts on shorelines, wildlife habitat, and domestic
45 harvesting”;
- 46 • “The Churchill River Diversion increased flows down the Burntwood River more than
47 eight-fold, permanently flooding shorelines and adding additional flow down the
48 Nelson River. Over 1500 acres of Split Lake reserve land were taken for Hydro water
49 storage purposes. The opposite effect occurred on the Churchill River, in the north
50 of the resource area, where over 17,000 acres of formerly rugged wilderness
51 shoreline were dewatered and Billard and Fidler Lakes were substantially reduced in
52 size”; and
- 53 • “The spring and early summer flood of 1986, not totally unusual in a state of nature,
54 also caused consternation, as had the earlier flood of 1979, since such floods were
55 contrary to the intended effects of the Hydro regulation scheme. Both domestic and
56 commercial harvesting practices were seriously disrupted as unnatural ice effects
57 and flooding up to five to six feet beyond the norm took their toll. Extreme events
58 such as these also caused many ‘hidden’ effects on plants, insects and wildlife
59 struggling to adapt to the regulated water regime. These are difficult to describe
60 and impossible to quantify”.

61 In addition to the preparation of Environmental Impact Statement (EIS) for the proposed
62 Keeyask Generation Project pursuant to the federal Canadian Environmental
63 Assessment Act (CEAA) and the provincial The Environment Act, the four First Nations,
64 collectively termed the Keeyask Cree Nations (KCNs), prepared separate Keeyask
65 Environmental Evaluation Reports (CNP, 2012; FLCN, 2012; TCN, 2012).

66 Although aware of the requirements of the CEAA and The Environment Act (Manitoba)
67 in assessing the environmental effects of a major resource development project, the
68 Keeyask Environmental Evaluation Reports were not prepared in compliance with these
69 requirements (they did not need to be). Rather, the KCNs have selected their own

70 approaches to the assessment of environmental effects on their communities that are
71 based in their cultural identities and worldviews.

72 The following was stated in the Executive Summary for the proposed Keeyask
73 Generation Project EIS:

74 "The cumulative effects assessment focuses on valued environmental
75 components that will be adversely affected by the Project, based on the effects
76 assessment summarized in Section 5 of this Executive Summary.

77 The Partnership recognizes that the valued environmental component approach
78 as required by the regulatory process does not capture the broader concept of
79 the Cree worldview, which places equal importance on all components of the
80 environment, as all parts are important and interrelated. Further, a cumulative
81 effects perspective is inherent in the Cree worldview, which considers the
82 effects of the Project in the context of everything that is anticipated to happen
83 in the future."

84 SENES had previously undertaken a review of the cumulative effects assessment
85 undertaken for the terrestrial environment component of the proposed Keeyask
86 Generation Project as presented in the Terrestrial Supporting Document, the EIS and the
87 Executive Summary. This review identified a number of deficiencies particularly with
88 respect to study area coverage of past, existing and future projects, as well as the
89 selection of valued environmental components (VECs) and supporting topics and their
90 carry over to cumulative effects assessment based on determination of negative
91 residual effects.

92 SENES has subsequently reviewed the Keeyask Environmental Evaluation Reports to
93 determine how cumulative effects were assessed by the KCNs based on past, current
94 and future projects, with an emphasis on the terrestrial environment. SENES also
95 reviewed the TCN (2011) "Report on Keeyask Transmission Project" to determine
96 whether cumulative effects were addressed.

97 **FLCN (2012) Environment Evaluation Report**

98 One of the objectives stated in the FLCN (2012) Environment Evaluation Report was:

- 99 • "Describe the known cumulative impacts of successive hydroelectric projects on our
100 people and Aski."

101 As part of the environmental assessment (EA) of the proposed Keeyask Generation
102 Project undertaken by the KHLP pursuant to the federal CEEA and The Environment Act
103 (Manitoba), VECs were selected to focus the assessment of the significance of adverse

104 effects. Subsequently, the cumulative effects assessment utilized a subset of VECs for
105 which it was determined that there may be a negative residual effect.

106 FLCN (2012) stated that it was “difficult to accept” the VEC process. “The VEC approach
107 of identifying and studying key issues of importance operates on the basis of selecting a
108 number of species for study, often determined by their “at-risk” or “endangered”
109 status”... “By its very nature, the VEC approach tends to ignore the interrelatedness of
110 people, animals, water, landscape and plants, which are inherent in the way FLCN and
111 our people view and define Aski. Our people do not place greater importance on certain
112 species and all are valued equally. The entire Kischi Sipi including Inninuwak, fish, bird,
113 plants and wildlife all of who use, inhabit and benefit from the river would constitute a
114 VEC.”

115 It is further stated that “Our people define baseline as the condition of the land, waters
116 and people prior to hydroelectric development which began in the early 1960s. This is in
117 contrast to Manitoba Hydro’s baseline defined as the existing condition of the
118 terrestrial, aquatic, and socioeconomic environments. Accepting the baseline as the
119 conditions prior to any hydro development in FLCN’s view of how best to understand
120 and assess how our people and our land and waters will be further impacted by the
121 proposed Keeyask project.”

122 It is also stated that “Our people have been greatly impacted by fifty years of hydro
123 development and the Keeyask project will further disturb, fragment, and destroy lands
124 and waters that have been and continue to be used by our Members. FLCN views all
125 hydro projects, including Keeyask, as one continuous staged process of development
126 with impacts that are cumulative and long-term.”

127 In the section entitled “Brief History of Hydroelectric Development in Northern
128 Manitoba”, FLCN (2012) identifies the various hydroelectric and transmission
129 developments, and in some instances, their direct impact on the terrestrial
130 environment, e.g., the flooding of 54,000 acres of land by Kettle GS, over 3,400 acres by
131 Long Spruce GS and approximately 500 acres by Limestone GS. The Conawapa
132 Generation Project and Bipole III Transmission Project are also identified as future
133 projects.

134 Similarly, in the section entitled “Description of the Keeyask Generation Project”, FLCN
135 (2012) identifies the various proposed Project components, and in some instances, their
136 direct impact on the terrestrial environment, e.g., flooding of 45 km² of lands with
137 reservoir expansion by approximately 7 to 8 km² during the first 30 years of
138 hydroelectric generation, and use of borrow areas with a potential surface area of
139 approximately 1,300 ha.

140 In the “Summary of Cumulative Impacts on Fox Lake’s Aski”, of the 16 cumulative
 141 impacts listed (most of which are aquatic-related), the only impact on the terrestrial
 142 environment listed is:

- 143 • “The permanent loss or transformation of biologically unique areas.”

144 **CNP (2012) Keeyask Environmental Evaluation**

145 The CNP (2012) report presents a similar approach to the EA of the proposed Keeyask as
 146 FLCN (2012) as quoted below:

147 *“In evaluating any new development such as the Keeyask Project and in*
 148 *determining the resulting impacts, our holistic worldview requires that all of our*
 149 *relationships with Mother Earth be considered. Particular species of plants and*
 150 *animals or individual relationships cannot be singled out from the remainder*
 151 *when assessing the overall impact on harmony and balance in our homeland*
 152 *ecosystem, and subsequently on our culture.”*

153 The CNP (2012) report provides little information on cumulative effects. It is stated in
 154 Appendix 2 that the “current state of our homeland ecosystem is the result of many
 155 post-contact events acting cumulatively on the state of harmony and balance that
 156 existed at the time of our first contact with Europeans”. It is further stated that “of all
 157 the changes imposed from the outside, the dams, regulation and diversion brought
 158 about the largest changes to our physical environment and caused the most severe
 159 impacts on our culture by permanently altering the land and waterscapes found in our
 160 homeland ecosystem”.

161 **YFFN (2012) Our Voices**

162 YFFN (2012) is primarily a colloquial document presenting comments of First Nation
 163 members on their worldview, history, changes and damage to water, land and people
 164 due to previous hydro development and the proposed Keeyask Generation Project, the
 165 Keeyask partnership, hopes and expectations.

166 There are a few references to cumulative effects as listed below:

- 167 • “Our people have been cumulatively impacted. Over the last 60 years, we have been
 168 impacted by our dislocation from York Factory, residential schools, and hydro-
 169 development. These impacts have built upon each other and continue today.”
- 170 • “As hydro-electric development now proceeds towards Keeyask, Conawapa and the
 171 Bipole projects, we find ourselves living in an ever more compromised and uncertain
 172 natural environment – one changed forever and still adapting to the effects of past
 173 development.”

- 174 • “When our members talk about Keeyask, we don’t see this project as any different
 175 from the changes brought by the overall Churchill/Nelson/Burntwood hydro-electric
 176 program. We see Keeyask as a continuation of a larger development project. We are
 177 not confident that the exact effects of a new development can be predicted, but we
 178 expect Keeyask to add to the changes that we have already experienced – to further
 179 destabilize our increasingly compromised environment” .
- 180 • “We have experienced the cumulative changes caused by numerous past” (this
 181 sentence on pg. 89 does not carry over to pg. 90).

182 **TCN (2011) Report on Keeyask Transmission Project**

183 TCN (2011) states that “current estimates suggests that 567 hectares of land will be
 184 required for the construction of all transmission lines, the Keeyask switching station,
 185 future expansion of the switching station, and the construction power transformer
 186 station.”

187 The only reference to cumulative effects is as follows:

188 “To date, Manitoba Hydro has built 35 major projects including 13 high voltage
 189 power lines, 4 generating stations, roads, rail spurs, 2 airports, and other
 190 facilities. We have not only seen but also suffered the immeasurable effects that
 191 these projects have had on our traditional lifestyles, which permeates
 192 throughout our social, economic, spiritual, and cultural customs and practices.”

193 **Summary**

194 Overall, cumulative effects assessment of the proposed Keeyask Generation Project
 195 undertaken by the KCNs was qualitative. This is in contrast to the information provided
 196 on past hydroelectric projects by the TCN in their submission to the Manitoba CEC
 197 Public Hearing on the Bipole III Transmission Project, specifically in Attachment 1. This
 198 document provides a breakdown of the land areas that have been affected by 35
 199 Manitoba Hydro and related projects between 1955 and 1994 in the Split Lake Cree
 200 Study Area, which corresponds with the SLRMA (see Table 1).

201 Over this time span, 36,322 ha of land were flooded due to hydroelectric generation and
 202 other water-related projects and 13,817 ha of land were cleared/alterd by
 203 transmission line and other infrastructure projects. This has resulted in a total of 50,139
 204 ha of lands affected by Manitoba Hydro projects and other related activities.

Table 1: Lands Affected by Manitoba Hydro Projects and Related Activities in the Split Lake Cree Study Area by Project, 1955 to 1994

Project	Flooding/ Dewatering (ha)	Surface Land Use (ha)	Total (ha)
1955-59			
Kelsey Rail Spur		184	184
1960-69			
Kelsey GS	5,767	47	5,814
Kelsey GS Airstrip		121	121
Kelsey GS to Thompson 138 kV Transmission Line		559	559
Kelsey GS to Radisson Converter Station (CS) 138 kV Transmission Line		594	594
Tap to Gillam, Kettle GS 138 kV Transmission Line		61	61
Gillam Townsite Expansion		148	148
Split Lake Diesel GS		2	2
1970-79			
Kettle GS (incl. Butnau Diversion)	22,066	408	22,474
Long Spruce GS Rail Spur		103	103
Long Spruce GS to Gillam Road (1971)		157	157
Radisson CS		18	18
Kettle GS to Radisson CS 138 kV Transmission Lines (7 lines)		159	159
HVDC Bipole #1&2 +/-500 kV Transmission Line		4,079	4,079
Kelsey GS to Mystery Lake 230 kV Transmission Line		37	37
Iford to Split Lake Transmission Line		162	162
Kelsey GS to Radisson CS 230 kV Transmission Line		594	594
Sundance Townsite		83	83
Long Spruce GS to Sundance Road (1976)		157	157
Limestone GS Rail Spur		15	15

Table 1: Lands Affected by Manitoba Hydro Projects and Related Activities in the Split Lake Cree Study Area by Project, 1955 to 1994

Project	Flooding/ Dewatering (ha)	Surface Land Use (ha)	Total (ha)
Henday CS		16	16
Long Spruce GS to Henday CS 230 kV T.L. (3 lines)		206	206
Long Spruce GS to Radisson CS 230 kV T.L. (3 lines)		177	177
Lake Winnipeg Regulation (NFA Easement Land)		790	790
Churchill River Diversion (dewatering)	6,904		6,904
Long Spruce GS	1,376		1,728
Henday CS to Radisson CS HVDC Bipole #2 +/-500 kV		1,594	1,594
Thompson to Split Lake Road		608	608
1980-89			
Split Lake to Long Spruce GS Road		667	667
Radisson CS to Churchill 138 kV Transmission Line		712	712
Radisson CS to Limestone GS138 kV Transmission Line		366	366
Henday CS Collector Lines		60	60
1990-94			
Limestone GS	209	277	486
HVDC Bipole #2 HVDC backup +/-500 kV Transmission Line		69	69
Kelsey GS to Split Lake 138 kV Transmission Line		235	235
Total	36,322	13,817	50,139

205

206 Table 2 is an extension of Table 1 listing additional existing and future developments in
 207 the SLRMA and the Fox Lake Resource Management Area (FLRMA).

Table 2 Lands Affected or to be Affected by Manitoba Hydro Projects and Related Activities in the SLRMA and FLRMA.

Project/Development	Flooding/Dewatering (ha)	Surface Land Use (ha)	Total (ha)
Bipole III Transmission Project			
Keewatinoow Ground Electrode Site			
Ground Electrode Line			
Keewatinoow CS			
Long Spruce GS to Henday CS ac Collector Line			
Henday CS to Keewatinoow CS Collector			
Lines (5 lines)			
Henday CS to Construction Camp Site Power Line			
Start-up Construction Camp Site			
Main Construction Camp Site			
Work Area Site			
Borrow Areas			
Excavated Material Placement Areas			
HVDC Bipole #3 +/-500 kV Keewatinoow CS to western limit of SLRMA			
Keeyask Generation Project/Keeyask Infrastructure Project			
Expanded Reservoir		5200	
North and South Dyke			
Temporary Work Camp			
Construction Camp			
Borrow Areas			
North and South Access Roads			
Other Access Roads			
Excavated Material Placement Areas			
Transmission Tower Spur			
Keeyask Transmission Project			
Construction Power Line and Substation			
Keeyask GS to Radisson CS (3 lines)			
Switching Station			

Conawapa GS

Reservoir

Work/Construction Camp

Borrow Areas

Excavated Material Placement
Areas

Access Roads

Transmission/Construction
Power Lines

Other Infrastructure

Other Developments/Projects

Community of Bird

CN and Abandoned Rail lines

PR 280 Upgrade

Conawapa Road

Access Roads and Trails

Cleared, Borrow and Other
Disturbed Areas

Gillam Redevelopment

Other Developments/Projects

208 Table 2 should be completed by Manitoba Hydro and combined with Table 1 to
 209 determine the total land area affected or to be affected by Manitoba Hydro projects and
 210 related activities in the SLRMA and FLRMA. This would provide a quantitative basis for
 211 determining the cumulative effects of past, existing and future projects/activities on the
 212 KCNs and the resource areas.

213 **FOLLOW-UP QUESTION:**

214 There are no questions. The CEC thanks KHLP for providing the data and has the
 215 following comments on the data.

216 It was indicated in the preamble to CEC-IR-035 that: "Although aware of the
 217 requirements of the CEAA and The Environment Act (Manitoba) in assessing the
 218 environmental effects of a major resource development project, the Keeyask
 219 Environmental Evaluation Reports were not prepared in compliance with these
 220 requirements (they did not need to be). Rather, the KCNs have selected their own
 221 approaches to the assessment of environmental effects on their communities that are
 222 based in their cultural identities and worldviews.

223 The following was stated in the Executive Summary for the proposed Keeyask
 224 Generation Project EIS:

225 "The cumulative effects assessment focuses on valued environmental
 226 components that will be adversely affected by the Project, based on the effects
 227 assessment summarized in Section 5 of this Executive Summary. The
 228 Partnership recognizes that the valued environmental component approach as
 229 required by the regulatory process does not capture the broader concept of the
 230 Cree worldview, which places equal importance on all components of the
 231 environment, as all parts are important and interrelated. Further, a cumulative
 232 effects perspective is inherent in the Cree worldview, which considers the
 233 effects of the Project in the context of everything that is anticipated to happen
 234 in the future."

235 KHLP identified a number of key topics which were evaluated for the selection of VECs
 236 and supporting topics. Terrestrial habitat loss was selected as a supporting topic.
 237 Terrestrial habitat is an important component of Aski as it provides for ecosystem
 238 diversity and supports a variety of plant and animal species.

239 CEC requested an update of the information that was compiled by the TCN on land
 240 areas that have been affected by Manitoba Hydro projects and activities between 1955
 241 and 1994 to relate the scale of impact on terrestrial habitat due to the proposed
 242 Keeyask Generation Project and future projects/activities relative to the past projects
 243 and activities.

244 As indicated in Table 1 of CEC-IR-035 and confirmed by KHL P in Table 3, Manitoba Hydro
 245 projects and related activities have affected approximately 50,100 ha of terrestrial
 246 habitat over 40 years. As indicated in Table 1, the total area affected by all past and
 247 current projects is 61,108 ha.

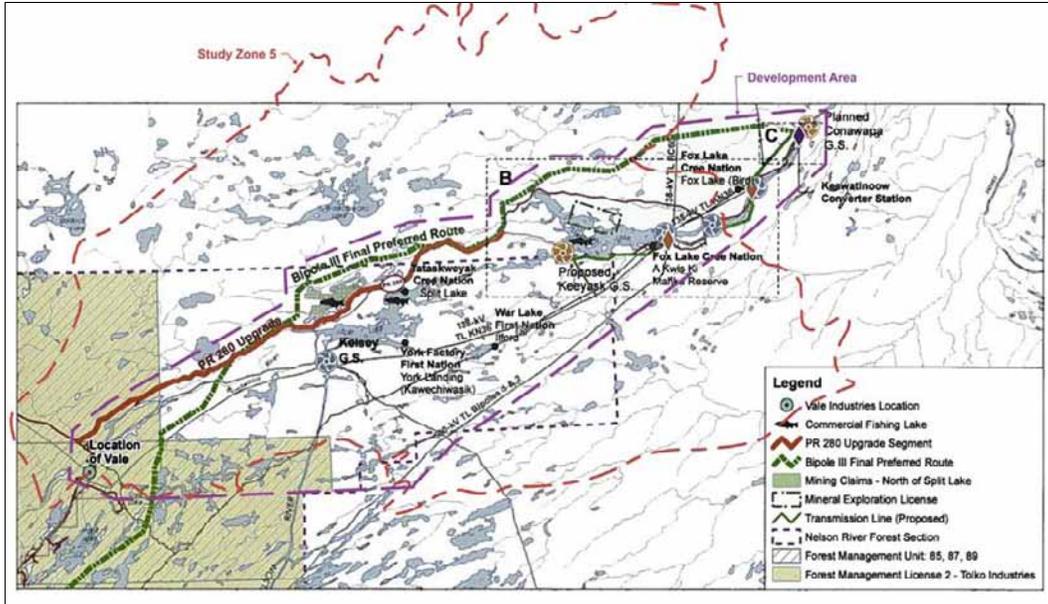
248 Based on data provided by KHL P, future projects and activities will impact an additional
 249 12,723 ha of terrestrial habitat over the next 15 years (see below).

Project	Area Affected (ha)
Keyask Generation Project	8,991
Keyask Transmission Project	944
Bipole III Transmission Project	3,630
Conawapa Generation Project	2,051
Community of Bird	132
PR 280 Upgrade	80
Gillam Re-development	N/A (153)*

* Data not provided in KHL P response to CEC-IR-030, but obtained from Table 1 response to CEC-IR-021.

250 As indicated in the Table 1 response to CEC-IR-021, a total terrestrial habitat area of
 251 71,515 ha will be impacted, representing approximately 5.6% of the Study Zone 5 area.
 252 This total impact area in the Table 1 response to CEC-IR-021 did not include the
 253 Conawapa Generation Project (Conawapa column indicating 0 ha). However, the Bipole
 254 III column (indicating 3,700 ha) appears to include all of the Bipole III Transmission
 255 Project, including the Keewatinoow CS project components (despite the Keewatinoow
 256 column indicating 0 ha). Additional questions have been posed by CEC in CEC-IR-021 to
 257 clarify this discrepancy.

258 It is noted that all of the past, current and future projects and activities resulting in a
 259 loss of 71,515 ha are confined to a much smaller area of terrestrial habitat (less than
 260 500,000 ha) overlapping the Nelson and Burntwood Rivers (see Figure 1), or
 261 approximately 15% of this overall development area.



262

263 **RESPONSE:**

264 Thank you for the comments. Although no further questions are raised, the Partnership
 265 wishes to make a few clarifications. (*Drafting note: Can, and should, a compliment*
 266 *regarding the comments be added?*)

267 Please note that the areas provided in Table 4 in the response to CEC Rd 1 CEC-0035 are
 268 for lands rather than terrestrial habitat. Some of the land areas are no longer terrestrial
 269 habitat. For example, the existing Keeyask Infrastructure Project portion of the Keeyask
 270 Generation Project land area is classified as human infrastructure rather than terrestrial
 271 habitat in the terrestrial assessment. For the amount of terrestrial habitat affected by
 272 the Keeyask Generation Project, please see Section 6.5.3.1 of the Response to EIS
 273 Guidelines or Table 1 of the response to CEC Rd 1 CEC-0021.

274 Regarding the apparent discrepancy in land areas reported for the Bipole III
 275 Transmission Project in Table 1 of the response to CEC Rd 1 CEC-0021 and Table 4 of the
 276 response to EC Rd 1 CEC-0035, accounting for variations between land and terrestrial
 277 habitat areas partially explains why different areas are reported for the Bipole III
 278 Transmission Project (please see the response to CEC Rd 2 CEC-0102b for the full
 279 explanation).

280 Regarding the final paragraph of the comments and the associated map, please note
 281 that the study zone shown on the map is Study Zone 6 rather than Study Zone 5.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
 2 **Volume; Section: N/A; Page No.: N/A**

3 **CEC Rd 2 CEC-0105**

4 **ORIGINAL PREAMBLE AND QUESTION (CEC-0037a,b,c):**

5 The conclusion that residual effects from the Keeyask Generation Project on caribou are
 6 "expected to be adverse, small to medium in extent, long term in duration, and small in
 7 magnitude." and that "there is a moderate to high degree of certainty in the
 8 assessment" is not supported by the evidence presented in the EA, which has significant
 9 deficiencies with respect to:

- 10 1. Evaluation of status of summer resident caribou;
- 11 2. Assessment of effects of summer resident caribou and their habitat;
- 12 3. Assessment of effects on migratory caribou and their habitat; and
- 13 4. Proposed Mitigation.

14 **Status of Summer Resident Caribou**

15 The Response to EIS Guidelines (R-EIS) and the Terrestrial Environment Supporting
 16 Volume (TE-SV) characterize the caribou that use the RSA as:

- 17 1. Barren-ground caribou from the Beverly-Qamanirjuaq herd
- 18 2. Coast caribou from the Cape Churchill and Pen Islands
- 19 3. Summer resident caribou.

20 According to the TE-SV (p.7-60) these "summer resident caribou are "a type of
 21 woodland caribou whose exact range and herd association is uncertain". The Project is
 22 north of the currently defined boundary of forest-dwelling woodland caribou ecotype in
 23 Manitoba (Manitoba Conservation 2006), however these summer resident caribou
 24 exhibit calving behaviour typical of forest-dwelling woodland caribou, calving singly
 25 instead of in large aggregations. According to the TE-SV, the summer resident caribou
 26 are conservatively estimated to number 20 -50 individuals, which is similar in size to the
 27 Owl-Flintstone Range that Manitoba Conservation (MC) is actively trying to conserve
 28 (Environment Canada 2012; Manitoba Conservation 2011).

29 According to FLCN (2101, p. 48) caribou were historically abundant in the local area and
 30 were harvested year round, and were the primary source of red meat. FLCN Traditional
 31 Knowledge Report (2010) recognizes the three ecotypes and has separate names for
 32 them based on behaviour, distribution, and morphology. The summer resident caribou
 33 may belong to the previously described Nelson-Hayes population of boreal woodland

34 caribou, and that this herd has not completely amalgamated with the coastal Pen Island
35 population.

36 Genetic studies indicated that most barren-ground caribou genotypes were found north
37 of the Nelson River from 2004 to 2006 (Ball and Wilson; TE-SV 7-63), but the
38 relationship between coastal woodland caribou ecotype and summer resident caribou
39 remains to be clarified. There is some evidence from collaring data that some individuals
40 may calve in the RSA but not in all years, potentially calving near the coast in
41 subsequent years and no results yet available from preliminary DNA work conducted by
42 MC and partners (S. Vick, Manitoba Conservation, pers. comm.). No collaring or genetic
43 work appears to have been conducted by the proponent for the Keeyask GS, particularly
44 summer collaring of resident caribou (i.e. those calving on Stephens Lake). Recent
45 collaring data conducted by Manitoba Conservation, Bipole III, or the Ontario Ministry of
46 Natural Resources are generally not discussed in any detail in the Keeyask EIS.

47 The status of these summer-resident caribou has potential implications with respect to
48 relevant legislation i.e., SARA, MESA and associated recovery strategies/plans.

49 **QUESTION:**

50 **Effects on Summer Resident Caribou**

51 Regardless of how they are classified, there is potential for Project-related effects on
52 summer resident caribou at the range level and below, and for calving/nursery habitat.
53 A number of major deficiencies in analysing potential impacts on habitat of forest-
54 dwelling are identified:

- 55 4. The southern portion of the Zone 6 RSA does overlap with portions of the ranges of
56 two identified forest-dwelling woodland caribou ranges i.e. Wapisu (MB8) and
57 Manitoba North (MN9). Potential direct or indirect impacts of this project on these
58 ranges is not discussed or assessed.
- 59 5. No annual range has been delineated for the summer resident caribou using
60 Stephens and Gull Lakes and the EA lacks sufficient supporting evidence to
61 determine the adequacy of the RSA (Zone 6) for characterizing such a range,
62 particularly given that some forest-dwelling woodland caribou females move 200-
63 500 km from wintering areas to calving sites (Environment Canada 2011, p. 74).
64 Furthermore, although the RSA for caribou is listed as Zone 6 (TE-SV, p 1-21),
65 cumulative effects on intactness were calculated for Zone 5 (TE-SV, p 1-20) not Zone
66 6, so the level of overall disturbance in the caribou RSA is unclear.
- 67 6. Calving and winter habitat modeling was conducted for forest-dwelling woodland
68 caribou calving habitat and winter habitat for Bipole III and includes the northern
69 half of the Keeyask GS caribou RSA. This modelling could presumably have been
70 extended to include the entire Keeyask caribou RSA and been incorporated in the

- 71 TE-SV. No justification is given for the summer resident caribou habitat models
 72 presented in the TE-SV i.e., primary calving/rearing islands defined as >10 ha. Was
 73 this based on data collected for Stephens and Gull Lakes? Attributes of used and
 74 unused calving islands in the RSA are not presented e.g., size, forest type, distance
 75 from shore, proximity to other islands, terrain, etc. This information is required to
 76 evaluate the statement in the CE-SV (p. 7-30) that "The small loss of calving habitat
 77 that will occur in the Local Study Area will in part be offset by an increase in the
 78 number of smaller islands in the Keeyask reservoir."
- 79 7. Environment Canada (2011) has shown that the probability of persistence of forest-
 80 dwelling woodland caribou population can be predicted by the proportion of
 81 anthropogenic disturbance on a range using a 500 m buffer. In the TE-SV (p 131),
 82 low use linear features were buffered only 200 m (Mace et al 1996) whereas
 83 Environment Canada uses 500 m for all anthropogenic disturbance. Existing,
 84 disturbance levels for Keeyask might therefore be underestimated.
- 85 8. The TE-SV (pp. 6-370) states that that "because changes to intactness will be
 86 negligible" and that "The Project will not contribute to measurable changes in
 87 caribou intactness of the RSA". The TE-SV predicts cores being >80% in Zone 5, but
 88 Zone 6 is the caribou RSA (and it may not accurately reflect the range) and the
 89 buffers used in the analysis were not consistent with Environment Canada (2011a).
 90 No benchmark or threshold for acceptable level of existing disturbance and
 91 additional level of disturbance was identified. EC (2011a) indicates that landscapes
 92 with more than 35% disturbed have a lower probability of persistence.
- 93 9. The TE_SV states that "because changes to intactness will be negligible, effects on
 94 caribou will likely be negligible". Although disturbance is associated with lower
 95 probability of persistence, impacts can still potentially occur below the range level.
 96 Although 500 m was used for EC persistence models, other studies have shown
 97 disturbance effects at much greater (e.g. 10 km) from anthropogenic activities.
 98 Potential impacts on caribou from project activities e.g. sensory disturbance during
 99 construction, potential increases in hunter mortality from increased access, changes
 100 in predator prey dynamics from linear disturbance.
- 101 10. Calving islands. The TE-SV states (7-61) "potential calving habitats are common in
 102 the Regional Study Area, and habitat does not appear to be limiting to the summer
 103 resident cows and calves". The fact that only a small proportion of available habitat
 104 is used is not the point, since the anti-predator strategy of forest-dwelling woodland
 105 caribou is to spread out a low density across the landscape (i.e., one would expect
 106 low numbers and low densities). It appears Stephens Lake is a regionally significant
 107 calving lake, with some on calving on Gull Lake as well. Caribou are potentially most
 108 sensitive during calving/nursery; impacts from construction and increased boat
 109 access on both Gull and Stephens Lake are poorly quantified and it is unsure if
 110 mitigation is sufficient.

111 11. Cumulative impacts from all foreseeable projects are not adequately addressed. The
 112 EA states that the Keeyask Generation Project will reduce linear feature density
 113 (Response to EIS 6-325). However, it is clear that the Keeyask Transmission Project,
 114 the Bipole III Transmission Project, and the Keeyask Infrastructure Project are
 115 dependent upon each other and are part of the same overall undertaking. The net
 116 effect will be increased linear feature density in the RSA which needs to be clear in
 117 the cumulative effects section since it will negatively impact caribou. The statement
 118 in the Cumulative Effects Assessment (TE-SV p 7-29) "most effects of the Project will
 119 be negligible to small, particularly since habitat currently appears to be
 120 underutilized" is unsubstantiated and does not reflect the current understanding of
 121 woodland caribou ecology (e.g., bottom-up up versus top-down population
 122 regulation).

123 **Effects on Migratory Caribou**

124 The Project has the potential to impact winter habitat of migratory barren-ground
 125 caribou (Qamanirjuaq) and forest-tundra woodland caribou (i.e. coastal caribou – Cape
 126 Churchill and Pen Island) and traditional crossing sites on the Nelson River. According to
 127 the TE-SV (p 7-63) there are generally about 300 Pen Island caribou and less than 50
 128 Cape Churchill caribou in the RSA during a typical winter, although larger numbers (100s
 129 to 1000s) are observed in some years. Approximately 10,000 Qamanirjuaq caribou have
 130 been estimated to reach the RSA in some winters, although this type of occurrence is
 131 "infrequent". Although infrequent, their use of the RSA could be ecologically and
 132 culturally significant. The TE SV (7-146) states that the Project is not anticipated to
 133 "measurable affect" caribou in the RSA; however, "measurable affecting" is not the
 134 criterion used to determine significance of residual or cumulative effects.

135 Several main deficiencies are identified:

136 12. Assessment of disturbance impacts to winter habitat. One of the factors cited as
 137 potentially contributing to the potential decline in the Qamanirjuaq herd is loss of
 138 winter habitat from forest fires; anthropogenic disturbance could also affect winter
 139 habitat use, particularly if other portions of their winter range are unavailable due
 140 to snow conditions, fire or other disturbance. Resource Selection Function (RSF)
 141 models for BiPole III were not used to assess winter habitat in the RSA.

142 13. Traditional crossing sites for migratory caribou. Although the Nelson River generally
 143 serves as an extra-limital boundary for Qamanirjuaq barren-ground caribou in the
 144 Keeyask region, river crossing locations have been reported in the RSA and lower
 145 Nelson River. FLCN (2012, p. 25) states that fluctuating water levels can affect
 146 caribou since caribou cannot cross the river safely until the levels are low enough.
 147 Drowning has been observed along the Kischi Sipi. (Nelson River) according to FLCN
 148 (2012). The TE-SV (pp. 7-62) states "after the construction of the Kettle GS, there

- 149 were virtually none south of the Nelson River". It is not clear whether a causal
 150 relation is implied. Potential impacts on crossing sites needs a more complete
 151 analysis (e.g. comparison with other sites on the Nelson) since the earlier formation
 152 of thin ice across the reservoir coincides with arrival of caribou in the LSA.
- 153 14. Cumulative effects from other related projects as well as other existing or
 154 reasonably foreseeable projects in the RSA on winter habitat and traditional
 155 crossing sites. Monitoring was conducted for the other related projects (e.g., Bipole
 156 III, Keeyask Transmission, Road and Infrastructure) should be better incorporated in
 157 this EA. In particular, the impacts of linear corridors such as transmission rights-of-
 158 way and the upgraded provincial highway (PR 280) need to be examined in more
 159 detail for disturbance effects and increased hunter mortality.
- 160 15. The rationale for the Caribou Access Program and an annual hunt needs to be
 161 justified given: a) the report states that there are no measurable effects on caribou
 162 (TE-SV 7-35) and b) migratory coastal (Pen Island, Cape Churchill) and barren-ground
 163 (Qamanirjuaq) caribou do not winter every year in the Keeyask area and c) given
 164 that access to the LSA will increase due to the road upgrades and transmission
 165 ROW. The statement that "Recreational fishers and hunters may [bold added] make
 166 use of the new boat launch facilities up and downstream of the GS in the operation
 167 phase" is inconsistent with existing resource use patterns where access is a key
 168 issue and appears to understate the issue since it is likely that there will be
 169 increased recreational hunting and angling upstream and downstream of the GS.
 170 The statement "that residual effects to recreational resource users are expected to
 171 be neutral Resource Use SV pp. 1-94)" is questionable and the lack of proposed
 172 mitigation a potential risk to caribou. The potential impact of the Caribou Access
 173 Program on caribou outside the RSA also needs to be analyzed and presented in the
 174 TE-SV.

175 **Proposed Mitigation**

176 The following measures were proposed for mitigation of potential Project-related
 177 impacts on caribou, with deficiencies noted:

- 178 16. Minimizing blasting from May 15-June 30 (p. 6-370). It is not clear if any modeling of
 179 noise impacts on caribou in Stephens Lake and the LSA has been undertaken, and on
 180 what basis these dates were derived, nor the justification for minimize vs. no
 181 blasting during that time period.
- 182 17. Implementing an access management plan, including locked gates at the north and
 183 south dykes from May 15 to June 30, as well as during other sensitive time
 184 determined through monitoring (6-371). Shouldn't these "sensitive times" be
 185 determined pre-construction to mitigate access effects prior to and during

- 186 construction as well? It is not clear how effective these actions will be to prevent
 187 improved access by hunters to Stephens Lake during the operations phase.
- 188 18. Blocking and revegetating project-related cutlines and trails within 100 m of project
 189 footprint (p. 6-374). The rationale for 100 m compared to 500 m (as used in EC
 190 disturbance analysis) is not provided.
- 191 19. Long-term monitoring of caribou and predators in the project area (p. 8-23, 8-26). It
 192 is unclear from if there is sufficient commitment to monitoring, particularly with
 193 respect to summer resident caribou e.g. collaring, genetic analyses.
- 194 It is not clear if mitigation for other potential impacts was considered, such as
 195 reduced speed limits to minimize risk of collisions, any mitigation for lights, and
 196 reducing sight lines on corridors.

197 **FOLLOW-UP QUESTION:**

198 Uncertainty remains on the abundance, distribution, and relative habitat use of summer
 199 resident caribou and how that may influence assessment of current status and potential
 200 impacts. Confirmed caribou calving was predominantly on Stephens Lake islands
 201 compared to surveyed peatland "islands" (see TE-SV Map 7.32) although summer
 202 caribou tracking transect results (TE-SV Map 7-34) appear to indicate more widespread
 203 use of calving habitat in peatlands. How much confidence can be placed in field crews'
 204 ability to distinguish calf from adult caribou signs in peatland environments and how
 205 much certainty can be placed on the assumption from CEC-IR-037 (p 357) that "there is
 206 a similar quality of calving habitat distributed throughout the landscapes in study
 207 zones..."? If the assumption is incorrect, that also increases uncertainty regarding the
 208 number of summer resident caribou in the LSA and RSA, and ultimately their population
 209 sustainability. If the assumption is correct and the estimated population for Zone 5 is
 210 128-320 animals, why is the figure of 20-50 animals from Zone 4 used on line 215 p 359
 211 of IR response? Is 20 caribou also "the most conservative population estimate" used on
 212 line 388 p 364 when discussing Study Zone 5? Whether the population is considered
 213 sustainable or not according to EC models as discussed on p 359-60 depends on which
 214 population value and RSA are used.

215 **RESPONSE:**

216 The field crew's ability to distinguish caribou adult and calf sign can vary depending on
 217 the substrate assessed, including detections on peatland complexes. The high
 218 occurrence of sphagnum moss on peatland islands most often provides a suitable
 219 substrate for identifying fresh tracks and confidence is high. Other factors contributing
 220 to the successful detection of caribou adults and calves includes training of field crew
 221 members on the detection of caribou tracks, surveys occurring multiple times over each
 222 field season, the presence of trail cameras on select transects and the participation of

223 First Nations field assistants who have experience tracking and detecting sign. Tracks or
224 old sign that are difficult to assess are classed as unknowns and not used in analysis.

225 The response to CEC Rd 1 CEC-0024 reviews the justification for the assumption of their
226 being similar a similar proportion of peatland complex habitat in Study Zone 5 levels
227 observed in Study Zone 4 (the Caribou Local Study Area). The caribou peatland calving
228 complexes were typed using orthophoto imagery interpretation up to 69% coverage of
229 Zone 6 (the Caribou Regional Study Area). To validate habitat, those peatland complexes
230 that were selected for field studies were visually examined by helicopter for the
231 presence of islands and a surrounding wet matrix prior to establishing a tracking
232 transect. If island(s) and wet matrix were not present at the potential sample site,
233 tracking transects were not established. The presence of potential calving and rearing
234 peatland complexes and islands in lakes in Study Zone 6 was determined through
235 surveys of these areas which indicated a minimum of 204,420 ha of primary and
236 secondary habitat in comparison to the 13,995 ha currently available in the Caribou
237 Local Study Area. Please see response CEC Rd 1 CEC-0021 for further detail on the
238 quantity of calving and rearing habitat available in the Caribou Local and Regional Study
239 Areas.

240 The reason for the extrapolation of the estimate of the 20-50 animals from the Caribou
241 Local Study Area to the Caribou Regional Study Area was to provide more detailed
242 information on the possible extent and size of caribou groups in the area. As described
243 above, population size is an important consideration in the viability of a caribou
244 population. The Environment Canada (2012) model also bases population growth on the
245 extent of undisturbed habitat in a population range. The portion of disturbed habitat on
246 the landscape, buffered by 500 m, was used in assessing Project-related effects in both
247 the Caribou Local and Regional Study Areas (CEC Rd 1 CEC-0021).

248 The indication that the estimate of 20-50 caribou provided for the Caribou Local Study
249 Area is different than the estimate of 128-320 animals for the larger Study Zone 5 is
250 correct. Notably, two methods of extrapolating were applied to estimate the potential
251 number of caribou in Study Zone 5 and Study Zone 6 (see Table 1 of the response to CEC
252 Rd 1 CEC-0037a). One method was based on the relative sizing of the Local Study Area in
253 comparison with Study Zone 5 and Study Zone 6 and extending the estimate of 20-50
254 animals proportional to the number of hectares of these areas. The second
255 extrapolation method, used to estimate the number of caribou in Study Zones 4-6, was
256 based on an estimate for the delineated Manitoba population (Environment Canada
257 2011) where the average number of caribou for this range was calculated per hectare
258 and alternately applied to these Study Zones. The estimates provided using this latter
259 method were lower than those calculated based on the extrapolation of Study Zone 4
260 numbers, and it was considered the more conservative estimate. The initial estimate of

261 20-50 animals for the Caribou Local Study Area was based on trail-camera studies where
262 an attempt was made to count the minimum number and the possible range of the
263 number of caribou using calving and rearing areas in a single season and was not an
264 extrapolation.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
 2 **Volume; Section: N/A; Page No.: N/A**

3 **CEC Rd 2 CEC-0106**

4 **ORIGINAL PREAMBLE AND QUESTION (CEC-0042):**

5 Several deficiencies are noted with respect to potential noise impacts on wildlife,
 6 notably summer resident caribou on Stephens Lake, nesting and migrating waterfowl,
 7 nesting gulls and terns, and breeding songbirds (including SAR).

8 These deficiencies include:

- 9 • The study area for noise includes “the general footprint of the principal generating
 10 station structures and reservoir, as well as access roads and other supporting
 11 infrastructure” (PE-SV, p. 3-4). Given that Gull Rapids can be heard as far away as 18
 12 km (PE-SV p. 3-6) and construction noises can extend far beyond the footprint, it is
 13 not clear that this LSA is adequate for characterizing baseline conditions or assessing
 14 potential impacts.
- 15 • No baseline monitoring of existing noise levels noise at the Project site, reservoir,
 16 and access roads was conducted. The characterization of the LSA that “it is expected
 17 that the ambient noise profile would be consistent with isolated, remote northern
 18 geographic areas” with “the expected outdoor average sounds levels in the range of
 19 35 dB to 45 dB” is unsupported. Gull Rapids is a significant noise source and there
 20 will be spatial variation in the LSA depending upon local topography and vegetation.
- 21 • No predictive modelling for construction and operational phase of the project was
 22 undertaken for blasting, traffic, or general construction activities. Potential noise
 23 impacts vary depending on a number of factors including taxa, distance from source,
 24 noise frequency (kHz) and magnitude, and type (percussive vs. continuous), but
 25 these are not addressed.
- 26 • The construction noise is described as “construction activity will cause elevated
 27 noise levels within the immediate construction site, with sound propagating away
 28 from the origin of the noise and attenuating with distance back to normal ambient
 29 noise levels for the local study area”. No supporting data or values are provided for
 30 the magnitude, frequency (kHz), or distance.
- 31 • Characterization of the noise impacts is inconsistent. For example, Table 3.4-5 (PE-
 32 SV, p. 3-19) indicates that noise will be “intermittent” but the text (p 3-18) mentions
 33 “continuous” noise. The duration is described as “short” although construction
 34 activities will take place over multiple years, variously described as 6 to 8.5 years
 35 (PE-SV, p. 3.7, 3-11, 3-13), which is longer than the typical lifespan of some
 36 potentially affected species.

- 37 • Information provided on mitigation measures is inadequate to assess their
 38 effectiveness, particularly timing windows and the criteria for assessing when and
 39 how mitigation will be applied. The Proponent indicates that blasting will be
 40 undertaken outside of the sensitive breeding period (April 1-July 31) for birds “to
 41 the extent practicable” to minimize disturbance to breeding birds (TE-SV, p. 6-341,
 42 343; PE-SV p.3-13) and from May 15 to June 30 for calving woodland caribou.
 43 However, “to the extent practicable” is not defined, minimizing impacts is not
 44 equivalent to having no impacts. The proposed mitigation measures do not address
 45 other, non-blasting, construction noise.

46 **FOLLOW-UP QUESTION:**

47 It is still not clear what was used as the LSA for noise impacts or to what distance noise
 48 impacts are anticipated for caribou calving. Map 7-44 of the TE-SV shows “affected
 49 calving areas” in Zone 2 (footprint + 150 m) but it is not clear if that implies just those
 50 directly impacted from clearing or flooding. The TE-SV (p 7-113) states that “In heavy
 51 construction areas, some summer resident caribou activity will likely decline within 2 km
 52 of the south access road and up to at least 4 km from the GS, which will most likely
 53 result in a loss of effective habitat (Manitoba Hydro 2011c).” and woodland caribou
 54 activity decreased approximately 80% within 4 km of the Wuskawatim generating
 55 station site after construction began. On p 7-114 it states that about 1250 ha or 9% of
 56 the primary and secondary caribou calving and rearing habitat in the LSA will be
 57 affected, but it is not clear on what this is based since no predictive modelling was
 58 conducted. The cited reference (Manitoba Hydro 2011c) is for the Wuskawatim project,
 59 and it isn't clear what was used for the distance to which noise impacts are predicted for
 60 the Keeyask project. Please clarify which study area and/or distance(s) were used for
 61 predicting impacts from noise and other construction disturbance and the distance
 62 noise impacts on caribou (calving and winter). Please provide cited reference Manitoba
 63 Hydro 2011c.

64 **RESPONSE:**

65 *Please clarify which study area and/or distance(s) were used for predicting impacts from*
 66 *noise and other construction disturbance and the distance noise impacts on caribou*
 67 *(calving and winter).*

68 Study Zone 3 was used to calculate the predicted effects of sensory disturbance on
 69 caribou. Based on studies conducted during construction of the Wuskawatim Generating
 70 Station (GS), it was estimated that summer resident caribou activity would likely decline
 71 within 2 km of the south access road and up to at least 4 km from the GS during Keeyask
 72 construction (Manitoba Hydro 2011c). Study Zone 3, which is a buffer of 1.15 km around
 73 the Project footprint, may underestimate the amount of habitat affected by potential
 74 sensory disturbances in some project footprint areas and may overestimate it in areas

75 with less sensory disturbances. On average, however, Study Zone 3 is thought to be a
 76 good surrogate area as a general predictive model for capturing these effects. The area
 77 contained within this buffer also captures the large majority of the area within 4 km of
 78 the Keeyask GS related to potential blasting effects, and to the presence of people and
 79 machinery at the site.

80 As indicated on p. 7-112 of the TE SV, Map 7-44 refers to physical habitat loss; habitat
 81 that will be directly affected (removed) in Study Zone 2 (purple and orange areas in Map
 82 1). Nine per cent of primary and secondary habitat was based on the loss of effective
 83 habitat in Study Zone 3 excluding Study Zone 2 (i.e., the blue area in Map 1). Study Zone
 84 2 was not included because it will be physically removed during construction. Please see
 85 the response to CEC Rd 1 CEC-0037c for more detail about the calculation of the amount
 86 of effective habitat loss. This calculation of the loss of effective habitat is for the
 87 construction phase only.

88 Effects during operation and residual effects are described in Section 7.4.6.2.2 of the TE
 89 SV. Additionally, Environment Canada (2012) demonstrates "that the application of a
 90 500 m buffer to mapped anthropogenic features best represents the combined effects
 91 of increased predation and avoidance on caribou population trends at the national
 92 scale" (p. 14). As such, effects of residual disturbances during operation are often
 93 described within 500 m of developments such as the access roads.

94 *Please provide cited reference Manitoba Hydro 2011c.*

95 The reference for Manitoba Hydro 2011c was listed in the References section of the TE
 96 SV and is available at [http://keeyask.com/wp/wp-](http://keeyask.com/wp/wp-content/uploads/2013/07/Wuskwatim-Generation-Project-Access-Road-Report-2004-2009-WRCS-June-20_2011.pdf)
 97 [content/uploads/2013/07/Wuskwatim-Generation-Project-Access-Road-Report-2004-](http://keeyask.com/wp/wp-content/uploads/2013/07/Wuskwatim-Generation-Project-Access-Road-Report-2004-2009-WRCS-June-20_2011.pdf)
 98 [2009-WRCS-June-20_2011.pdf](http://keeyask.com/wp/wp-content/uploads/2013/07/Wuskwatim-Generation-Project-Access-Road-Report-2004-2009-WRCS-June-20_2011.pdf):

99 Manitoba Hydro. 2011c. Wuskwatim Generation Project. Mammal Monitoring
 100 Investigations for the Wuskwatim Generation Project Pre-construction and
 101 Construction Report (2004-2009). Prepared for Manitoba Hydro by Wildlife
 102 Resource Consulting Services MB Inc. Winnipeg, MB. 186 pp.

103 **REFERENCES:**

104 Environment Canada. 2012. Recovery strategy for the woodland caribou (*Rangifer*
 105 *taranudus caribou*), Boreal population, in Canada. *Species at Risk Act Recovery*
 106 *Strategy Series*. Environment Canada, Ottawa, ON. Xi + 138 pp.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
 2 **Volume; Section: 6.5.7.2.5 Conclusion about Residual Effects on**
 3 **Mallard; Page No.: 6-345**

4 **CEC Rd 2 CEC-0107**

5 **ORIGINAL PREAMBLE AND QUESTION (CEC-0041):**

6 It is not clear how riparian wetlands on smaller tributaries and constructed wetlands will
 7 replace those on the Nelson River used by VECs, particularly mallards and Canada geese.
 8 YFFN has indicated fewer geese and ducks in the Split Lake area because the shoreline
 9 habitat that they use has been flooded and eroded, and FLCN stated that after hydro
 10 flooding and the loss of stable shoreline, the number of nesting waterfowl declined
 11 (Response to EIS guidelines p. 6-13).

12 The number of nesting and staging mallards is much higher on Nelson River, Gull Lake,
 13 Clark Lake, than inland lakes or Stephens Reservoir but impacts are not well quantified.

14 The TE-SV (6-347) states that there is currently limited breeding habitat within the
 15 Project effects area; if this is true (only 3% of the breeding habitat is affected), the
 16 rationale for creating mallard nesting platforms is questionable.

17 The conclusion on residual effects (TE-SV 6-347) makes no mention of foraging habitat
 18 in riparian wetlands even though there will be a long-term loss of these areas due to the
 19 flooding of the reservoir.

20 It is also not clear how impacts were measured against thresholds to determine
 21 significance of effects.

22 Effects on mallards were characterized as "small" in magnitude and within the range of
 23 natural variability. However, no evidence was presented on the range of natural
 24 variability in mallard populations in the RSA nor what the population-level effect was
 25 predicted to be (e.g. # of nesting pairs/individuals), and it is not clear how the long-term
 26 loss in riparian wetlands on the Nelson River could be characterized as within the range
 27 of natural variation.

28 Overall potential Project-related residual effects on Canada geese are also expected to
 29 be adverse but regionally acceptable, "largely because there is considerable amount of
 30 other available staging habitat in the region" but the evidence presented for staging
 31 habitat elsewhere in the RSA does not support that statement.

32 The TE-SV states that "It is expected that until suitable shoreline wetland vegetation re-
 33 establishes in the reservoir, geese use of the reservoir during the migration periods will

34 be minimal during operation". Given that Stephens Lake does not support many staging
 35 Canada geese compared to Gull Lake, this suggests staging habitat has not recovered
 36 over 20 years since the construction of the Kettle GS.

37 According to the Response to EIS Guidelines (6-113) "the quality of inlets and bays along
 38 the Nelson River and Gull Lake as staging habitat for mallards will to continue to vary
 39 depending upon river water levels. How proposed changes to water management (e.g.,
 40 peaking, seasonal timing, etc.) on Gull Reservoir will affect wildlife compared to the
 41 current regime needs to be more fully assessed.

42 **FOLLOW-UP QUESTION:**

43 There is a discrepancy in the amount of mallard breeding habitat presented in the TE-SV
 44 and the IR responses #41 and for Cumulative Effects (Table 2. Bird VECs: habitat
 45 available and habitat affected by Keeyask and Past, Present Potential Future Projects).
 46 The TE-SV (p. 6-47) states that approximately 3% of the RSA (1908 ha) of mallard
 47 breeding habitat will be lost during construction and operation, whereas The CEC-IR-041
 48 response (p. 411, lines 91-93) states that approximately 5% of the 67,132 ha of mallard
 49 breeding habitat in the RSA (3356 ha) will be lost. The CEC-IR-0022 Table 2 indicates
 50 2,958 ha of mallard breeding habitat lost. Please explain the discrepancies. On p 41, line
 51 90 it states there is 64,425 ha of mallard breeding habitat and the following sentence
 52 states there is 67,132 ha of potential mallard breeding habitat; what is the difference
 53 between the two?

54 **RESPONSE:**

55 The following explains these differences:

- 56 • The TE SV used 1:50,000 mapping and assumed no feasible breeding habitat in the
 57 Nelson River wetlands. This resulted in figures of 64,425 ha of mallard breeding
 58 habitat, with a loss of 1908 ha (3%).
- 59 • Updated figures were provided in drafting responses to CEC Rd 1 CEC-0021 and CEC
 60 Rd 1 CEC-0041 based on a more detailed (1:15,000 scale) map of aquatic areas
 61 which had been available but inadvertently missed in calculating the original
 62 amount of mallard habitat. In addition, to take the most conservative approach to
 63 the potential loss of mallard breeding habitat, the updated figures included in the
 64 responses included the loss of Nelson River fen and marsh shoreline wetlands. This
 65 resulted in updated figures of 68,860 ha of mallard breeding habitat (67,132 ha in
 66 off-system areas plus 1,728 ha in on-system areas), with a loss of 2,958 ha (4.3%).
- 67 • The updated figures do not change the conclusions regarding significance.
- 68 • In the response to CEC Rd 1 CEC-0041, line 91, the original calculated number used
 69 in the TE SV (64,425 ha) was inadvertently reported.

1 **REFERENCE: Volume: Aquatic Environment Supporting Volume;**
2 **Section: N/A; Page No.: N/A**

3 **CEC Rd 2 CEC-0108**

4 **ORIGINAL PREAMBLE AND QUESTION (CEC-0048):**

5 Overall, the analysis of potential increases in fish mercury concentrations in Keeyask
6 Reservoir reaches reasonable conclusions. Baseline fish mercury concentrations are
7 adequately characterized and fish mercury concentrations are predicted to increase,
8 consistent with observations from existing reservoirs after flooding occurs. The
9 predicted peak concentrations, and the duration of increased concentrations (up to 30
10 years) are within the range observed for other reservoirs on the Canadian Shield. Fish
11 mercury concentrations are also predicted to increase in Stephens Lake, although
12 significantly less than in Keeyask Reservoir.

13 The downstream limit of increased fish mercury concentrations appears to be Stephens
14 Lake. A clear rationale for this limit would be useful. As well, little information was
15 found on the expected upstream limit of increased fish mercury concentrations (e.g., if
16 fish move upstream of the reservoir). Even if the effects beyond the Reservoir and
17 Stephens Lake are expected to be nil/negligible the rationale should be discussed.

18 **FOLLOW-UP QUESTION:**

19 In the response to CEC Rd 1 CEC-0048, at the end of the second paragraph it is indicated
20 that "Thus, methylmercury export via suspended particular matter or invertebrates
21 from Stephens Lake to further downstream will likely be much reduced, limiting the
22 potential for post-Project increases in fish mercury concentrations beyond Stephens
23 Lake. These conclusions are supported by empirical results for reservoirs in Quebec and
24 Labrador."

25 Generally, studies from Hydro Quebec have revealed that MeHg levels decrease when a
26 large waterbody is encountered. However, the above assumes that the Stephens Lake
27 Reservoir has similar characteristics to the downstream waterbodies in Quebec and
28 Labrador referred to in the Schetagne et. al, 2003 paper. Are the characteristics of these
29 waters referred to in the Schetagne paper analogous to the Stephens Lake Reservoir? Or
30 put another way, what evidence is there that Stephens Lake will trap particulate matter
31 in the same way as the Quebec and Labrador downstream waterbodies? Please explain.
32 As well, the above stated conclusion would likely not account for potential entrainment
33 of fish with higher mercury levels from Stephens Lake due to injury/mortality as forage
34 in the tailraces of Kettle, Long Spruce and Limestone GSs and therefore resulting in
35 elevated concentrations in feeding fish. This situation has been associated with large

36 hydroelectric plants in Quebec and Labrador (Brouard et. al., 1994; Anderson, 2011).
37 The rationale given to support the conclusion that MeHg concentration in water and
38 plankton downstream of Stephens Lake is plausible but is viewed as more of a
39 hypothesis than a highly confident outcome by this reviewer. It is therefore
40 recommended that downstream monitoring be carried out to support the proponent's
41 expectations, as a matter of prudence.

42 **REFERENCES:**

43 Anderson, M.R. 2011. Duration and Extent of Elevated Mercury Levels in Downstream
44 Fish Following Reservoir Creation. *River Syst.* 19: 167-176.

45 Brouard, D., J-F. Doyon and R. Schetagne 1994. Amplification of Mercury Concentrations
46 in Lake Whitefish (*Coregonus clupeaformis*) Downstream of the La Grande 2
47 Reservoir, James Bay, Quebec, pp. 369 – 380. In: C.J. Watras and J.W. Huckabee
48 [Eds.]. *Mercury Pollution: Integration and Synthesis. Internat. Conf. Mercury as
49 a Global Pollutant (1992)*, Monterey, California, Lewis Publishers, Boca Raton,
50 Florida.

51 **RESPONSE:**

52 Although the Partnership feels that mercury in fish will not measurably increase
53 downstream of Stephens Lake for the reasons provided in the assessment, the
54 uncertainty in this conclusion is recognized since the conditions that result in the
55 downstream export of mercury are not fully understood and vary among reservoirs.
56 Therefore, monitoring will occur in downstream reservoirs if mean maximum
57 concentrations (based on standard length fish) exceed the predicted value of 0.5 ppm in
58 Walleye and Northern Pike in Stephens Lake. Monitoring would occur first in the
59 adjacent reservoir (i.e., Long Spruce Forebay) and extend further downstream if mean
60 concentrations (based on standard length fish) exceed 0.5 ppm.

1 **REFERENCE: Volume: Aquatic Environment Supporting Volume;**
2 **Section: N/A; Page No.: 7E-3**

3 **CEC Rd 2 CEC-0109**

4 **ORIGINAL PREAMBLE AND QUESTION (CEC-0051b):**

5 It is not clear that the modifications to the regression model for fish Hg burden
6 described on AE SV p. 7E-3 are valid. Specifically, the authors replaced the original
7 intercept coefficient of the regression line for fish Hg burden with a value meant to
8 reflect site-specific conditions for the Keeyask study area. The slope of the line was not
9 changed. The overall result is a lower predicted fish Hg burden (and concentration) than
10 if the original regression model was used. Are the slope and intercept of the regression
11 equation only valid however as a combination that optimizes the model fit to the data?
12 If the intercept is forced to change, should the regression line be re-fitted to the overall
13 set of observations from reservoirs, which would produce a different slope, and
14 different predicted fish Hg level than presented here?

15 **FOLLOW-UP QUESTION:**

16 The Response to 51-b states that the slope and intercept of the regression model are
17 independent of each other, with the intercept representing existing conditions (no
18 flooding), and the slope defining the increase that occurs due to flooding. This reviewer,
19 in contrast, has the view that the intercept and slope of the regression are highly
20 dependent on each other, and combine to optimize the model fit to observations. If the
21 existing baseline fish Hg concentration for Keeyask is set as the intercept, the regression
22 should be re-optimized to go through that intercept and still provide the best overall fit
23 to observations from reservoirs that had flooding. The resulting values for the intercept
24 and slope would then be used to make predictions for Keeyask. The intercept can be
25 seen as the existing concentration, and the slope can be seen as the increase due to
26 flooding, as the proponent indicated. It is the method used to estimate the slope and
27 intercept that the reviewer disagrees with.

28 **RESPONSE:**

29 The method used is in agreement with the approach applied by other mercury
30 specialists in Manitoba. The slope of the regression equation defines the relationship of
31 increased amounts of flooding and increased mercury concentrations in fish flesh. This
32 relationship was developed for a large number of reservoirs and the intercept in the
33 original equation reflected pre-flood conditions as defined by the average of all the
34 reservoirs used in the model. When the model is used to predict post-flood mercury
35 concentrations in a particular waterbody, the intercept must be adjusted to reflect the
36 existing level, which may be lower, higher or similar to the average of the waterbodies

37 that were used to develop the model. If the intercept is not adjusted, nonsensical
38 results can result (e.g., mercury levels could decline in a waterbody with high existing
39 mercury concentrations and a small amount of flooding).

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 4.6.14**
2 **Water and Wastewater Treatment; Page No.: 4-39 and 4-54**

3 **CEC Rd 2 CFLGC-0025a**

4 **ORIGINAL PREAMBLE AND QUESTION (CFLGC-0013):**

5 On page 4-39, it is stated that "Filtered backwash from the water treatment plant
6 operations will be discharged to the Nelson River" This "effluent quality will meet or
7 exceed Manitoba's standards..." Please explain how:

- 8 1. the community was informed of this process and their responses to the effluence,
9 especially the Fishermen and Elders from FL
- 10 2. the data may exceed Manitoba's standards
- 11 3. the research was completed for alternative means of treating wastewater and fecal
12 matter for current and future projects

13 Ekosi.

14 **FOLLOW-UP QUESTION:**

15 Ln 36 – if the data of effluence was shared between the Gov and Manitoba Hudro, were
16 the Elders and fishermen present at these meetings (since they are the most impacted?)

17 **RESPONSE:**

18 The original response described the extensive process to gather perspectives from
19 Community Members, including Elders and resource users. Water quality was an
20 important topic often discussed at the various meetings and representatives from the
21 Partnership made sure that this concern was discussed at meetings with regulators. In
22 accordance with Section 3.1.1 of the JKDA, KCNs were provided the opportunity to
23 participate in meetings with regulatory authorities relating to the preparation and filing
24 of the EIS. Meetings with regulators were typically small technical sessions where
25 Partnership representatives explained how they were addressing issues such as water
26 quality–strategies informed by Community processes. KCNs representatives at these
27 meetings were determined by each community.

1 **REFERENCE: Volume: N/A; Section: N/A; Page No.: N/A**

2 **CEC Rd 2 CFLGC-0025b**

3 **ORIGINAL PREAMBLE AND QUESTION (CFLGC-0013):**

4 On page 4-39, it is stated that "Filtered backwash from the water treatment plant
5 operations will be discharged to the Nelson River" This "effluent quality will meet or
6 exceed Manitoba's standards..." Please explain how:

- 7 1. the community was informed of this process and their responses to the effluence,
8 especially the Fishermen and Elders from FL
- 9 2. the data may exceed Manitoba's standards
- 10 3. the research was completed for alternative means of treating wastewater and fecal
11 matter for current and future projects

12 Ekosi.

13 **FOLLOW-UP QUESTION:**

14 Ln 52-53 – how often will the effluence exceed manitoba's levels? How will this be
15 monitored? What will be done to ensure no large concentrations of faecal matter will
16 be washed up on shore? By how much will these concentrations be exceeded? Will
17 larger amounts exceed at specific times of the year, ex. In the spring?

18 How will local populations be informed in these levels are exceeded? How will the
19 Elders and fishermen be informed, or how will their concerns over fecal matter in the
20 water be addressed?

21 **RESPONSE:**

22 It is assumed the question is referring to effluent produced from the wastewater
23 treatment plant and not the potable water treatment plant backwash, which will be
24 sent to the wastewater treatment plant and not the Nelson River (see response to CEC
25 Rd 1 CFLGC-0013 for additional information).

26 *1. Ln 52-53 – how often will the effluence exceed manitoba's levels?*

27 Lines 50 – 54 in CFLGC-0013 states "...treated effluent from the wastewater-treatment
28 plants will be at or below the concentrations stipulated in Manitoba's Tier 1 Water
29 Quality Standards, i.e., at or "exceed" the requirements for fecal coliform. The standard
30 is that the water must be at or below 200 fecal coliform organisms/100 mL."

31 "Exceed" in this context means that effluent will be of better quality than what is listed
32 in Manitoba's Tier 1 Water Quality Standards.

33 The wastewater treatment plant will be operated so the effluent entering the Nelson
34 River meets or is of better quality than what is listed in both Manitoba's Tier 1 Water
35 Quality Standards and the Manitoba *Environment Act* Licence No. 2952 (The Licence),
36 which stipulates how the plant must be operated. Although not anticipated, if the
37 results from monitoring the effluent show that one or more parameters are greater
38 than what is stated in the Manitoba's Tier 1 Water Quality Standards or the Licence, the
39 Province would be notified and the treatment issue leading to the elevated result would
40 be investigated and corrected.

41 *2. How will this be monitored?*

42 Effluent monitoring will be conducted in accordance to the Licence, which outlines the
43 monitoring and reporting process to be followed during wastewater treatment plant
44 operation. There are many different parameters that must be monitored in the
45 effluent. Samples will be collected on a monthly basis immediately after ultraviolet
46 disinfection, which will be the last step in the wastewater treatment process before the
47 effluent is discharged to the river. The samples collected will be analyzed in a
48 laboratory and the results will be available for the Province to review at any time to
49 confirm compliance with the Licence. The Province is entitled to monitor wastewater
50 effluent and examine the wastewater treatment plant any time they choose to.

51 *3. What will be done to ensure no large concentrations of faecal matter will be washed
52 up on shore?*

53 The wastewater treatment plant will be designed to remove fecal matter from the
54 wastewater during the wastewater treatment process. To make sure that wastewater
55 treatment is working well, the final effluent will be monitored for fecal coliforms prior to
56 discharge to the Nelson River. According to the Licence, the effluent must meet the
57 Licence condition for fecal coliform bacteria (which is an indication of the amount of
58 fecal material entering the river) at all times. Finally, the wastewater will be discharged
59 to the main channel of the Nelson River, where it will be quickly mixed with a large
60 volume of water. For these reasons, there will be no large concentration of fecal matter
61 washing up on shore as a result of wastewater effluent being discharged from the site.

62 *4. By how much will these concentrations be exceeded?*

63 See answer to Question 1 above. It is expected that the wastewater will be of better
64 quality than (exceed) Manitoba's Tier 1 Water Quality Standards and the Licence at all
65 times.

66 5. *Will larger amounts exceed at specific times of the year, ex. In the spring?*

67 The wastewater treatment plant will operate and release effluent to the environment
68 continually, every day of the year. The time of the year has no bearing on wastewater
69 quality.

70 6. *How will local populations be informed in these levels are exceeded? How will the*
71 *Elders and fishermen be informed, or how will their concerns over fecal matter in the*
72 *water be addressed?*

73 Monitoring results and reports must be provided to the Province as a condition of the
74 Licence. Sharing information with communities and/or concerns related to general
75 operation of the municipal wastewater treatment plant would take place at the
76 Monitoring Advisory Committee (MAC) meetings. Immediate concerns can also be
77 directed to the community's Future Development Office for immediate follow-up with
78 Manitoba Hydro.

1 **REFERENCE: Volume: N/A; Section: N/A; Page No.: N/A**

2 **CEC Rd 2 CFLGC-0025c**

3 **ORIGINAL PREAMBLE AND QUESTION (CFLGC-0013):**

4 On page 4-39, it is stated that "Filtered backwash from the water treatment plant
5 operations will be discharged to the Nelson River" This "effluent quality will meet or
6 exceed Manitoba's standards..." Please explain how:

7 10. the community was informed of this process and their responses to the effluence,
8 especially the Fishermen and Elders from FL

9 11. the data may exceed Manitoba's standards

10 12. the research was completed for alternative means of treating wastewater and fecal
11 matter for current and future projects

12 Ekosi.

13 **FOLLOW-UP QUESTION:**

14 Line 47-48: how will Manitoba Hydro deal with the ecosystem change with the resevoir
15 of standing water, ie, with the increase of insects?

16 **RESPONSE:**

17 The increase in insects will not affect the ability of the treatment plant to treat the
18 water.

1 **REFERENCE: Volume: N/A; Section: N/A; Page No.: N/A**

2 **CEC Rd 2 CFLGC-0025d**

3 **ORIGINAL PREAMBLE AND QUESTION (CFLGC-0013):**

4 On page 4-39, it is stated that "Filtered backwash from the water treatment plant
5 operations will be discharged to the Nelson River" This "effluent quality will meet or
6 exceed Manitoba's standards..." Please explain how:

- 7 4. the community was informed of this process and their responses to the effluence,
8 especially the Fishermen and Elders from FL
9 5. the data may exceed Manitoba's standards
10 6. the research was completed for alternative means of treating wastewater and fecal
11 matter for current and future projects

12 Ekosi.

13 **FOLLOW-UP QUESTION:**

14 Line 60-61- what will happen to the effluence if it is above 200? Also, what about
15 additional phosphates and products released into the water from camp laundry,
16 dishwashing, and other chemical products? How ill these be monitored?

17 **RESPONSE:**

18 The response assumes "200" is referring to Manitoba's Tier 1 Water Quality Standards
19 for fecal coliform content in effluent, as indicated by the MPN (most probable number)
20 index, of 200 per 100 millilitres of sample.

21 *Line 60-61 - what will happen to the effluence if it is above 200?*

22 The wastewater treatment plant will be operated so the effluent entering the Nelson
23 River meets or is of better quality than what is listed in both Manitoba's Tier 1 Water
24 Quality Standards and the Manitoba *Environment Act* Licence No. 2952 (The Licence),
25 which stipulates how the plant must be operated. Although not anticipated, if the
26 results from monitoring the effluent show that the fecal coliforms are greater than 200
27 per 100 millilitres of sample, the Province would be notified and the treatment issue
28 leading to the elevated result would be investigated and corrected.

29 *Also, what about additional phosphates and products released into the water from camp
30 laundry, dishwashing, and other chemical products?*

31 All wastewater from camp laundry, dishwashing, showers, toilets and other domestic
32 activities will be directed to the wastewater treatment plant. The plant will be designed

33 to remove phosphorus from the wastewater before discharging it to the Nelson River.
34 The final effluent will have a concentration of phosphorus no more than 1 mg/L).

35 *How will these be monitored?*

36 Samples of wastewater effluent will be collected from a monitoring station located after
37 the disinfection step in the wastewater treatment plant. Samples will be analysed in a
38 laboratory for both fecal coliforms and phosphorus. Details related to monitoring
39 effluent from the wastewater treatment plant are outlined in Schedule B to the Licence.

1 **REFERENCE: Volume: N/A; Section: N/A; Page No.: N/A**

2 **CEC Rd 2 CFLGC-0025e**

3 **ORIGINAL PREAMBLE AND QUESTION (CFLGC-0013):**

4 On page 4-39, it is stated that "Filtered backwash from the water treatment plant
5 operations will be discharged to the Nelson River" This "effluent quality will meet or
6 exceed Manitoba's standards..." Please explain how:

- 7 7. the community was informed of this process and their responses to the effluence,
8 especially the Fishermen and Elders from FL
- 9 8. the data may exceed Manitoba's standards
- 10 9. the research was completed for alternative means of treating wastewater and fecal
11 matter for current and future projects

12 Ekosi.

13 **FOLLOW-UP QUESTION:**

14 Line 81-88 – was biological waste water treatment explored? If so, please provide data
15 from the reports made by the consultants mentioned as to why such methods are not
16 used.

17 **RESPONSE:**

18 As indicated in CEC Rd 1 CFLGC-0013, wastewater lagoons and mechanical wastewater
19 treatment plants were alternative methods considered to treat wastewater during the
20 construction phase of the Project. Lagoons and treatment plants both include biological
21 processes to treat wastewater. Both methods rely on micro-organisms to break down
22 the organic components in the wastewater and remove most of these organic
23 components prior to discharging the final effluent to the Nelson River.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 6.8**
 2 **Effects and Mitigation Heritage Resources; Page No.: 6-561**

3 **CEC Rd 2 CFLGC-0026**

4 **ORIGINAL PREAMBLE AND QUESTION (CFLGC-0007):**

5 On Page 6-561, it is stated that: "the approach taken to interpreting the effects and
 6 extending the appropriate mitigation to heritage resources known and unknown was
 7 based on the results of archeological field investigations, ATK...on archeological sites".
 8 Please explain how intangible cultural heritage, as defined by UNESCO's Convention for
 9 the Safeguarding of Intangible Cultural Heritage, will be affected and mitigation
 10 measures taken to ensure their protection.

11 Ekosi.

12 **FOLLOW-UP QUESTION:**

13 How does Manitoba Hydro and future hydro projects impact Makeso Sakahican's
 14 intangible cultural heritage as it is discussed in their response? How does Manitoba
 15 Hydro intend to minimize the negative impacts on intangible cultural heritage in Makeso
 16 Sakahican? How will MH ensure that more than the tangible heritage that is evidenced
 17 through ceremonies at project milestones, are protected, such as relationship to the
 18 land.

19 Ekosi.

20 **RESPONSE:**

21 In response to the first question, "*How does Manitoba Hydro and future hydro projects*
 22 *impact Makeso Sakahican's intangible cultural heritage as it is discussed in their*
 23 *response?*", the KHP assessment of the Project effects on intangible heritage including
 24 future projects and activities, is addressed in Section 7.6.3.2 of the Response to EIS
 25 Guidelines.

26 The latter questions reference two aspects of heritage: tangible and intangible heritage.
 27 As noted in the original response to CEC Rd 1 CFLGC-0001, a range of measures has
 28 been developed to avoid or mitigate potential effects related to not only tangible
 29 heritage, but also intangible heritage, including memory recall, culture and spirituality,
 30 relationship with the land, and social cohesion. Notably, there are two types of
 31 ceremonies that are intended to honour the KHP's deep respect for the land and serve
 32 to protect heritage: 1) those associated with found tangible heritage resources during
 33 construction, and 2) Project milestones:

- 34 1. The Heritage Resources Protection Plan outlines the steps and protocols that occur
35 upon the discovery of tangible resources, including the implementation of culturally
36 appropriate ceremonies. While triggered by the discovery of tangible heritage
37 resources, these ceremonies also honour the KCNs' physical, spiritual and cultural
38 connection with the land since time immemorial.
- 39 2. Ceremonies associated with Project milestones are intended to mitigate effects on
40 KCNs culture and assist Members to deal with the physical, mental, emotional and
41 spiritual changes associated with the Project in areas traditionally used by them.
42 They will be designed and implemented by the contractor – in this case, a direct
43 negotiation contract with FLCN and YFFN.
- 44 Please refer to the response CEC Rd 1 CAC-108b, which describes measures associated
45 with memory recall, cultural and spirituality, relationship with the land and social
46 cohesion.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 6.4.2**
2 **Aboriginal Traditional Knowledge; Page No.: 6-239**

3 **CEC Rd 2 CFLGC-0027**

4 **ORIGINAL PREAMBLE AND QUESTION (CFLGC-0008):**

5 On Page 6-239, it is stated that: "the Keeyask dam is expected to negatively affect fish
6 populations by blocking fish movements...and causing spillway and turbine mortality".
7 Please provide us with the appropriate fish passage report on Keeyask and for BiPole 3
8 that helps portray this data. Ekosi.

9 **FOLLOW-UP QUESTION:**

10 Ln 66 -Why is there no fish passage report for BiPole 3? What about all the river and
11 streams that the line will go through, thus affecting the aquatic life in these streams?
12 We would like an aquatics report for BiPole 3 with all the information pertaining
13 bridges, access roads and construction sites that will cross through streams of the
14 project area.

15 Ekosi.

16 **RESPONSE:**

17 As stated in the response to CEC Rd 1 CFLGC-0008, there was no fish passage report
18 created for the Bipole III Transmission Project because the construction and operation
19 of the project does not affect fish passage.

20 The aquatics information developed as part of assessing the Bipole III Project is included
21 in the environmental assessment filings associated with that project. These reports can
22 be found on Manitoba Hydro's Web site at:

23 <http://www.hydro.mb.ca/projects/bipoleIII/>.

1 **REFERENCE: Volume: N/A; Section: N/A; Page No.: N/A**

2 **CEC Rd 2 CFLGC-0028**

3 **ORIGINAL PREAMBLE AND QUESTION (CFLGC-0002, CFLGC-0010**
4 **and CFLGC-0017):**

5 **CFLGC-0002**

6 On page 1-10 of the EIS, it is stated that "KCNs have led their evaluations of the effects
7 of the Project on their communities and Members, they have also collaborated in the
8 preparation of this EIS". However, on p. 2-39, it is stated that the "Fox Lake Traditional
9 Knowledge program emerged at a later stage of the environmental assessment
10 process".

11 Please provide an explanation to:

- 12 1. the contradiction on how the data was compiled to make up the EIS - especially
13 since the TK data was documented at later stages.
- 14 2. provide examples how Fox Lake was collaborating on the writing of the EIS, the
15 chapter components found within and the components of the "Cree world view"
16 that are embedded in the EIS but not credited to any First Nation members
17 specifically.

18 Ekosi.

19 **CFLGC-0010**

20 In this section, there is mention of the report entitled: "The Forgotten Nation in the
21 Shadows of the Dams" (1997). We would like a copy of this report.

22 Ekosi.

23 **CFLGC-0017**

24 On page 6-426, it is stated that adverse social economic effects have been identified.
25 We would like more information on the discussions about these effects, so please
26 provide us with all the reports and studies completed or not-yet-completed by Rachel
27 Eni.

28 Ekosi.

29 **FOLLOW-UP QUESTION:**

30 Ln 17-19: Since we are a group composed of Makeso Sakahican Elders, and since
31 individuals like Rachel Eni were contracted by Fox Lake Negotiations Office, members of

32 Makeso Sakahican who were and continue to be covered by these studies, can certainly
33 ask for thee reports at the Gillam or Winnipeg Offices.

34 Kindly inform the offices that we will be asking for these reports, and that we would like
35 to have them ready for pick up in August.

36 Ekosi.

37 **RESPONSE:**

38 As noted in the responses to CEC Rd 1 CFLGC-0003 and CFLGC-0009, draft versions of
39 *Ninan*, the Community History video and ATK reports prepared by the community as
40 part of the Keeyask process are referenced in the EIS filing and are available to Fox Lake
41 Cree Nation members, upon request, at the Fox Lake Cree Nation Negotiation Office in
42 Winnipeg and Gillam.

43 As noted in the response to CEC Rd 1 CFLGC-0017, no work undertaken by Rachel Eni is
44 cited in any of the EIS filings, including the FLCN Environment Evaluation Report. Rachel
45 Eni was previously on contract with the Fox Lake Cree Nation Negotiation Office. The
46 work undertaken by Rachel Eni as part of this contract is considered confidential by Fox
47 Lake Cree Nation and will not be made available.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section:**
 2 **Executive Summary; Page No.: 21, 36, 38**

3 **CEC Rd 2 CFLGC-0029**

4 **ORIGINAL PREAMBLE AND QUESTION (CFLGC-0015):**

5 The EIs and the executive summary defines the Valued Environmental Components
 6 (VECs) as on the basis of cultural ideals or scientific concern. Please provide for us how
 7 the proponents of the Keeyask place intangible cultural heritage as defined by UNESCO's
 8 Convention for the Safeguarding of Intangible Cultural Heritage, in this understanding of
 9 cultural ideals and scientific concern.

10 Ekosi.

11 **FOLLOW-UP QUESTION:**

12 Keeping in mind that the experiences and histories of each of the Cree First Nations are
 13 unique, please explain what is meant by a "collective expression of intangible heritage",
 14 and how this "collective expression of KCN worldview" was written?". How did
 15 Manitoba Hydro enable the communities to get together and discuss their collective
 16 expressions? Was any funding provided by MH?

17 **RESPONSE:**

18 The phrase "collective expression of intangible heritage" refers to the collection of
 19 statements prepared by Elders, KCN Members and leadership of the KCNs that are
 20 intended to provide guidance for the Keeyask Generation Project and reflect shared
 21 ideas about how "the Ininewak (the Cree people) live and what is true about Askiy (the
 22 living earth and all within and upon it)" (see Section 2.2.1, Response to EIS Guidelines).
 23 The KHLP agrees that the experiences and histories of the four Cree Nations are unique.
 24 Section 2.2.1 (Ininewak Askiy Kasikannowapachikatek - How the Ininewak Live and What
 25 is True About Askiy) explains, "the following statements are not a complete description
 26 of who we are, how we live and what is true to us, and there are differences between
 27 and amongst our communities and our individual members. However, we share the
 28 following statements regarding who we are, how we live and what is true to us." The
 29 statements can be found on pgs 2-7. See Appendix 2B in the Response to EIS Guidelines
 30 for a syllabic interpretation of the Cree worldview.

31 This consensus statement was prepared through of series of 3 workshops over the
 32 course of about six months with Elders and the KCNs community representatives. This
 33 process was planned and undertaken by the KCNs. The group determined where and
 34 how it would meet.

35 These workshops contributed to the development of Chapter Two in the EIS, as noted
36 earlier. As such, and as per the JKDA, funding was provided by Manitoba Hydro (on
37 behalf of the KHLP) to each of the KCNs for this activity (including costs associated with
38 travel and accommodation) as it is specifically linked to the Keeyask Generation Project.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: N/A;**
2 **Page No.: N/A**

3 **CEC Rd 2 CFLGC-0030**

4 **ORIGINAL PREAMBLE AND QUESTION (CFLGC-0020a-f):**

5 Please provide us with a copy of poster-sized maps of:

- 6 1. Gillam area prior to any Manitoba Hydro development and any flooding
- 7 2. Gillam area after Kettle dam and Stephen's Lake
- 8 3. Nelson River after Long Spruce
- 9 4. Nelson River after Limestone
- 10 5. predictions of the submersions and flooding that was to occur after the construction
- 11 of Kettle Dam in Gillam
- 12 6. predictions of the submersions and flooding that was to occur after the construction
- 13 of Limestone
- 14 7. predictions of the submersions and flooding that was to occur after the construction
- 15 of Long Spruce

16 Ekosi

17 **FOLLOW-UP QUESTION:**

18 Line 13- The "actual" levels (of 220.66km² & 13.76 for example) are very outdated
19 (1990) Please provide us with more recent data.

20 Ekosi.

21 **RESPONSE:**

22 The flooded areas referenced in the responses to CEC Rd 1 CFLGC-0020e, CFLGC-0020f
23 and CFLGC-0020g are the most current values used by Manitoba Hydro.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 6.6;**
2 **Page No.: N/A**

3 **CEC Rd 2 CFLGC-0031**

4 **ORIGINAL PREAMBLE AND QUESTION (CFLGC-0021):**

5 Original Question: Section 6.6 describes the numerous benefits and employment
6 opportunities that are available to First Nations.

- 7 1. Please provide us with a list of investments and business opportunities that will be
8 created for the First Nations and those which will be assisting First Nations develop
9 their own business opportunities.
- 10 2. How will challenges discussed on page 6-434 be resolved?
- 11 3. How will the percentage of the Aboriginal workforce be increased from the low
12 numbers that are predicted to be in Keeyask on page 6-432?
- 13 4. Please explain why community enhancement through investments and training in
14 leadership, governance, law and engineering are not part of Manitoba Hydro's
15 mandates towards community members.

16 **FOLLOW-UP QUESTION:**

17 Line 70. What is meant by "absolute amount of employment"? In regards to the
18 preferential hiring of Aboriginal residents - please write what positions do Aboriginal
19 residents currently hold at Manitoba Hydro in Gillam?

20 Line 149-150 – How many of the 12 in 2013 and 8 individuals in 2012 were from Fox
21 Lake?

22 Ekosi.

23 **RESPONSE:**

24 Each of the above is answered in turn.

25 *What is meant by "absolute amount of employment"?*

26 Absolute amount of employment is the number of jobs filled. In the response provided
27 in CEC Rd 1 CFLGC-0021, it refers to the number of jobs filled by KCNs.

28 *In regards to the preferential hiring of Aboriginal residents - please write what positions
29 do Aboriginal residents currently hold at Manitoba Hydro in Gillam?*

30 The list below shows a range of positions held by Aboriginal employees in Gillam (there
31 are 48 classifications in total). A total of 134 Aboriginal employees hold these positions;

32 there is more than one job holder in some of these classifications. Please note that the
33 list includes everyone who "declared" themselves as Aboriginal in the Workforce
34 Demographics Census with a Gillam headquarter zone:

- 35 • COOK
- 36 • ELECTRICAL TECHNICIAN SENIOR
- 37 • ELECTRICIAN JOURNEYMAN
- 38 • FLEET MECHANIC JOURNEYMAN
- 39 • FLEET TECHNICIAN
- 40 • HIGH PRESSURE WELDER
- 41 • MECHANICAL TECHNICIAN SENIOR
- 42 • OPERATING/ELECTRIC TECHNICIAN TRAINEE
- 43 • OPERATING/ELECTRICAL TECH JOURNEYMAN
- 44 • OPERATING/ELECTRICAL TECHNICIAN
- 45 • OPERATING/MECHANICAL TECH TRAINEE
- 46 • OPERATING/MECHANICAL TECHNICIAN
- 47 • OPERATING/MECHANICAL TECHNICIAN SR
- 48 • OPERATOR DRIVER
- 49 • PAINTER (NON-CERTIFIED)
- 50 • PAINTER JOURNEYMAN
- 51 • PLUMBER JOURNEYMAN
- 52 • PRE-PLACEMENT TRAINEE
- 53 • PROTECTION JOURNEYMAN
- 54 • STOREKEEPER
- 55 • TELECONTROL JOURNEYMAN
- 56 • TRADES TRAINEE
- 57 • UTILITYWORKER
- 58 • SUPERVISOR III
- 59 • STAFF OFFICER

60 *How many of the 12 in 2013 and 8 individuals in 2012 were from Fox Lake?*

- 61 • 2013: 9 of the 12 students are from Fox Lake Cree Nation.
- 62 • 2012: 3 of the 8 students were from Fox Lake Cree Nation.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: N/A;**
2 **Page No.: N/A**

3 **CEC Rd 2 CFLGC-0032**

4 **ORIGINAL PREAMBLE AND QUESTION (CFLGC-0019):**

5 In the updated Keeyask Traffic Assessment, it is stated: "the updated traffic analysis
6 examines the effects of construction traffic on public roads (PR 280 and PR 391). It does
7 not include traffic effects on private roads or traffic experienced during the operation
8 phase. As a result, the north and south access roads, which will be private during
9 construction, have not been considered in this analysis" (page i)

10 Please answer the following questions:

- 11 1. if the North and South Access Roads will be private during construction only, will
12 they become public/provincial highways after construction is complete?
13 2. if so, when will that be?
14 3. if so, please provide us with
15 a. a traffic report that discusses public involvement; terrestrial & aquatic &
16 social/heritage effects
17 b. monitoring during and post construction
18 c. access to the road by MH workers as well as Fox Lake community members
19 d. any and all compensation/access agreements of the trappers/resource users
20 of all the areas that the North and South Access Roads will go through
21 4. Will the pr280 be decommissioned?
22 5. if so, please provide what "decommissioning" means and what it entails.
23 6. f so, will all concrete, pipes and man-made material be removed and will soil & trees
24 be re-planted (ie. Will the area be rehabilitated?)
25 7. Please provide us with any benefits that exists for the Fox Lake community
26 members to have the SAR.
27 8. Please explain how the First Nations and especially Fox Lake participated in the
28 initiation, design and monitoring of the SAR and NAR.

29 **FOLLOW-UP QUESTION:**

30 Ln 85- the questions have not been answered. Since MH is promoting these roads
31 primarily for hydro development, will they be working with MIT to decommission the
32 NAR to pre-road (or almost) conditions?

33 What environmental and social impacts does Manitoba Hydro foresee with BOTH roads
34 in operation? (since one may be closed at a later date, until then, what effects are
35 predicted?)

36 Ekosi.

37 **RESPONSE:**

38 This question will be answered in two parts.

39 *Since MH is promoting these roads primarily for hydro development, will they be working*
40 *with MIT to decommission the NAR to pre-road (or almost) conditions?*

41 In the response to CEC Rd 1 CFLGC-0019 it was stated that MIT has indicated that it will
42 take ownership of the new north and south access roads and declare the alignment as
43 Provincial Road (PR) 280. The declared provincial road status of the Km 174 to PR 290
44 section of the existing PR 280 will be legally removed and all associated provincial road
45 route number signing will be taken down. Once the declared status has been removed,
46 the north eastern section of existing PR 280 (Km 174 to PR 290) will remain open (both
47 legally and physically) as it automatically becomes a departmental road under the
48 jurisdiction of MIT, given that the road is located in an unorganized territory. Further
49 decisions with regard to the future of the road will involve a thorough analysis and
50 assessment by MIT to determine if on-going public usage and/or access are still required
51 on the proposed abandoned section of PR 280 (Km 174 to PR 290). All decisions with
52 regard to the eventual fate of the Km 174 to PR 290 section of PR 280 will be made by
53 MIT following the legal realignment of PR 280.

54 *2) What environmental and social impacts does Manitoba Hydro foresee with BOTH*
55 *roads in operation? (since one may be closed at a later date, until then, what effects are*
56 *predicted?)*

57 As access during construction will be controlled by the Keeyask Construction Access
58 Management Plan (AMP), it is assumed that the second part of the question refers to
59 the potential effects of both roads being open during the operation phase of the
60 Project.

61 The presence and the public nature of both the newly aligned PR 280 and the
62 'abandoned' (but still open) Km 174 to PR 290 section of the existing PR 280 will provide
63 increased access in the Local Study Area. Travel distance between Thompson and
64 Gillam will be reduced by approximately 53 kms. Travel time is reduced by
65 approximately 45 minutes (as per legal speed limit on the new PR280 route). The
66 presence of this route is expected to change travel patterns in the Gillam area, resulting
67 in an ongoing benefit to Gillam area residents, including FLCN Members who reside in
68 Gillam. While both roads remain open, those traveling to Bird from the west will have
69 the choice to use either the MIT departmental road from Km 174 to PR 290 or the new
70 PR 280 alignment. The re-routed sections of PR 280 will also be new and in better

71 condition than the existing PR 280 around the north side of Stephens Lake, which will
72 benefit all road travelers, including FLCN Members.

73 Domestic KCNs harvesters currently using the north and south access road areas that
74 may be negatively affected by the increased access will have access to AEA offsetting
75 programs. As discussed in Section 6.7.4.1.3 of the Resource Use section of the Response
76 to EIS Guidelines, it is expected that agreements will be in place to compensate
77 commercial trappers for disturbances associated with access roads during operation.

78 The environmental effects of operating both roads during the operation phase of the
79 Project were considered in all components of the terrestrial environmental effects
80 assessment (see specifically Chapter 6, Section 6.5 Effects and Mitigation Terrestrial
81 Environment). Please also see the response to CEC Rd 1 CEC-0009.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: C. 6, C.**
2 **7-3 and 7-45; p. 425, 426, 488**

3 **CEC Rd 2 CAC-0111**

4 **ORIGINAL PREAMBLE AND QUESTION (CAC-0075a):**

5 The project identified valued environmental components (VECs) and then analyzed the
6 adverse residual affects of the project on the VECs, taking into consideration mitigation
7 efforts. Then they determined the significance of the adverse effects based on guidance
8 from regulatory authorities which the project admitted differs from Cree World Views.
9 (C. 7-3)

10 How would the results vary if a Cree World View was used as the benchmark?

11 **FOLLOW-UP QUESTION:**

12 The Project was evaluated by each of the KCNs in terms of their own worldview, values
13 and experience with past hydroelectric development, as well as their relationships with
14 Mother Earth (see Chapter 2 and the KCNs' Environmental Evaluation Reports which
15 were provided to assist others in understanding their independent decisions to be
16 Project proponents). (lines 21 through 26, emphasis added) In Chapter 2.4.7, the
17 Partnership describes how referendum were implemented and a majority of
18 participants supported joining the project.

- 19 · Does a referendum imply local worldview, values and experiences were integrated
20 into decision making? In other words, is a referendum able to encompass these
21 features, or is it a Western system that assigns equal weight to each individual and
22 find that majority support is the test? Please explain.

23 **RESPONSE:**

24 A referendum is a Western voting system which assigns equal weight to each voter in
25 order to reach a majority decision on a specific issue. Inherent in any individual's
26 decision, such as a vote with a secret ballot, are a variety of influences, including
27 worldview, values, and experience. In the case of the KCNs, each community's
28 referendum was a way of expressing the decision of the majority who voted after over a
29 decade of meaningful engagement related to the Keeyask Generation Project.

30 See also CEC Rd 2 CAC-0112.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 7-3 and**
 2 **7-45; Page No.: N/A**

3 **CEC Rd 2 CAC-0112**

4 **ORIGINAL PREAMBLE AND QUESTION (CAC-0075b):**

5 The project has identified socio-economic cumulative affects and concluded that this
 6 project will not worsen them. (C.7-45)

7 Given that these cumulative affects have been very troublesome, is it sufficient to not
 8 create more damage to justify the project? What ethical principle is being used to make
 9 this decision, e.g. Pareto optimality?

10 **FOLLOW-UP QUESTION:**

11 To paraphrase, the question was, given the troublesome impacts on FN communities
 12 from hydro dams in the past, what ethical criteria was used to make the difficult
 13 decision about the Keeyask project? In its response, the Partnership indicates that:
 14 KCNs Members interviewed in the video are explicit that, while the decision in weighing
 15 potential adverse effects against the potential benefits was a difficult one, the decision
 16 to support the Project was based on a belief that the future will be better with the
 17 Project than without – that there will be a benefit to future generations. (emphasis
 18 added)

19 Acknowledging the referendum results, what if any mechanisms does the Partnership
 20 have in place to evaluate the will of the communities as the project proceeds? What if
 21 any mechanisms does the Partnership have in place to respond to the possibility that
 22 the percentage of those opposed to the project will surpass the percentage in favour as
 23 the project moves from plan through construction to operations?

24 Acknowledging the referendum results, does the Partnership accept that if the negative
 25 effects are larger than expected and the local positive impacts are much weaker than
 26 expected, the analytic basis on which the project went ahead would then shatter?

27 Recognizing the risks that the current level of support may diminish, that the negative
 28 impacts are much larger than expected and that the positive impacts are much weaker,
 29 what risk matrix or ethical framework did the KCN communities employ to determine
 30 that the benefits of going ahead outweighed the risks?

31 **RESPONSE:**

32 Each KCN is a self-governing community. As part of the JKDA negotiations, the KCNs and
 33 Hydro agreed to a Ratification Protocol and Referendum Rules to be followed on a best

34 efforts basis by each of the communities. Each KCN consulted its members throughout
35 the planning of the Keeyask Project, the details of which are set out in the second
36 chapter of the Response to EIS Guidelines and in the Environmental Evaluation Reports
37 filed by the KCN, and in accordance with the referendum process in the JKDA. Similarly,
38 the Partnership has no intention of trying to evaluate in the future “the will” of the
39 members of any KCN. As Final Closing approaches, each KCN will have the opportunity,
40 if the “will” of its members so dictates, to elect not to proceed as a partner in the
41 Project or to have its investment in Common Units treated as Preferred Units, if a
42 majority of its members support a less risky investment. If, over the years, a majority of
43 members of one or more of the KCN no longer wish their First Nation to be a partner,
44 one would expect that the KCN Investment Entity holding that First Nation’s investment
45 in the Partnership would seek to withdraw as a partner and dispose of the investment.
46 Alternatively, one would expect that whatever circumstance or issue motivates a
47 majority to “oppose” the Project will become the subject of discussion and negotiation
48 between the Partners with a view to seeking a resolution that satisfies the concerns of
49 the majority in question. (See the response to CEC Rd 2 CAC-00124 for a description of
50 the various dispute resolution processes in the JKDA.)

51 The Keeyask Project is proceeding on the basis that it will benefit future generations
52 through a long-term revenue stream and other benefits including employment, training
53 and business opportunities. Today, one can only estimate the expected extent of these
54 benefits and there is certainly the possibility that they may be less than currently
55 anticipated. The Partnership has consistently been cautious in its estimates and
56 presented a range of possibilities to demonstrate the predictive nature of future
57 benefits and the range of possible outcomes. In the final result, a primary objective of
58 the Keeyask Project was to involve the KCNs in the decision making processes, including
59 the design of the Project and the form through which it would be owned and managed.
60 Initial decisions have now been made and whether, unlikely as it is, the Project
61 ultimately over its lifetime does not meet initial expectations, the KCN have benefited
62 from the experience of jointly participating in decision making and planning and, for the
63 first time for the KCN, from being able to be proactive in a hydro-electric development.
64 Accordingly, the Partnership does not agree that the basis upon which the Project was
65 planned and analyzed would “shatter”. The Partnership believes that the processes it
66 has followed to plan and analyze the Project were sound; they do not guarantee that all
67 benefits will meet present expectations; they do not guarantee that all predictions will
68 be exactly fulfilled; however, the Partnership is confident that even with the benefit of
69 the perfect vision that hindsight brings, the basis upon which it planned and analyzed
70 the Project will still be found to have been sound.

71 Risk matrices are a tool used in some circumstances in analyzing decisions a business
72 must take or, perhaps, a government department. Voters, be they Aboriginal or non-

73 Aboriginal, rely on their personal experiences and personal beliefs and principles when
74 called upon to vote. Central to the Cree culture, described in Chapter 2 of the Response
75 to EIS Guidelines, is the obligation to respect and care for all parts of the land and water.
76 Each member of each KCN who participated in the referendums necessarily had to
77 weigh in her or his mind whether the Project would provide to her or his people enough
78 return through revenues, jobs and education so as to help, in future years, in the task of
79 caring for the lands and waters and people who depend upon them while at the same
80 time preserving sufficient harmony and balance in the ecosystem. Given the
81 referendum results, one can conclude that a majority of those who participated believe
82 that it is possible to build and operate the Keeyask Generating Station such that
83 harmony and balance can be preserved while drawing from the lands and waters, albeit
84 in a different way, enough 'sustenance' to live good and honourable lives.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 6.6.3.1**
 2 **employment, 6.6.3.1.1 construction, 6.6.3.2, business**
 3 **opportunities, 6.6.3.3, income; Page No.: N/A**

4 **CEC Rd 2 CAC-0113**

5 **ORIGINAL PREAMBLE AND QUESTION (CAC-0076a):**

6 Sections 6.6 addresses a variety of subjects including economy, employment, business
 7 opportunities and income. While some details are provided further information is
 8 desirable. Please provide additional details on the following subject matters:

- 9 · How will higher waged/higher skilled jobs be created for Keeyask members? · How
 10 will Keeyask Cree Nations (KCN) residents gain skills to take on these jobs?

11 **FOLLOW-UP QUESTION:**

12 The response is helpful but I am still not clear on the likely impact regarding
 13 construction employment.

- 14 · Given that KCN workers will be competing with workers from the South with more
 15 skills and experience is it likely that they will gain higher waged and higher skilled
 16 jobs in the construction phase?
 17 · If the answer to the question above is yes, please provide any evidence from past
 18 Hydro projects or from the literature to justify your expectation that KCN workers
 19 will be likely to gain higher waged and higher skilled jobs in the construction phase.

20 **RESPONSE:**

21 Section 3.4.1.2 of the SE SV includes both high and low estimates of construction
 22 employment of KCN workers in 4 skill categories – construction support, non-
 23 designated trades, designated trades and MH and supervisory. These estimates indicate
 24 that it is likely that some KCN workers will participate in the higher skilled job
 25 categories, as set out on pages 3-95 and 3-96. The estimates are conservative, based in
 26 part on experience from the construction phase of the Wuskwatim Generation Project.
 27 As described in CEC Rd 1 CAC-0076a, KCN Members will have access to construction
 28 jobs through direct hiring on direct negotiation contracts and through preference
 29 provisions for qualified Aboriginal workers within the Churchill Burntwood Nelson (CBN)
 30 area, as set out in the Burntwood-Nelson Agreement.

31 Information on employment at Wuskwatim, by job classification, is provided in the
 32 Wuskwatim Annual Monitoring Overview Reports published on the Wuskwatim Power
 33 Limited Partnership's website at: www.wuskwatim.ca. This information is categorized by
 34 total hires, Aboriginal hires, and non-Aboriginal hires.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 6.6.3.1**
2 **employment, 6.6.3.1.1 construction, 6.6.3.2, business**
3 **opportunities, 6.6.3.3, income; Page No.: N/A**

4 **CEC Rd 2 CAC-0114**

5 **ORIGINAL PREAMBLE AND QUESTION (CAC-0076b):**

6 6.6. addresses a variety of subjects including economy, employment, business
7 opportunities and income. While some details are provided further information

8 How will KCN residents get training and education needed to get other permanent jobs?

9 **FOLLOW-UP QUESTION:**

10 Thank-you for the response. Once again you describe a plan for training and education.
11 Please provide any evidence from past Hydro projects or from the literature to justify
12 your expectation that the plan for training and education works with FN communities?

13 **RESPONSE:**

14 The following provides a brief overview of the outcomes of several training and
15 education initiatives described in the original round one response.

16 Since 1998, Manitoba Hydro has run a very successful, nationally recognized pre-trades
17 training program specifically for Aboriginal candidates entering the trades. The
18 Aboriginal Pre-Placement Program is designed to provide Aboriginal candidates with the
19 academic prerequisites and on the job experience to enter into the Hydro trades. Over
20 the past 14 years, 366 candidates have participated in one of the three streams of the
21 program (Northern, Southern and Powerline Technician); 289 continued their
22 employment with Hydro. The numbers of retained staff who have graduated from the
23 APP and the longevity of the program is an indicator of its success.

24 Of Hydro's current workforce, 17.9% is Aboriginal based on self-declarations, which
25 equates to nearly 1200 employees. This is a substantial increase from the approximately
26 400 Aboriginal employees in 2000, and the Aboriginal Pre-Placement Program is a major
27 contributor to the success of Aboriginal employment at Manitoba Hydro. The
28 relationship-building and dedicated recruitment efforts in Aboriginal communities are
29 another reason Hydro has been successful in recruiting and retaining Aboriginal
30 employees over the long term.

31 Through the Joint Keeyask Development Agreement Employment Framework, Manitoba
32 Hydro staff are working closely with the KCNs in an effort to recruit community
33 members for employment within Manitoba Hydro operations. Activities such as career

34 fairs, school presentations, individual career counseling, hands-on skills demonstrations
35 and educational funding opportunities take place throughout the year. While KCNs
36 Members were employed with Manitoba Hydro prior to 2009, current data show that 14
37 KCNs Members have been hired into Hydro operations since the Agreement was signed
38 in 2009.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 6.6.3.1**
 2 **employment, 6.6.3.1.1 construction, 6.6.3.2, business**
 3 **opportunities, 6.6.3.3, income; Page No.: N/A**

4 **CEC Rd 2 CAC-0115**

5 **ORIGINAL PREAMBLE AND QUESTION (CAC-0076c):**

6 Sections 6.6 addresses a variety of subjects including economy, employment, business
 7 opportunities and income. While some details are provided further information is
 8 desirable. Please provide additional details on the following subject matters:

- 9 • How many permanent positions in Keeyask operations will be taken on by KCN
 10 residents?

11 **FOLLOW-UP QUESTION:**

12 The question posed sought to determine how many permanent positions in Keeyask
 13 operations will be taken on by KCN residents? The Partnership's response indicated that
 14 it is reasonable to anticipate that some Keeyask Generation operation and maintenance
 15 jobs will be filled by KCNs Members. No estimate of this number was provided in the EIS
 16 as the 182 permanent positions in the JKDA for KCNs Members on Manitoba Hydro
 17 operation and maintenance jobs extend across Manitoba Hydro's system and are not
 18 confined to the Keeyask Project. Furthermore, it is not feasible to ascertain the exact
 19 number of Keeyask positions to be filled by KCNs Members as this number is dependent
 20 upon a variety of factors such as career aspirations, readiness and job opportunities.
 21 However, it is arguable that a mutual advantage might inure in that the KCN worker
 22 would know his/her community and environment very well which would benefit the
 23 project. Working in the locale would assist the KCN community as the worker would be
 24 more likely to be linked into the local economy. Local employment would reduce the
 25 'brain drain' effect where the best workers leave the community which reduces the
 26 community's capacity. Given the potential for mutual advantage, why is a target not
 27 set?

28 **RESPONSE:**

29 The KHLP completely agrees that maximizing local employment opportunities and
 30 acquisition of such positions, both in construction and operations by local community
 31 members, builds local capacity and is part of the picture to generate sustainable
 32 economic development in the area (and thereby could contribute to reduce the 'brain
 33 drain'). A Keeyask specific target was not set for the reasons stated in our round one
 34 response and noted above in the information request.

35 It is important to note that the 182 permanent positions in the JKDA for KCNs Members
36 was negotiated between Manitoba Hydro and the KCNs, who did not want specific
37 targets set for Keeyask. The KCNs want their Members to have the opportunity to access
38 operational employment throughout the Manitoba Hydro system. Since operational
39 employment at Keeyask represents only a small subset of potential careers at Manitoba
40 Hydro.

41 In setting the 182 target, the KHLP factored in long-term operations requirements,
42 retirements, timing and local capacity in each community to fill available positions.
43 Given the challenges in ascertaining the exact number of Keeyask positions potentially
44 secured by KCNs (noted above), the absence of Project or site-specific targets is
45 intended to promote options and afford KCNs the opportunity to apply for positions as
46 they emerge. This is expected to result in more KCNs members securing permanent
47 employment in the career of their choice. Efforts to assist KCNs to secure employment
48 are outlined in CEC Rd 1 CFLGC-0021 and CEC Rd 1 CAC-0088d.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 6.6.3.1**
 2 **employment, 6.6.3.1.1 construction, 6.6.3.2, business**
 3 **opportunities, 6.6.3.3, income; Page No.: N/A**

4 **CEC Rd 2 CAC-0116**

5 **ORIGINAL PREAMBLE AND QUESTION (CAC-0076d):**

6 Sections 6.6. addresses a variety of subjects including economy, employment, business
 7 opportunities and income. While some details are provided further information.

8 In the longer term, 182 jobs for KCN residents will be created for Manitoba Hydro
 9 employment. Why 182 jobs as compared to some other figure? What if any implications
 10 does the employment of these members have on internal community capacity? Please
 11 discuss the suggestion that this might create a 'brain drain' on the KCN communities by
 12 encouraging these better trained employees to leave their community and move on to
 13 more lucrative opportunities elsewhere?

14 **FOLLOW-UP QUESTION:**

15 Line 21 refers to working groups made up of KCN members and Manitoba Hydro staff
 16 seeking ways to integrate 182 KCN workers into Manitoba Hydro operations.

- 17 · Please provide more detail about how the working groups will achieve the 182 job
 18 target.
- 19 · Also, at what point in time will the 182 be put in place: at the beginning of the 20
 20 year period? At the end of the period?

21 **RESPONSE:**

22 As part of the Joint Keeyask Development Agreement (JKDA), each Keeyask Cree Nation
 23 has at least one full-time community employee dedicated to carrying out the activities
 24 of the Working Group. Manitoba Hydro also has one full time employee dedicated to
 25 working with each of the communities. In the first three years of the agreement, these
 26 working group employees, along with Manitoba Hydro representatives, met monthly to
 27 participate in action planning meetings to identify the description, process, target
 28 audience, deliverables, measures of success and outcomes for each action outlined in
 29 the Employment Framework (JKDA Schedule 12-8). These documents lay the foundation
 30 for implementing the Employment Framework and are referenced by Working Group
 31 employees to assist them in planning activities in their communities.

32 On an annual basis, each community prepares a budget and schedule of activities to be
 33 undertaken in their respective communities (which reflects the distinct needs of each
 34 community). These activities are aimed to provide skills and knowledge people will need

35 to make decisions about careers with Manitoba Hydro. A number of activities and
36 events are jointly undertaken (community & Manitoba Hydro representatives) on -and
37 off-reserve such as, for example, school visits, Manitoba Hydro facility tours, skill
38 exploration workshops, hands-on sessions, life skills training, test taking workshops,
39 resume building and interview workshops. Meetings are also held with post-secondary
40 students to promote Manitoba Hydro scholarships and bursaries and to explain its
41 summer student program.

42 In addition to Manitoba Hydro's dedicated resources, many other Hydro employees
43 participate in working group activities through presentations, hands-on sessions in the
44 communities, facility tours and day-to-day administration. Manitoba Hydro has provided
45 training to working group employees in the areas of resume preparation, mock
46 interviewing, e-recruitment, how to conduct test workshops and career presentations.
47 "Train-the-trainer" techniques are used when delivering these topics to working group
48 employees so they can deliver these presentations and workshops to their members on
49 and off reserve.

50 The activities of the working group are aimed at different segments of each community,
51 from youth in elementary school (general awareness presentations) to teens in high
52 school (career presentations and facility tours) to post secondary students
53 (presentations on scholarships and bursaries and summer employment) to mature
54 students (hands on sessions, education upgrading opportunities). The aim is to provide
55 the information and assistance required by each of these segments so they can make
56 optimal career decisions regarding employment with Manitoba Hydro. All of these
57 activities are undertaken to achieve the 182 permanent job target.

58 It is expected that the 182 permanent jobs will be filled throughout the 20 year time
59 frame. All external job postings are provided to community working group employees
60 for posting and promotion within each community. These working group employees can
61 refer candidates directly to Manitoba Hydro's Recruitment & Diversity Department and
62 assist applicants in applying on-line.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: C.6.6,**
 2 **Chapter 9-9; Page No.: N/A**

3 **CEC Rd 2 CAC-0117**

4 **ORIGINAL PREAMBLE AND QUESTION (CAC-0077a):**

5 Sections 6.6 addresses a variety of subjects including economy, employment and
 6 training opportunities and business development opportunities. In Chapter 9, Manitoba
 7 Hydro indicates that “the project is designed to . . . maximize economic and social
 8 benefits for the community.” Additional information is requested on the following
 9 matters:

- 10 · How is it ensured that the KCN will get the lucrative contracts that are to be publicly
 11 tendered? Regarding the KCN businesses that are established during the
 12 construction phase, what will be done to ensure that they are sustainable into the
 13 future?

14 **FOLLOW-UP QUESTION:**

- 15 · Please share contract codes to be publicly tendered.
 16 · Also, line 31 makes reference to joint ventures between KCN businesses and non-
 17 KCN businesses. Please describe the non-KCN businesses: are they from the South?
 18 Are they large construction companies? Where are they based? How can it be
 19 assured that the KCN businesses benefit, and are not sidelined through the joint
 20 ventures? Please provide any evidence from past projects or the literature that joint
 21 ventures can work effectively for the FN community business?

22 **RESPONSE:**

23 The codes listed in Table 3-24 of the original response refer to type of work available to
 24 the KCNs’ through Direct Negotiation Contracts. They mean: SC – Service Contracts; IC
 25 – Infrastructure Contracts; PS – Principal Structures Contracts. These were used for the
 26 purposes of the JKDA only and are not relevant for publicly tendered contracts.

27 The KCNs’ joint ventures that include non-KCNs businesses represent the construction,
 28 food services, housekeeping, maintenance, security and emergency medical services
 29 industry. These businesses are based in areas other than Northern Manitoba (Winnipeg
 30 and Ontario) although have experience in Northern Manitoba and other northern
 31 regions in Canada.

32 Prior to the award of a DNC contract, as detailed under Schedule 13-2 of the JKDA –
 33 Proposal Review Process, all Proponents, including a joint venture company undergo an
 34 extensive review of their business model to ensure:

- 35 · it is a qualifying business, part of which requires at least 50% ownership by the KCN
36 business;
- 37 · it has appropriate financial capacity to run the business;
- 38 · it has the capacity to perform the work;
- 39 · it has a business plan that outlines approach and activities;
- 40 · it has identified capacity building for the appropriate Aboriginal partner that
41 includes details about the business enhancement and how it will strengthen its
42 capacity and/or skills to operate in a competitive market; and evidence that the
43 proposed business arrangement is not simply a flow-through of profit to a KCN
44 business.

45 After the award of a DNC to a joint venture company there is no guarantee that the
46 successful contracting party will earn a profit or will earn the profit it has estimated.
47 How a KCN business spends the profits is confidential to the contracting party and how
48 the KCN business manages the execution of the agreed terms of the joint venture
49 agreement is not compellable by Manitoba Hydro. No documented evidence from past
50 projects or literature about the effectiveness of a joint venture for the FN
51 community/business is available. The fact that KCN businesses continue to engage in
52 joint venture agreements and continue to advocate for the expansion of contracts that
53 can be negotiated directly with them persuades Manitoba Hydro that the joint venture
54 agreements work effectively for KCN's businesses.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 6.6, 9.9;**
 2 **Page No.: N/A**

3 **CEC Rd 2 CAC-0118**

4 **ORIGINAL PREAMBLE AND QUESTION (CAC-0077b and CAC-**
 5 **0077c):**

6 Sections 6.6. addresses a variety of subjects including economy, employment and
 7 training opportunities and business development opportunities. In Chapter 9, Manitoba
 8 Hydro indicates that “the project is designed to . . . maximize economic and social
 9 benefits for the community.” Additional information is requested on the following
 10 matters:

- 11 · As KCN businesses are established please describe the mechanisms to ensure that
 12 they build management capacity, and accumulate capital?
- 13 · How will business development enforce a virtuous community economic
 14 development cycle whereby surpluses are reinvested locally?

15 **FOLLOW-UP QUESTION:**

16 77b. Re line 42-44, “Ultimately, how the communities choose to manage their
 17 businesses and related financial decisions about revenues is their decision.” 77c. Re line
 18 20-22: “The extent to which these opportunities will ultimately translate into long-term
 19 community economic development will vary based on the established governance and
 20 community development processes in each of the KCN communities.”

- 21 · These two points seem to place the burden on the KCN communities to achieve
 22 success. But the Keeyask project is a partnership with Manitoba Hydro as a partner
 23 with the communities.
- 24 · Does Manitoba Hydro not bear any responsibility for the success of KCN business
 25 ventures and or the long term development in the KCNs? If not, what does that say
 26 about the partnership?

27 **RESPONSE:**

28 The follow-up question asserts or assumes that the Partnership has, or should have,
 29 responsibility for managing the businesses and financial affairs of each of the KCNs. This
 30 is not what the Partnership was established to do.

31 As set out in CEC Rd 1 CAC-0076d, CAC-0077a, b and c, CAC-0078, several other IRs, the
 32 JKDA and the Keeyask EIS, a wide array of measures has been put in place for the
 33 Keeyask Generation Project to build capacity through training, local hiring and

- 34 contracting. These measures were developed with substantive input of the KCNs
35 through the course of negotiating and developing the JKDA.
- 36 The Partnership respects the autonomy of the KCNs to make decisions for themselves
37 that affect their future.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: C. 6.6, S**
2 **6.6.5.2 ; Page No.: N/A**

3 **CEC Rd 2 CAC-0119**

4 **ORIGINAL PREAMBLE AND QUESTION (CAC-0078):**

5 Chapter 6.6 discusses a variety of activities expected to develop local businesses and
6 improve employment opportunities. As businesses grow and employment opportunities
7 improve, local tax revenue will increase.

8 Please elaborate on how associated plans for local governments (e.g., band councils) to
9 increase their capacity to manage and effectively utilize these funds?

10 **FOLLOW-UP QUESTION:**

11 Re line 40: "...it is anticipated that these communities will be able to respond to the
12 additional..." Please provide evidence from past projects or evidence from the literature
13 to support your conclusion.

14 **RESPONSE:**

15 There is no scholarly literature reporting on, or speculating, on the future financial and
16 planning capabilities of each of the KCNs. The balance of the question has been asked
17 and answered. The actions of autonomous governmental authorities are, in any event,
18 beyond the scope of this review.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: C. 6.6**
 2 **socio economic environment, C. 8 Monitoring and Follow-up,**
 3 **S.8.2.4, ; Page No.: 8-27, table 5, p. 8-28-8-33**

4 **CEC Rd 2 CAC-0120**

5 **ORIGINAL PREAMBLE AND QUESTION (CAC-0079a):**

6 Funds will be made available for the offsetting programs.

7 Please elaborate on the mechanisms in place to ensure that these funds will be used for
 8 these program and done so efficiently and effectively?

9 **FOLLOW-UP QUESTION:**

10 Re line 34: "...this Annual Program Budget is to be provided to Manitoba Hydro..." The
 11 issues of accountability regarding the offset programs is very important. The response
 12 above suggests that the KCN's are primarily accountable to Manitoba Hydro for the
 13 offset program funds. Could this upward accountability cause some problems vis-à-vis
 14 community impact? The literature on foreign aid finds that accountability to external
 15 donors can reduce the state's accountability to its citizens. Can you explain how this
 16 problem can be addressed?

17 **RESPONSE:**

18 The KLHP disagrees with the assertion that First Nations are accountable primarily to
 19 Manitoba Hydro. The quote taken from the response to CEC Rd 1 CAC- 0079a is
 20 incomplete, the full statement reads: "Pursuant to the AEAs, each First Nation is to
 21 prepare an Annual Program Budget to outline its plans for the coming year's Offsetting
 22 Programs. Each First Nation is to hold a Members' meeting to provide an opportunity
 23 for community members to review and provide input to their elected officials with
 24 respect to the Annual Program Budget for the Offsetting Programs. Following review by
 25 members and approval by Chief and Council, this Annual Program Budget is to be
 26 provided to Manitoba Hydro by December 31 for the upcoming fiscal year."

27 While the Keeyask Hydropower Limited Partnership has a responsibility to ensure that
 28 Adverse Effects Agreement funding is used in accordance with the agreements, primary
 29 accountability for the use of the funds by the KCN leadership is to their respective
 30 Members. A number of steps were taken to promote KCN accountability to Members,
 31 rather than to Manitoba Hydro directly. For example: i) the Annual Program Budgets
 32 are provided to Manitoba Hydro only after review by, and input from, Members, and
 33 following the approval of Chief and Council; ii) Annual Program Reports are to be
 34 provided concurrently to Members and Manitoba Hydro; and iii) if a community chooses
 35 to discontinue an existing offsetting program or to implement a new offsetting program,

36 a proposal for such a change will first be presented to Members at a duly called public
37 meeting, and Manitoba Hydro's consent to the program change will not be
38 unreasonably withheld.

39 The York Factory First Nation AEA is structured differently, as described in the original
40 response (line 20). This agreement also promotes accountability to Members in a
41 number of ways. For example: i) as outlined in Schedule 3 to the York Factory AEA
42 ("YFFN Trust Term Sheet"), the process to create a new offsetting program or make
43 changes to offsetting programs is community-based, including a public meeting of
44 Members, presentation of information to Members, and a vote by Members; ii) The use
45 of the residual compensation is subject to a community-based approval process; and iii)
46 Chief and Council are required to report to Members regarding the implementation of
47 the offsetting programs at least annually.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: C. 6.6**
2 **socio economic environment, C. 8 Monitoring and Follow-up,**
3 **S.8.2.4, ; Page No.: 8-27, table 5, p. 8-28-8-33.**

4 **CEC Rd 2 CAC-0121**

5 **ORIGINAL PREAMBLE AND QUESTION (CAC-0079b):**

6 Funds will be made available for the offsetting programs.

7 In terms of the offsetting programs themselves, please elaborate on the organization
8 that will be put in place and whether it will be one organization or whether each
9 community will create their own.

10 **FOLLOW-UP QUESTION:**

11 Re line 14: "Each of the FNs will have considerable autonomy in establishing their own
12 internal processes related to program implementation..."

- 13 · Given the importance of the offset programs is it not important to have
14 organizations established immediately upon receiving permission to begin
15 construction? If that is the case is it not important for the KCNs to have already
16 deliberated on an organizational structure? Also, if Keeyask is a partnership would it
17 not make sense for Manitoba Hydro to establish a department of community
18 development to maintain ongoing relations with the KCNs?
19 · Does Manitoba Hydro have practical experience or literature to draw from to
20 demonstrate the offset programs, like the ones proposed, work? If so, please
21 provide this information. Will the costs be effectively covered by the offset supports
22 in the face of inflation? Will this funding be protected in the future –5 years and 10
23 years—from changing views at Manitoba Hydro? If so, how?

24 **RESPONSE:**

25 Each question above is answered in turn:

- 26 1. *Given the importance of the offset programs is it not important to have*
27 *organizations established immediately upon receiving permission to begin*
28 *construction? If that is the case is it not important for the KCNs to have already*
29 *deliberated on an organizational structure?*

30 The Partnership agrees that, given the prominence of the adverse effects programs, it is
31 important to have structures in place to provide for the management and
32 implementation of the programs. Each of the Keeyask Cree Nations are working to

33 develop their own organizational structure. In some cases, where programs are already
34 in place, these structures have been established.

35 2. *Also, if Keeyask is a partnership would it not make sense for Manitoba Hydro to*
36 *establish a department of community development to maintain ongoing relations*
37 *with the KCNs?*

38 The Aboriginal Relations Division will oversee the implementation of the Adverse Effects
39 Agreements. This Division includes staff in Winnipeg, as well as northern Manitoba, who
40 have significant experience working with Aboriginal communities and implementing a
41 range of programs and agreements. Manitoba Hydro also has an established Partnership
42 Implementation Section to oversee implementation of the Joint Keeyask Development
43 Agreement.

44 3. *Does Manitoba Hydro have practical experience or literature to draw from to*
45 *demonstrate the offset programs, like the ones proposed, work? If so, please provide*
46 *this information.*

47 While Manitoba Hydro does have experience working with communities to implement
48 programs, the Keeyask offsetting program approach was in fact proposed by the Cree
49 Nation Partners (CNP - Tataskweyak Cree Nation and War Lake First Nation). Adverse
50 effects agreements for past Manitoba Hydro developments have typically provided a
51 lump sum cash payment to a community (usually to be held and administered through a
52 trust) to enable the community to implement mitigation measures at their discretion. In
53 the case of the Keeyask project, the CNP proposed a different approach: that funding be
54 provided on an annual basis, adjusted for inflation, to enable the KCN to operate
55 programs to replace, substitute and/or provide opportunities to offset unavoidable
56 Keeyask adverse effects within their respective communities.

57 Manitoba Hydro reviewed this approach and determined that it had many merits. The
58 approach would provide each community with the flexibility to implement programs to
59 address their specific concerns, while still providing the Partnership with certainty about
60 the overall costs of the adverse effects arrangements. Furthermore, community-based
61 programs designed to specifically address Keeyask adverse effects would provide
62 tangible benefits to individual community members affected by the project. From
63 Manitoba Hydro's perspective, this approach would also provide an opportunity to build
64 and strengthen relationships with the KCN over the longer term. The approach was
65 presented to Fox Lake Cree Nation and York Factory First Nation, who also agreed that it
66 was a reasonable way to proceed.

67 It is also noted that some of the KCN have practical experience in implementing the
68 offset programs. As noted in CEC Rd 1 CAC-0082, TCN operated the TCN Pilot Access

69 Program from the autumn of 2004 to March 31, 2009 when it was converted to a
 70 regular annual program. It is from this experienced position that the CNP negotiated
 71 their offsetting programs to be “as vibrant 50 or 100 years from the commissioning of
 72 Keeyask as they will be the day they come into effect” (CNP Evaluation Report 2012 p.
 73 47).

74 4. *Will the costs be effectively covered by the offset supports in the face of inflation?*

75 As described in the agreement, the guaranteed annual amounts will be adjusted
 76 annually for the change in the consumer price index for Manitoba.

77 5. *Will this funding be protected in the future –5 years and 10 years—from changing
 78 views at Manitoba Hydro? If so, how?*

79 The funding will be provided as outlined in the agreement. In the case of TCN, WLFN,
 80 and YFFN, funding will be provided for the life of the Keeyask Project. Given the nature
 81 of FLCN’s offsetting programs, their AEA funding is provided over a 17-year payment
 82 stream in order to provide for greater up-front funding during Project construction and
 83 the early years of Project operation. Article 11 (“Termination”) in the TCN, WLFN, and
 84 FLCN agreements (Article 9 in YFFN) describes the process that would be followed with
 85 respect to the funding of the offsetting programs in the event that the Joint Keeyask
 86 Development Agreement is terminated.

87 In the event that the KHLP is dissolved after the Keeyask Project is completed and the
 88 closing licenses have been issued, Manitoba Hydro will assume all rights and benefits
 89 under the Agreements and be bound by all undertakings and obligations of the
 90 Agreements.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: C. 6.6**
 2 **socio economic environment, C. 8 Monitoring and Follow-up,**
 3 **S.8.2.4; Page No.: 8-27, table 5, p. 8-28-8-33.**

4 **CEC Rd 2 CAC-0122**

5 **ORIGINAL PREAMBLE AND QUESTION (CAC-0079d):**

6 Funds will be made available for the offsetting programs.

7 Please elaborate on the ongoing monitoring and evaluation of all Keeyask programs –
 8 construction, operations, offsetting program– to ensure that programs are effective and
 9 meeting community interests? Please elaborate on the mechanism for adjustment if
 10 negative results are identified from the monitoring.

11 **FOLLOW-UP QUESTION:**

12 Please describe the training that members of the KCN will receive prior to undertaking
 13 monitoring and evaluation?

14 **RESPONSE:**

15 The training that members of the KCNs will receive prior to undertaking monitoring and
 16 evaluation will depend on the nature of monitoring and the extent of involvement in
 17 monitoring activities. It is anticipated that ATK monitoring would not normally require
 18 training that Manitoba Hydro (on behalf of the Partnership) provides. Nonetheless, if
 19 warranted, the Partnership will work with the KCNs to facilitate opportunities to
 20 participate in existing training opportunities (such as outlined below) upon request.
 21 Furthermore, the Partnership is committed to support KCNs in their ATK monitoring
 22 activities through discussion at the Monitoring Advisory Committee and, for example, by
 23 promoting opportunities for mutual exchange and relationship building between KCN
 24 monitoring experts and Manitoba Hydro personnel.

25 Members involved in technical science monitoring activities have the opportunity to
 26 gain hands-on experience working side by side with technical specialists. CEC Rd 1 CAC-
 27 0008d also describes training initiatives and investments that are intended to encourage
 28 and promote Aboriginals, including KCNs Members, to pursue education and training
 29 opportunities, which could include the environmental field.

30 In the past, appropriate safety training and certifications required to participate in
 31 technical scientific field studies have been provided, as required. Examples of available
 32 training provided in the past for the Keeyask GS Project include:

- 33 · First Aid (Level 2 and 3) & CPR

- 34 . Basic Chainsaw Safety Skills
 - 35 . Firearms Proficiency and Bear Awareness
 - 36 . Bear Awareness and Safety (separate course for non-bear guards)
 - 37 . Transport Canada Pleasure Craft Operator Certification
 - 38 . Cold Weather SurvivalSmall Engine Repair
 - 39 . VHF Radio Training
 - 40 . Swift Water Rescue Boat Operator
 - 41 . All Terrain Vehicle (ATV) Safety
 - 42 . Snowmobile Safety Training Program
- 43 It is anticipated that similar training will be provided, as required, throughout the course
44 of monitoring activities.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 6.6.5.2**
 2 **Community Health, 6.6.4.2, Housing; Page No.: N/A**

3 **CEC Rd 2 CAC-0123**

4 **ORIGINAL PREAMBLE AND QUESTION (CAC-0081a):**

5 KCN notes that there is a housing crisis in their communities. Please elaborate on how
 6 the project will assist in addressing this crisis.

7 **FOLLOW-UP QUESTION:**

8 If the KCNs do not earn income from their partnership –or possibly lose money —the
 9 resultant lower revenues may lead to deterioration in housing as well as other features
 10 of their social economy. Please indicate whether there is any risk in any specific year
 11 that the KCN Nations might not earn income from the partnership or indeed might have
 12 to make contributions from other revenues to the partnership. Are there any options
 13 open to the KCN Nations in which they can mitigate the risks associated with diminished
 14 or lost revenues?

15 **RESPONSE:**

16 If the objective of a KCN is to ensure that it receives annual revenue, then its KCN
 17 Investment Entity will likely elect, no later than 60 days prior to Final Closing Date, to
 18 have its Common Units treated as Preferred Units.ⁱ The holders of Preferred Units are
 19 entitled to receive, each year, the larger of the Preferred Minimum Distribution, payable
 20 whether or not the Partnership has any Distributable Cash available, and the Preferred
 21 Participating Distribution. A KCN Investment Entity which elects to hold its investment in
 22 the form of Preferred Units will not have to repay the loans, and the interest accrued
 23 thereon, advanced by Manitoba Hydro through the Construction Credit Facility.

24 During the period of construction, each KCN Investment Entity is entitled to draw upon
 25 the Construction Credit Facility provided to it by Manitoba Hydro in order to meet the
 26 cash calls for which it will be liable as the holder of Common Units. After the completion
 27 of construction, namely after Final Closing, if a KCN Investment Entity has decided to
 28 continue to hold its Common Units, it will be entitled to draw upon the Operating Credit
 29 Facility provided to it by Manitoba Hydro in order to meet any cash calls to cover
 30 operating or capital expenses which it will be liable to meet as the holder of Common
 31 Units. The Credit Facilities are repayable over a period of 50 years from the Final Closing
 32 Date. Accordingly, no KCN will have to make contributions from “other revenues” in
 33 order to preserve its investment in the Partnership for 50 years. It is possible that a KCN
 34 Investment Entity which chooses to continue to hold Common Units, as opposed to
 35 Preferred Units, will receive no distributions from the Partnership in one or more years

36 in the event that the revenues received by the Partnership are less than the expenses
37 incurred in that year.

38 Each KCN will be entitled to decide for itself how to spend, or to invest, the revenue it
39 receives each year from the Partnership through its KCN Investment Entity and
40 consistent with the terms of the JKDA (see response to CEC Rd 1 CAC-0087). It can
41 choose to spend the money on housing and other community and social developments
42 in its community. To the extent that it decides to spend that revenue on community and
43 social development, that expenditure will contribute to the improvement, not the
44 deterioration, of housing in the community.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: C. 9,**
 2 **9.2.3.1.1; Page No.: 9-2**

3 **CEC Rd 2 CAC-0124**

4 **ORIGINAL PREAMBLE AND QUESTION (CAC-0084a):**

5 There are many asymmetries in this project. How will it be ensured that these
 6 asymmetries do not lead to dominance of one group's interests over another groups?
 7 For instance, KCN communities are tiny in comparison to Manitoba Hydro and even
 8 regarding ownership shares, this imbalance holds. How can it be ensured that KCN
 9 communities have a fair voice in ongoing management of the project?

10 **FOLLOW-UP QUESTION:**

11 Thank-you for your helpful response. The organization you describe can certainly assist
 12 in fostering some level of participation by the KCN members in ongoing operations of
 13 the project. Manitoba Hydro and the KCN have goals in common. They both want the
 14 project to be implemented and run efficiently. However, their goals will inevitably
 15 diverge on some issues from time to time. There is literature on the dispute resolution
 16 system in large bodies such as the World Trade Organization that finds that large states'
 17 interests are more effectively protected relative to small states. This is because the large
 18 states have more resources for experts and lawyers.

- 19 • What will prevent this type of outcome in the face of conflicts between Manitoba
 20 Hydro and the KCNs?
 21 • When there are conflicts of interest, can you explain how actors' interests can be
 22 identified and disputes can be resolved in a way that is mutually beneficial.

23 **RESPONSE:**

24 The Joint Keeyask Development Agreement (the "JKDA") provides a variety of
 25 mechanisms whose purpose is to provide simple and efficient processes to resolve
 26 concerns arising during the operation of the business of the Partnership. For example,
 27 given that Manitoba Hydro will be solely responsible for maintaining the Keeyask
 28 Generating Station and operating it within its existing system and will be allocating the
 29 costs of doing so to the Partnership, it is foreseeable that the KCN Investment Entities
 30 may seek independent review of the amount of those costs. This will be done through
 31 the "expert review" process described in the JKDA which provides for the appointment
 32 of an independent expert to review the costs at issue. The costs of the Expert are borne
 33 by the Partnership. There is opportunity for the Expert to act as a mediator and, in the
 34 event that her or his report does not resolve the issues, there is provision for the
 35 appointment of a second expert. The "expert review" mechanism is also to be used to

36 resolve concerns arising out of the application of the Power Purchase Agreement.
37 Pursuant to this Agreement, Manitoba Hydro will purchase all of the energy and
38 capacity of the Keeyask Generating Station. The amount it will pay will be tied to 'on-
39 peak' and 'off-peak' rates in the marketplace and it is entitled to allocate and deduct
40 certain costs from this amount. It is foreseeable, again, that the KCN Investment Entities
41 may want the rates and costs in question reviewed and that is to be done through the
42 foregoing "expert review" process.

43 When other concerns arise between the Partners, they are to be resolved through a
44 multi-step dispute resolution process. The JKDA mandates that the parties to a dispute
45 must first try to resolve disputes themselves before elevating them to a more formal
46 step. If they are unable to do that, one or more have the option of requiring the
47 Partnership to appoint a neutral third party to conduct a full investigation of the facts in
48 dispute and to provide a report within six weeks. Given that the neutral fact finder is to
49 have access to all parties to the dispute and all relevant documents, there will be
50 opportunity, if the parties agree, to use the neutral fact finder as a mediator. In the
51 event that a dispute remains unresolved, it goes forward to binding arbitration pursuant
52 to *The Arbitration Act* of Manitoba. However, before the arbitration begins, the leaders
53 of each disputing party are obliged to meet and to try in good faith to resolve the
54 matter.

55 The foregoing processes require, at the expense of the Partnership, independent
56 investigation of the facts and evidence relevant to any dispute. Accordingly, a partner
57 advancing a concern will not have to incur at first instance the costs to investigate and
58 state the issues giving rise to a Claim. Moreover, the processes in the JKDA incorporate
59 all of the basic principles applied in any respectable dispute resolution process
60 including: the right to notice of a claim; the right to employ legal counsel to assist in the
61 advancement and resolution of the claim; the right to be heard and to participate in the
62 resolution of a claim; and the right to have disputes resolved by skilled persons who are
63 independent, or neutral, from the parties to the dispute.

64 The KCNs and Manitoba Hydro have an established history of over 20 years of
65 successful resolution of issues between Manitoba Hydro and each individual KCN.

66 All of the foregoing should eliminate the concern that prevails in undemocratic societies
67 that those who have more money can manipulate processes to their advantage. One
68 analysis of the dispute resolution processes followed by the World Trade Organization
69 has found that developing countries successfully pursued 85.5% of the disputes they
70 filed against high-income countries.ⁱⁱ The World Trade Organization has a multi-step
71 dispute resolution process. While these steps do not precisely mirror those set out in
72 the JKDA, they do incorporate the same fundamental principles summarized above.

73 When conflicts of interest arise between parties, they are best identified by following
74 the standard recommendations in any good text on negotiation. The Parties are well-
75 advised to listen carefully to what each is saying. Further, they are well-advised to think
76 through their own needs and interests and to understand before a negotiation begins
77 what their objectives are. Both parties ought to identify the norms and values the other
78 side respects and to advance arguments and interpretations that bring into play
79 relevant norms, values and standards. Successful negotiations require a level of candour
80 and sensible 'signaling' to the other side to a conflict what one's interests and
81 alternatives to resolution are. When conflicts arise between parties who will have an
82 ongoing relationship beyond the current conflict, each has to be sensitive to
83 compromises that may be important to maintain the relationship. Perhaps most
84 important of all is the choice of one's negotiators. Each individual has her and his own
85 style of negotiating and the resolution of particular conflicts often requires that the
86 negotiating styles of the negotiators be understood and be taken into account. While
87 parties are always well-advised to try to find a resolution that is "mutually beneficial",
88 one must acknowledge that ideal is not always achievable and, where there will be no
89 future relationship between the parties, the realization of "mutual benefit" will
90 sometimes be less relevant. The Partners in the KHLP will necessarily have an ongoing
91 relationship for the life of the Project; hence, they will necessarily be sensitive to
92 compromises and "mutual benefits".

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: C. 9,**
 2 **9.2.3.1.1; Page No.: 9-2**

3 **CEC Rd 2 CAC-0125**

4 **ORIGINAL PREAMBLE AND QUESTION (CAC-0084b):**

5 Within KCN communities some people did not support the project. How will their
 6 interests be protected as the project is implemented?

7 **FOLLOW-UP QUESTION:**

8 If the Keeyask project goes ahead, Manitoba Hydro's influence on the regional economy
 9 will be materially increased and Hydro will become a major actor in this region's
 10 economy. Does Manitoba Hydro acknowledge that it carries an ethical burden to
 11 ensure it is not harming the local communities and, hopefully, helping them?

12 **RESPONSE:**

13 Manitoba Hydro already is a "major actor" in the economy of Northern Manitoba. The
 14 impact of Manitoba Hydro's existing developments upon the economy and the
 15 environment in the region is explicitly acknowledged in the Response to EIS Guidelines.

16 Manitoba Hydro recognizes that it carries the same ethical burden as each individual
 17 and corporate citizen of Canada - namely, to act so as not intentionally to cause physical
 18 harm to any person. Put another way, each citizen, individual or corporate, of Canada is
 19 obligated to respect the federal and provincial laws of this country, the objective of
 20 many of them being the prohibition of acts intended to cause physical harm to another
 21 person.

22 The assessment of whether or not a project, a government policy, a business decision,
 23 or a recreational activity may cause "harm" to a community or a society in the sense
 24 that it may be in opposition to the views of some, may annoy some, may result in
 25 competition with some, may reduce the number of animals, fish or plants, or may result
 26 in the increase in the numbers of some animals, fish or plants to the detriment of
 27 others, must be done as objectively as possible and, in the final result, in a democracy,
 28 will be determined by the will of the majority.

29 Manitoba Hydro recognizes that the hydro-electric energy it produces provides an
 30 essential benefit to all of the communities who receive its services. Moreover, it
 31 recognizes the importance of endeavouring to improve its relationship with Aboriginal
 32 communities and, with respect to the Keeyask Project, is proud of the fact that four First
 33 Nations in the immediate vicinity of the Project have benefited and will benefit from the
 34 opportunity to share their knowledge with Manitoba Hydro in the design and planning

35 of the Project, from the opportunity to share in the business opportunities and jobs
36 necessary to build and operate the Project and from the opportunity to share in the
37 revenues the Project will generate over its lifetime.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: C. 9,**
 2 **9.2.3.1.1; Page No.: 9-2**

3 **CEC Rd 2 CAC-0126**

4 **ORIGINAL PREAMBLE AND QUESTION (CAC-0084c):**

5 "In contrast to the past, the Project puts into practice the proposition of greater
 6 empowerment of local indigenous people." It is claimed that the project will empower
 7 KCN communities. How does KHLP define empowerment? How does it expect that the
 8 project will lead to empowerment? Chapter 9, Section 9.2.1, Page 9-2.

9 **FOLLOW-UP QUESTION:**

10 Defining empowerment as enabling one or more persons to do something is helpful.
 11 One presumes the definition also encompasses a pre-eminent role for the persons in
 12 identifying the task to be done along with enablement in developing the capacity to
 13 achieve the task. Please provide the literature or evidence from past experience
 14 demonstrating that the community development aspects of the Keeyask project are
 15 effective?

16 **RESPONSE:**

17 The effectiveness of a process or program is usually demonstrated by how many
 18 persons participate in the program or how many respond to the opportunities offered.
 19 With respect to the business opportunities that form part of the Keeyask Project, the
 20 KCN participated throughout negotiations in identifying the work to be allocated as
 21 Direct Negotiated Contracts ("DNCs") and in dividing the DNCs among themselves. DNCs
 22 have already been negotiated and in some cases, performed, for work required and
 23 licensed for the Keeyask Infrastructure Project. Negotiations for work to be done for the
 24 Keeyask Project have begun. Identified DNCs are being actively pursued by the KCN and,
 25 in addition, each is now exploring additional opportunities to participate in other
 26 contracts required for the Keeyask Project.

27 With respect to training and employment opportunities, in excess of 2,000 persons
 28 participated in the various courses and training opportunities that were made possible
 29 through the provision of some \$60 Million by Manitoba Hydro, the Province of
 30 Manitoba and the federal government through the Wuskwatim and Keeyask Training
 31 Consortium. And each community has been developing programs intended to provide
 32 the appropriate education to its young people with a view to them being able to apply
 33 successfully for operational jobs with Manitoba Hydro.

34 Using the level of participation experienced to date as the yardstick, the “community
35 development” provisions of the Keeyask Project have to date been effective and
36 promise to continue to be so.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 6.6.5.6;**
 2 **Page No.: 6-488**

3 **CEC Rd 2 CAC-0127**

4 **ORIGINAL PREAMBLE AND QUESTION (CAC-0085):**

5 There are a variety of frameworks used to address ethical aspects of major decisions.
 6 There range from simple rules such and Pareto Optimality through to more elaborate
 7 theories such as the capability theory. Original Question: Given the project has stated
 8 that it will cause 'sorrow' to the communities regarding culture and spiritual issues,
 9 what ethical framework was used to weigh this against the benefits?

10 **FOLLOW-UP QUESTION:**

11 With regard to the "ethical framework" used to weigh cultural and spiritual adverse
 12 residual effects (as well as other adverse residual effects) against benefits of the Project,
 13 the KCN applied their own world view (and therefore their own ethical framework) in
 14 assessing the project. See response to CEC Rd 1 CAC-0075b.

15 · If a community assesses a new project does it necessarily utilize its worldview,
 16 values and experience? Or, faced with a 'foreign' idea (i.e., a dam) and a 'foreign'
 17 process (i.e., environmental impact assessment), is it possible that it utilizes 'other'
 18 worldviews, values, and experiences? Can you explain how the Environmental
 19 Impact Assessments and referendum undertaken by the KCN necessarily mean that
 20 they used their worldview, values and experiences?

21 **RESPONSE:**

22 *If a community assesses a new project does it necessarily utilize its worldview, values*
 23 *and experience?*

24 Yes. Worldview, values and experience are inherent in making a decision. This is
 25 especially the case for the KCNs, as their worldview, values and experiences have all
 26 been influenced by past events, including previous hydroelectric development.

27 *Or, faced with a 'foreign' idea (i.e., a dam) and a 'foreign' process (i.e., environmental*
 28 *impact assessment), is it possible that it utilizes 'other' worldviews, values, and*
 29 *experiences?*

30 *Can you explain how the Environmental Impact Assessments and referendum*
 31 *undertaken by the KCN necessarily mean that they used their worldview, values and*
 32 *experiences?*

33 The proposed Keeyask Generation Project will be the fifth major generating station to
34 be constructed and operated on the Nelson River, in the traditional territory of all the
35 KCNs. In this sense, "a dam" is not a foreign idea to any of the KCNs. The worldview,
36 values and experience of the KCNs are influenced by their experience with previous
37 hydroelectric developments and were integral to each community's assessment of
38 Keeyask. Throughout the EA process, the KCNs made it quite clear that they were
39 examining the Project and its effects from their worldview. They also indicated that their
40 knowledge about the world incorporated their first-hand experience of past
41 hydroelectric development.

1 **REFERENCE: Volume: Socio-Economic Supporting Volume; Section:**
 2 **3-12; Page No.: N/A**

3 **CEC Rd 2 CAC-0128**

4 **ORIGINAL PREAMBLE AND QUESTION (CAC-0086):**

5 Is there a literature indicating that the type of preferential treatment being used by the
 6 project for First Nation-owned businesses is effective? If so, please provide any
 7 literature in the possession of the partnership evaluating the success.

8 **FOLLOW-UP QUESTION:**

9 The decision to engage in business relationships with First Nations-owned businesses
 10 was not based on literature, but rather on experience gained through past projects.
 11 Implementing Manitoba Hydro's Northern Purchasing Policy and Direct Negotiation
 12 Contracts (DNC) on Wuskwatim, on various transmission lines and other projects
 13 throughout Manitoba has yielded successful results for both the project and First
 14 Nations-owned businesses. As stated in the Joint Keeyask Development Agreement
 15 (JKDA), an objective of the Partnership is to expand the number, capacity, diversity and
 16 viability of KCNs Businesses. DNCs and the Northern Purchasing Policy are proven
 17 methods of achieving these Partnership objectives.

- 18 · Please provide any independent evaluations of Manitoba Hydro's Northern
 19 Purchasing Policy and Direct Negotiation Contracts (DNC) on Wuskwatim
 20 demonstrating successful results for both the project and First Nations-owned
 21 businesses.
- 22 · Please provide any commentary from NCN regarding Manitoba Hydro's Northern
 23 Purchasing Policy and Direct Negotiation Contracts (DNC) on Wuskwatim
 24 demonstrating successful results for both the project and First Nations-owned
 25 businesses.
- 26 · Please provide the empirical evidence relied upon by Hydro to demonstrate that
 27 DNCs and the Northern Purchasing Policy are proven methods of achieving these
 28 Partnership objectives.
- 29 · Please provide the criteria relied upon by Hydro to demonstrate that DNCs and the
 30 Northern Purchasing Policy are proven methods of achieving these Partnership
 31 objectives.

32 **RESPONSE:**

33 No such independent evaluations have been done with respect to the Northern
 34 Purchasing Policy and the analyses with respect to Wuskwatim are not completed at this
 35 time.

36 The commentary received from NCN has been extended and received on the basis that
37 it is confidential between the parties and thus is not available for public release. In any
38 event, the level of profit realized by NCN is confidential to NCN and disclosure of same is
39 not compellable by Manitoba Hydro. Were such details disclosed to Manitoba Hydro,
40 they could prejudice NCN in future negotiations for DNCs. Were Manitoba Hydro to
41 disclose the details of how it applies the Northern Purchasing Policy in its assessment of
42 a fair price to award on a contract to which the Policy is being applied, such disclosure
43 would prejudice Manitoba Hydro in the application of the Policy in the future.

44 Manitoba Hydro is satisfied that the Northern Purchasing Policy and the allocation of
45 certain contracts to direct negotiation are effective ways in which to ensure that
46 Aboriginal businesses and joint ventures can successfully be awarded contracts. Neither
47 the application of the Policy nor the award of a DNC constitutes a 'guarantee' that the
48 successful contracting party will earn a profit or will earn the profit it has estimated.
49 However, the fact that Aboriginal businesses over the last 20 years continue to advocate
50 for the application of the Policy and the expansion of contracts that can be negotiated
51 directly with them is indicative that the Policy and DNCs are needed, wanted and
52 effective. In the absence of employing these approaches, it is unlikely that many
53 Aboriginal businesses would be able to compete successfully for contracts given their
54 inexperience and general lack of capital. How a First Nation or other Aboriginal
55 organization spends the profits realized on a contract is confidential to the contracting
56 party and not compellable by Manitoba Hydro. However, Manitoba Hydro has seen, in
57 the case of the KCN, the formation of joint ventures with established, non-Aboriginal
58 contractors that did not exist before, the acquisition of equipment by the KCN that they
59 did not have before, and the undertaking of contracts in aspects of construction and
60 services that are new to the First Nations in question. Manitoba Hydro views those
61 developments as beneficial to the KCN.

62 Of the \$359 million in contracts awarded to Manitoba companies by Manitoba Hydro in
63 the 2011-2012 fiscal year, \$62 million was awarded to Manitoba Aboriginal companies,
64 largely, pursuant to the Northern Purchasing Policy and through direct negotiation.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 6.2.3.2**
 2 **Physical Environment, 6.5.8.2.1 Moose - Construction Effects and**
 3 **Mitigation (R to EIS); CNP Environmental Evaluation Report; FLCN**
 4 **Environmental Evaluation Report; 7.3.6.4 Moose, 7.4.6.3 Moose**
 5 **(TE SV); Results of Mammal, Reptile & Amphibian Investigations;**
 6 **Page No.: N/A**

7 **CEC Rd 2 CAC-0129**

8 **ORIGINAL PREAMBLE AND QUESTION (CAC-0047):**

9 FLCN members point to the importance of willow, alder and hazel along current
 10 shorelines on Stephens Lake and Gull Lake as good moose feeding areas, all of which will
 11 be lost to flooding. TCN/WL members indicate that local veneer bogs, also set to be
 12 flooded, are used as important calving areas. CNP Members have indicated that veneer
 13 bogs (peatlands less than 1.5 m deep that generally occur on slopes) are occupied in wet
 14 seasons and are used as calving areas. FLCN members make mention of other key
 15 calving areas and in particular islands in both Stephens Lake and Gull Lake (of which 42%
 16 had moose present when surveyed in summer).

- 17 · Given the important role that specific shorelines, veneer bogs and islands play as
 18 prime moose habitat within the Local Study Area, please comment on the
 19 significance of their loss through Project construction and operation, and reconcile
 20 those comments with the finding in the EIS that because “peatlands are low quality
 21 habitat for moose, the predicted habitat composition trend for moose is likely to be
 22 neutral”.
- 23 · Similarly, please reconcile the environmental assessment of the KCNs, that point to
 24 declines in moose numbers sufficiently high to force their hunters to travel further
 25 afield, with the regulatory finding that the “effect on moose will likely be negligible
 26 to small”.

27 **FOLLOW-UP QUESTION:**

28 The statement in the EIS that “peat lands are low quality habitat for moose” stands
 29 irrespective of whether it is found in a section looking at changes expected with or
 30 without the Project. As such, to rephrase the question:

31 Do the Partners believe that peat lands in the Local Study Area to be of low, medium or
 32 high quality habitat?

33 How abundant are moose in the Local Study Area? What % of moose habitat in the Local
 34 Study Area will be adversely affected by the Project? Can you provide these figures for
 35 each of Zones 1, 2, 3 and 4?

36 **RESPONSE:**

37 Each of the questions above is answered in turn below.

38 *Do the Partners believe that peat lands in the Local Study Area to be of low, medium or*
 39 *high quality habitat?*

40 Peatlands in the Keeyask region vary considerably in their productivity and
 41 characteristics. As a result, the suitability of peatlands as moose habitat cannot be
 42 evaluated in a general, overall manner. The Moose Habitat Model (TE SV; Section
 43 7.3.6.4.4) indicates the various types of peatlands that are important to moose as either
 44 primary or secondary habitat (see TE SV (Table 7-27)). As such, some of the broader
 45 peatland habitat types including jack pine, low vegetation, and tall shrub type peatlands
 46 were considered to be more important (or higher quality) to moose compared to many
 47 of the black spruce dominated peatland types (lower quality). Please also refer to CEC
 48 Rd1 CAC-0048a, and CEC Rd1 CAC-0048b for further information on the influence of the
 49 Project on peatlands and moose habitat.

50 *How abundant are moose in the Local Study Area?*

51 There are approximately 125 moose in the Local Study Area (Knudsen *et al.* 2010). The
 52 area to be managed under the Kitchissippi unit Appendix C (CEC-0015 Moose Harvest
 53 Sustainability Plan-Draft-18Jun2013 Extracted Appendix), where most of the human
 54 disturbances have occurred from past, present and future projects, had a population of
 55 337 moose in 2010. Moose densities that were used to describe this population, have
 56 variable abundance estimates. The majority of the Kitchissippi unit (75%) had moose
 57 densities described as extra-low (0.02 moose/km²) or low (0.04 moose/km²), with the
 58 remaining 25% described as medium (0.08 moose/km²) or high (0.30 moose/km²;
 59 Knudsen *et al.* 2010). Comparatively, the average density of moose in the Local Study
 60 Area derived from block surveys between 2002 and 2006 was 0.13 moose/km². The
 61 nearest comparable abundance estimate to the survey blocks sampled is medium;
 62 however, the variance throughout the Local Study Area is expected to be similar to the
 63 Kitchissippi unit as these two areas overlap. Further information of moose abundance
 64 can be found in the TE SV Section 7.3.6.4.5, that described moose sign on transects as
 65 abundant and widespread.

66 *What % of moose habitat in the Local Study Area will be adversely affected by the*
 67 *Project? Can you provide these figures for each of Zones 1, 2, 3 and 4?*

68 Where the benchmark was reported for moose involving habitat affected, it was
69 assumed that 100% of the habitat would be affected in Study Zones 1 and 2. About 1%
70 of the available moose habitat in the Regional Study Area (Study Zone 5) is estimated to
71 be adversely affected, which is the appropriate comparison area for this moose
72 population. The Regional Study Area is estimated to support 950 moose (TE SV, Section
73 7.3.6.6.4).

74 **REFERENCES:**

75 Knudsen, B., Berger, R., Johnstone, S., Kiss, B., Paille, J. and Kelly, J. 2010. Keeyask
76 Project environmental studies program: Split Lake Resource Management Area
77 moose survey 2009-2010. A report for Manitoba Hydro prepared by Wildlife
78 Resource Consulting Services MB Inc. 145 pp.

79 Moose Harvest Sustainability Plan. 2013. Appendix C. [http://keeyask.com/wp/wp-](http://keeyask.com/wp/wp-content/uploads/2013/07/Moose-Harvest-Sustainability-Plan-Draft-18Jun2013-Extracted-Appendix.pdf)
80 [content/uploads/2013/07/Moose-Harvest-Sustainability-Plan-Draft-18Jun2013-](http://keeyask.com/wp/wp-content/uploads/2013/07/Moose-Harvest-Sustainability-Plan-Draft-18Jun2013-Extracted-Appendix.pdf)
81 [Extracted-Appendix.pdf](http://keeyask.com/wp/wp-content/uploads/2013/07/Moose-Harvest-Sustainability-Plan-Draft-18Jun2013-Extracted-Appendix.pdf)

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 6.5.8.3**
 2 **Beaver (R to EIS); YFFN Our Voices Evaluation Report; FLCN**
 3 **Environmental Evaluation Report; 7.3.6.2 Beaver and 7.4.6.1**
 4 **Valued Environmental Components – Beaver (TE SV) ; Page No.:**
 5 **N/A**

6 **CEC Rd 2 CAC-0130**

7 **ORIGINAL PREAMBLE AND QUESTION (CAC-0048a):**

8 Moose rely on beaver for the creation of high quality habitat. According to technical
 9 science reports and KCN environmental assessments, a combination of shoreline
 10 changes, the seasonal reversal of water flow from system operations, flooding, changes
 11 in winter water levels and unpredictable ice conditions will all contribute to the direct
 12 mortality of beaver and/or impede individual home range reestablishment in the Local
 13 Study Area.

14 Given these predictions, please provide information on the expected impact that such
 15 declines in the local beaver population, as a keystone species, will have on local moose
 16 populations.

17 **FOLLOW-UP QUESTION:**

18 In Lines 18-20 of your response, the comment that the seasonal reversal of water flow
 19 from system operations is not a Project effect (rather it is something that was already
 20 altered by previous hydroelectric developments) would likely be challenged by KCN
 21 who consider Keeyask to be the most recent stage of, what they consider to be, one
 22 large Hydro Project that began in the late 1950s.

- 23 • When you say 10% of the beaver population is “expected to be affected”, do you
 24 mean to say ‘killed’? If not, what does affected mean?
 25 • When you talk about colonies or lodges being “removed”, what does that
 26 constitute? In removing colonies, are those animals killed directly or likely to die as a
 27 result of their removal? Or will they be relocated somewhere else?
 28 • Why wasn’t the Local Study Area surveyed in its entirety in order to calculate beaver
 29 mortality in the LSA?

30 **RESPONSE:**

31 As stated in the Response to EIS Guidelines (Section 6.5.8.3) and in CEC Rd 1 CEC-0021,
 32 the effects of past and current projects, including the seasonal reversal of water flow
 33 from previous hydroelectric development, on beaver (and other VECs) were

34 considered as part of the effects assessment for Keeyask. . The effects of earlier
35 developments on beaver are described in Section 6.2.3.4.7 of the Response to EIS
36 Guidelines.

37 *When you say 10% of the beaver population is "expected to be affected", do you mean*
38 *to say 'killed'? If not, what does affected mean?*

39 The original response indicated "The Project-related beaver mortality will mainly be due
40 to the removal of 20 to 30 colonies in the Project Footprint (Study Zone 1) prior to
41 clearing and flooding; approximately 10% of the beaver population is expected to be
42 affected along with approximately 5% of beaver habitat in the Local Study Area (TE SV
43 Section 7.4.6.1.2)." Beaver mortality due to the removal of colonies was being referred
44 to, and these beaver will be trapped out (killed) by KCNs registered trappers during the
45 construction phase. The disposition of meat and fur will follow all regulations and
46 standards established by the Provincial authority.

47 *When you talk about colonies or lodges being "removed", what does that constitute? In*
48 *removing colonies, are those animals killed directly or likely to die as a result of their*
49 *removal? Or will they be relocated somewhere else?*

50 As the future reservoir impoundment (Study Zone 1) will flood beaver lodges, beaver
51 will be humanely trapped out (killed) of affected areas to prevent the exposure and
52 displacement deaths of these animals. Please see the Preliminary Terrestrial Effects
53 Monitoring Plan Section 6.1.3 for more detail about monitoring the removal of beaver.

54 *Why wasn't the Local Study Area surveyed in its entirety in order to calculate beaver*
55 *mortality in the LSA?*

56 As indicated in the response to CEC Rd 1 CAC-0048b, the entire Local Study Area (Study
57 Zone 3) was surveyed in 2001 and 2003. It was not surveyed in its entirety in 2011
58 because the purpose of this later survey was to count the number of colonies to be
59 trapped out during construction.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 6.5.8.3**
 2 **Beaver (R to EIS); YFFN Our Voices Evaluation Report; FLCN**
 3 **Environmental Evaluation Report; 7.3.6.2 Beaver and 7.4.6.1**
 4 **Valued Environmental Components – Beaver (TE SV) ; Page No.:**
 5 **N/A**

6 **CEC Rd 2 CAC-0131**

7 **ORIGINAL PREAMBLE AND QUESTION (CAC-0048a and CAC-**
 8 **0048b):**

9 Moose rely on beaver for the creation of high quality habitat. According to technical
 10 science reports and KCN environmental assessments, a combination of shoreline
 11 changes, the seasonal reversal of water flow from system operations, flooding, changes
 12 in winter water levels and unpredictable ice conditions will all contribute to the direct
 13 mortality of beaver and/or impede individual home range reestablishment in the Local
 14 Study Area.

15 Given these predictions, please provide information on the expected impact that such
 16 declines in the local beaver population, as a keystone species, will have on local moose
 17 populations.

18 It is expected that between 20 to 30 active beaver colonies will be removed during
 19 clearing in Zone 1. While this is less than 10% of the estimated population in the
 20 Regional Study Area, what percentage does it constitute of the estimated population in
 21 the Local Study Area (Terrestrial Zones 1-4)? In terms of impact on the Local Study Area,
 22 would the effect of removing this many beaver colonies still be considered “small”. If
 23 not, what would the predicted magnitude be?

24 **FOLLOW-UP QUESTION:**

- 25 · Is the removal of 18-36% of colonies in the Local Study Area akin to a mortality rate
 26 of 18-36% of beavers in the Local Study Area? (48b)
- 27 · Please provide the derivation of this figure of 18-36% taking into account your
 28 statement that 59% of active lodges in the LSA will be removed?
- 29 · Why is the removal (mortality?) rate in the LSA not given as 59% rather than the
 30 stated range of 18-36%?
- 31 · It is mentioned that beavers “can replace [up to?] annual mortality of 30%, and can
 32 compensate for even greater losses through increased reproduction” (48a). Is that
 33 figure of 30% met through a single reproductive cycle?
- 34 · Assuming this is dependent on the presence of beavers of a reproductive age, how
 35 is the beaver population in the Local Study Area expected to replace annual

36 mortality (after removal of 59% of active lodges) and compensate for losses through
37 increased reproduction?

38 **RESPONSE:**

39 Each of the above questions are answered in turn.

40 *Is the removal of 18-36% of colonies in the Local Study Area akin to a mortality rate of*
41 *18-36% of beavers in the Local Study Area? (48b).*

42 As beaver are to be trapped prior to filling the reservoir, the one-time mortality rate, if
43 based on active lodges only, will be approximately 59%. This rate may be lower or
44 higher as beavers are capable of migrating to and creating new habitat, using old lodges
45 or abandoning them and dispersing prior to and during construction. See CEC Rd 2 CAC-
46 0130 for information on beaver removal.

47 *Please provide the derivation of this figure of 18-36% taking into account your statement*
48 *that 59% of active lodges in the LSA will be removed?*

49 To clarify, as stated in the original response to CEC Rd 1 CAC-0048b, based on data from
50 2001, 59% of active beaver lodges will be lost (i.e., beavers will be removed) in the Local
51 Study Area and 18-36% of active and inactive lodges will be lost in the Local Study Area.
52 Inactive beaver lodges were included to represent potential beaver habitat.

53 *Why is the removal (mortality?) rate in the LSA not given as 59% rather than the stated*
54 *range of 18-36%?*

55 The number of colonies lost (not mortality rate) is stated both ways in the original
56 response to CEC Rd 1 CAC-0048b as inactive beaver lodges represent important
57 potential beaver habitat. Mortality rate should be viewed as approximately 59% within
58 the Local Study Area as inactive lodges are presumed not to contain any beavers.

59 *It is mentioned that beavers "can replace [up to?] annual mortality of 30%, and can*
60 *compensate for even greater losses through increased reproduction" (48a). Is that figure*
61 *of 30% met through a single reproductive cycle?*

62 Beaver are polyestrous, and are capable of having 3-4 kits per year. Based on the
63 findings of Payne (1989) annual reproduction of beavers is sufficient to compensate for
64 a 30% mortality rate.

65 *Assuming this is dependent on the presence of beavers of a reproductive age, how is the*
66 *beaver population in the Local Study Area expected to replace annual mortality (after*
67 *removal of 59% of active lodges) and compensate for losses through increased*
68 *reproduction?*

69 The loss of beaver colonies represents a relatively small portion of the population within
70 the Regional Study Area. As the local and regional populations are connected to one
71 another, immigration and reproduction within the Regional Study Area should be
72 sufficient to maintain a viable regional beaver population, even if other mortality factors
73 are affecting the population change.

74 **REFERENCES:**

75 Payne, N.F. 1989. Population dynamics and harvest response of beaver. Fourth Eastern
76 Wildlife Damage Conference. 134 pp.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: EIS Exec**
 2 **Sum; YFFN Environmental Evaluation Report; FLCN**
 3 **Environmental Evaluation Report; CNP Keeyask Environmental**
 4 **Evaluation Report; Appendix 9A (PE SV); 6.3.8.2 Sedimentation (R**
 5 **to EIS) ; Page No.: 24 (Exec Sum); 22, 43, 63-94 (YFFN); 4-7, 46-47,**
 6 **76, 82-84 (FLCN); 9A-7 (PE SV); 6-215 (R to EIS)**

7 **CEC Rd 2 CAC-0132a**

8 **ORIGINAL PREAMBLE AND QUESTION (CAC-0049a):**

9 While the cycling of sediments and nutrients is essential to a healthy aquatic ecosystem,
 10 too much sediment and nutrient entering a waterway can have negative impacts on
 11 water quality and aquatic life. For the KCNs, the importance of water and water quality
 12 to local people is readily apparent. When the Executive Summary states that “water
 13 quality will always be suitable for aquatic life in the main part of the reservoir”, this
 14 appears to contradict the KCN environmental evaluation reports that stress: (i) the
 15 impact that previous dam construction and reservoir impoundment have had on the
 16 declining quality and health of aquatic life in affected water bodies, with declines in
 17 water quality seen as a key cumulative impact/effect of hydro development in the
 18 region; and, (ii) how the release of peat and other sediment, along with increased
 19 mercury levels, is expected to negatively impact water quality in the study area,
 20 especially in places such as Gull Lake and Stephens Lake where fish habitat is predicted
 21 to be negatively impacted to the point of no longer being viable.

22 In light of the observations and views of the KCNs, and an acknowledgement of
 23 uncertainty as to the magnitude of subsequent changes in sediments, nutrients, and
 24 metals, and decreases in dissolved oxygen, please provide information to support the
 25 validity of this statement on water quality and in doing so respond to the discrepancies
 26 apparent upon comparing the EIS technical science findings with the KCN environmental
 27 evaluation reports. What, for example, constitutes the “main part” of the reservoir and
 28 is water quality indeed expected to decline in Gull Lake and Stephens Lake to the point
 29 whereby aquatic life is negatively impacted? Not all organic sediment will be suspended
 30 in water bodies. Much will be deposited on the bottom of the river channel. For areas
 31 that will become depositional environments, please explain fully any negative effects
 32 associated with such deposits, and particularly for the area between Gull Lake and the
 33 Keeyask GS.

34 **FOLLOW-UP QUESTION:**

35 Could you provide some examples of the kinds of adaptive measures that could be
 36 envisioned in the event of anticipated effects to water quality?

37 **RESPONSE:**

38 It is understood that the question regarding adaptive measures pertains to
39 unanticipated effects to water quality in the main part of the reservoir, based on the
40 text of lines 36-38 of CEC Rd 1 CAC -0049: " *Lastly, if monitoring shows that water*
41 *quality in the main part of the reservoir is not suitable for some or all aquatic life, what*
42 *adaptive measures are being considered in response to such an eventuality?"*

43 As noted in the response to CEC Rd 1 CAC -0049, the type of adaptive measure would
44 depend on the nature of the unanticipated effect and its impact on the aquatic
45 environment. The first steps in the identification of an unanticipated result involve
46 confirmation and better delineation of the impact of interest as follows:

- 47 1. Confirm results;
- 48 2. Attempt to identify cause of the effect (including whether or not it is Project-
49 related);
- 50 3. Evaluate chemical/physical/biological data as a whole to evaluate potential effect
51 on aquatic life (i.e., is there an indication of an adverse effect of water quality on
52 resident biota?);
- 53 4. Conduct focused studies (e.g., targeted or site-specific toxicity studies to evaluate
54 effect on local environment and biological communities); and
- 55 5. Develop/Implement appropriate mitigation measures.

56 Two *hypothetical* examples of potential approaches to mitigation are provided below:

57 Example 1: Concentrations of total suspended solids (TSS) are well above predicted
58 levels.

59 The suitability of spawning beds and survival of eggs and larval fish could be adversely
60 affected by TSS concentrations substantially above predicted values. If monitoring were
61 to show that, for example, the function of spawning habitat at or in the vicinity of
62 Birthday Rapids was being adversely affected by TSS, then an attempt would be made to
63 determine whether sediments are arising from local erosion due to the Project and the
64 site would be assessed to determine whether methods to reduce erosion could be
65 implemented.

66 Example 2: Concentrations of dissolved oxygen reach critically low levels throughout the
67 reservoir during winter.

68 Unanticipated declines in dissolved oxygen could arise due to greater release of organic
69 materials from flooded areas or less mixing of the water column in the main part of the
70 reservoir than predicted. It is unlikely that either of these pathways of effect can be
71 mitigated given the scale of the Keeyask reservoir. Therefore, adaptive management
72 would focus on the end result to VECs. For example, as a result of low dissolved oxygen

73 and subsequent lack of overwintering habitat, the reservoir may be less productive for
74 VEC fish species in the initial years of operation; government regulators may require
75 that additional fish compensation be provided at offsite locations to offset these losses.

1 **REFERENCE: Volume: KCN Evaluation Reports; Section: N/A; Page**
 2 **No.: N/A**

3 **CEC Rd 2 CAC-0132b**

4 **ORIGINAL PREAMBLE AND QUESTION (CAC-0049a):**

5 While the cycling of sediments and nutrients is essential to a healthy aquatic ecosystem,
 6 too much sediment and nutrient entering a waterway can have negative impacts on
 7 water quality and aquatic life. For the KCNs, the importance of water and water quality
 8 to local people is readily apparent. When the Executive Summary states that “water
 9 quality will always be suitable for aquatic life in the main part of the reservoir”, this
 10 appears to contradict the KCN environmental evaluation reports that stress:

- 11 i. the impact that previous dam construction and reservoir impoundment have had on
 12 the declining quality and health of aquatic life in affected water bodies, with
 13 declines in water quality seen as a key cumulative impact/effect of hydro
 14 development in the region; and,
 15 ii. how the release of peat and other sediment, along with increased mercury levels, is
 16 expected to negatively impact water quality in the study area, especially in places
 17 such as Gull Lake and Stephens Lake where fish habitat is predicted to be negatively
 18 impacted to the point of no longer being viable.

19 **FOLLOW-UP QUESTION:**

20 The Partnership refers the reader to PE section 7 and TAC 72. However, having checked
 21 PE section 7 (and specifically section 7.4.2.3), as well as TAC Round 1 DFO-0072, it is still
 22 unclear what percentage of peat released from flooded terrestrial areas will settle in the
 23 bays of origin? This is variously described as the “majority” or “most”, but without
 24 specific figures, it is not possible to know where we are talking about 51% or 99% of
 25 peat deposition.

26 **RESPONSE:**

27 Based on consideration of the transport of mobile peat plus factors related to the
 28 shallow locations where broken down peat originates and settling rates of broken down
 29 peat, the amount of organic sediment likely to be transported out of the flooded bays is
 30 expected to be a small portion of the total organic loading.

31 Of the overall peat (organic) loading to the reservoir, the floating peat that is potentially
 32 mobile is considered to potentially be transported away from where it originates.

33 Floating peat that is not mobile would remain where it originates. As noted in response
 34 to CEC Rd 2 CAC-0052b, in Years 1, 2-5, and 6-15 of operation approximately 25%, 76%
 35 and 62% of the mass of floating peat (mats and chunks) is respectively identified as

36 potentially mobile. This represents approximately 7%, 21% and 14% of the total peat
37 loading in each period respectively, as noted in CEC Rd 1 CAC-0052a.

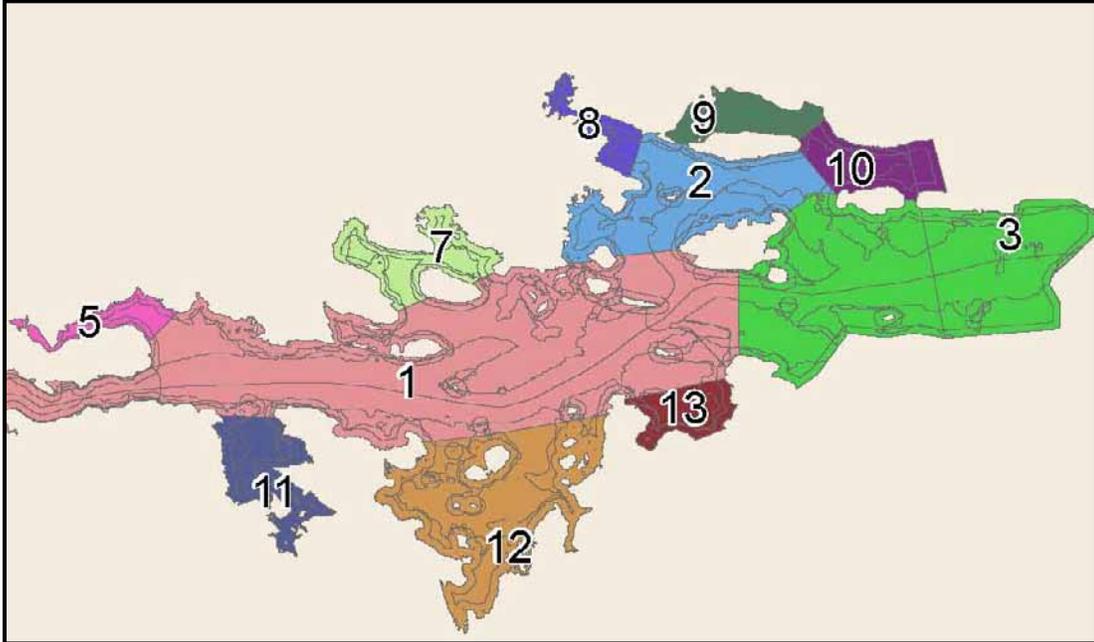
38 The peat transport analysis considered the potential movement of mobile peat due to
39 wind and flow induced currents to identify the fate of mobile peat (Physical
40 Environment Supporting Volume (PE SV), Sections 7.2.5.2, 7.4.2.3 and Appendix 7A).
41 Transported peat generally ends up moving to shallow nearshore areas where it
42 accumulates and may be broken down, either within the peat transport zone in which it
43 originates or in another zone to which it is transported (see Figure 1 for transport
44 zones). Based on the predictive assessment/modeling (described in PE SV Section
45 7A.1.2), about 65% to 95% of the potentially mobile peat generated from all bays
46 (Zones) will remain in the bay of origin. Further, it should be noted that the amount of
47 mobile peat is not equally distributed amongst the bays and that Zones 11 and 12 are
48 expected to produce the highest amounts of mobile peat in all post-Project years.
49 However, approximately 95% of the mobile peat generated within these two zones is
50 expected to be retained. The smaller Zones on the north side of the reservoir produce
51 less mobile peat but have a higher loss of mobile peat. The bays on the south side of
52 the reservoir generally accumulated more mobile peat because typical wind conditions
53 tend to move the mobile peat in that direction. Additionally, the analysis indicated less
54 than 10% of mobile peat, or about 1% of total peat load might move downstream of the
55 reservoir. As noted in the PE SV (Appendix 7A), the process of peat transport is complex
56 and not well understood, and no previous studies were identified that attempt to model
57 this physical process. This results in a high degree of uncertainty regarding the transport
58 of mobile peat.

59 The remainder of the peat loading (i.e., not floating), about 73% of the total load for
60 years 1-30, would be subject to settling. Testing of peat properties found that broken
61 down peat settles relatively quickly. For example, settling test results on 5 peat samples
62 found that more than 90% of the peat mass settled about 1.6 m/h (about 38 m/day) or
63 faster and more than 95% settled at a rate of almost 0.5 m/h (11 m/day) or faster, as
64 noted in technical memos GN 9.2.22 and GN 9.2.23 (listed in Response to EIS Guidelines
65 Appendix 6A).

66 The peatland disintegration analysis noted that more than 80% of disintegrated peat
67 originates in nearshore areas (within 150 m of shore). Also, more than 90% originates
68 from areas with a water depth of less than 3 m, largely because most of the peat load
69 originates from flooded bays where more than 63% of the area has a depth of less than
70 3 m (PE SV Section 6.4.2.1.6). In nearshore areas and particularly in flooded bays, water
71 velocities are typically low (see PE SV Maps 4.4-8 and 4.4-9).

72 Considering relatively quick settling rates in conjunction with shallow depths and low
73 flow velocities in flooded bays where most of the peat originates, it is anticipated that

74 most of the peat will settle near where it originates, as noted in (PE SV Section
75 7.4.2.3.3). There is the potential for some of this organic sediment to be transported out
76 of the bay in which it originates, however it is expected to be a small percentage of the
77 total organic loading based on the above considerations.



78
79 Figure 1: Mobile Peat Transport Zones (based on PE SV Map 7.2-3)

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 6.3.7.2**
 2 **Shoreline Erosion Processes, 6.3.8 Sedimentation (R to EIS);**
 3 **Executive Summary; Page No.: 23 (Exec Sum)**

4 **CEC Rd 2 CAC-0133**

5 **ORIGINAL PREAMBLE AND QUESTION (CAC-0050):**

6 While the EIS predicts that the magnitude of residual operation effects “associated with
 7 shoreline erosion processes” are expected to be large, subsequent discussions shift the
 8 emphasis to the observation that sediment loads will decrease rapidly over time,
 9 including the observation that “the overall amount of organic suspended sediment in
 10 the reservoir will be very low after the first few years of operation and will continue to
 11 be very low”. However, given that sediment loads will fall only after a year one increase
 12 in annual organic sediment that is 1300 times greater than the current annual figure,
 13 while 30 years after inundation (Year 30 being “considered a reasonable model for the
 14 long-term condition of the reservoir”) they will still be 18 times that of current annual
 15 levels, the above-quoted statement about decreasing sediment loads and future levels
 16 appears inaccurate.

17 Please provide more compelling evidence to validate the statement and prove its
 18 accuracy.

19 **FOLLOW-UP QUESTION:**

20 In reference to Lines 24-27 of your response, please explain why it is appropriate to
 21 provide figures for changes in average annual loadings relative to Year 1 rather than
 22 Year 0?

23 **RESPONSE:**

24 To provide context for the response to the follow-up question, lines 24-27 in the
 25 response to CEC Rd 1 CAC-0050 say: “Relative to Year 1, the average annual loadings are
 26 lower by approximately 75%, 95% and almost 99% in years 2-5, 6-15, and 16-30
 27 respectively (Table 1). It is these decreases that are noted as being a quick decline in
 28 organic loading relative to Year 1.”

29 It is uncertain what time frame the Information Request is referring to with the term
 30 “Year 0”, as that is not a time frame referenced in the EIS. In the EIS, “Year 1” includes
 31 the first year of the operating period. The figures provided in the response to CEC Rd 1
 32 CAC-0050 are intended to illustrate the changing nature of the peat loading to the
 33 reservoir during the operating period relative to the first year of operation, so the
 34 reference to Year 1 was appropriate for that comparison.

35 The intervener's reference to Year 0 is interpreted to mean the existing environment
36 period. Comparisons to Year 1 were made to illustrate the changing nature of the
37 Project effects during the operating period relative to the first year of operation. A
38 comparison to existing environment conditions would not illustrate how the effect
39 varies over time during operation. The Physical Environment Supporting Volume does
40 compare the predicted average annual rates of peat loading to the reservoir with the
41 Project to expected peat loading without the Project (Section 6.4.2.1.6; Table 6.4-3;
42 Figures 6.4-6 and 6.4-7; Table 6.4-4 Residual Effects). The differences in loading without
43 and with the Project were also noted in the response to CEC Rd 1 CAC-0050.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: PE SV;**
2 **AQ SV; YFFN Environmental Evaluation Report; FLCN**
3 **Environmental Evaluation Report; R to EIS 6.2.3.2.1 Physical**
4 **Environment ; Page No.: N/A**

5 **CEC Rd 2 CAC-0134**

6 **ORIGINAL PREAMBLE AND QUESTION (CAC-0051a):**

7 Given the complex interactions that link shoreline erosion processes, organic and
8 mineral sedimentation, debris, surface water temperature and dissolved oxygen, water
9 quality and their individual and cumulative impact on human health and aquatic life,
10 please provide the rationale for an environmental assessment that tackles each of these
11 as separate components.

12 **FOLLOW-UP QUESTION:**

13 The response contains extensive references to integration. Integration is generally
14 understood to mean “the combining and coordinating of separate parts or elements
15 into a unified whole”.

16 Integration, as referred to, appears to revolve around the sharing and presenting of
17 information and methods among the different study teams. While individual study
18 teams may have benefited from data collected by other teams, integrated methods and
19 data in this way, the EIS still presents these studies as separate sections.

20 There was clearly communication between the technical science assessment process
21 (including reports) and the KCN evaluation process/reports but integration appears to
22 be limited given the decision for the Partners to carry out and present their own
23 environmental evaluations.

- 24 · To what degree does the integration spoken about in your response refer to just the
25 technical science assessment process (including reports) versus integration between
26 the technical science assessment process (including reports) and the KCN evaluation
27 process/reports?
28 · In terms of the technical science assessment process (including reports) and the KCN
29 evaluation process/reports, is it accurate to say that the assessment of changes to
30 the physical environment resulting from the Project was addressed in a “highly
31 integrated manner”?

32 **RESPONSE:**

33 The response to CEC Rd 1 CAC-0051a was given with respect to the complex interactions
34 among the technical specialists working on the shoreline erosion processes,

35 sedimentation, debris, etc. and responded to the question which asked whether these
36 interactions were addressed separately. The Response explained that the technical
37 specialists interacted extensively while carrying out their studies such that the
38 assessment of the physical environment was conducted in a highly integrated manner,
39 as stated in Section 1.4 of the PE SV.

40 Please also see the responses to CEC Rd 2 CAC-0135 and CEC Rd 2 CAC-0140.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: PE SV;**
 2 **AQ SV; YFFN Environmental Evaluation Report; FLCN**
 3 **Environmental Evaluation Report; R to EIS 6.2.3.2.1 Physical**
 4 **Environment ; Page No.: N/A**

5 **CEC Rd 2 CAC-0135**

6 **ORIGINAL PREAMBLE AND QUESTION (CAC-0051c):**

7 Original IR: CAC-0051c Original Question: Please include information about the extent of
 8 communication and collaboration between the different teams of specialists who
 9 prepared the reports for each of these areas.

10 **FOLLOW-UP QUESTION:**

11 It is stated that the team “met regularly during the development of the EIS” and that “all
 12 these activities resulted in a highly collaborative, interdisciplinary approach to the
 13 assessment of effects to the physical environment”.

- 14 · Was that collaboration equally as high among Hydro staff and study team specialists
 15 as it was among these individuals and KCN representatives?
- 16 · Please compare the number of meetings amongst the Keeyask Physical Environment
 17 Coordination Team as compared to the number of meetings among these
 18 individuals and the KCN representatives.

19 **RESPONSE:**

20 CEC Rd 1 CEC-0051c requested information about the extent of communication and
 21 collaboration between the different teams of specialists who prepared the reports for
 22 each of these areas. The Response explained the approach and gave several examples of
 23 how the teams of specialists collaborated. The approach involved extensive progressive
 24 discussion of methods, results, information needs, etc.

25 Communication with the KCNs with respect to physical environment studies was
 26 undertaken within the context of the joint oversight of the preparation of the
 27 environmental assessment, as described in the JKDA (Schedule 3-1 Environmental and
 28 Regulatory Protocol). In addition to these broader mechanisms (e.g., Partners
 29 Regulatory and Licensing Committee, EIS Coordination Team), the approach to the
 30 physical environment studies, including review of annual fieldwork plans and progress,
 31 were shared with the KCNs through regular Environmental Studies Working Group
 32 meetings. When preliminary analyses developed initial results, these were shared with
 33 KCNs representatives in meetings; the draft supporting volume was also provided for
 34 review and comment by all of the KCNs and review and approve by the CNP. Due to the

35 nature of the approach, there were more meetings between the technical specialists
36 than there were with KCN representatives, just as the KCNs would have had more
37 meetings among themselves than with the technical specialists. Similarly, since the
38 purpose of the Keeyask Physical Environment Coordination Team was to coordinate the
39 physical environment technical studies being undertaken by the technical specialists,
40 the team necessarily met more frequently among its members than it did with the KCNs.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section:**
 2 **6.4.2.1.5 Peat Resurfacing and Floating Peat Mat Mobility, 7.1.1.2**
 3 **Peat Sedimentation, 10.4.2.1 Debris due to Reservoir Expansion**
 4 **(PE SV); 6.2.3.2.11 Debris, 6.3.8.2 Sedimentation, 6.3.11 Debris (R**
 5 **to EIS); 3.2 Keeyask Forebay Clearing Plan Draft 2006 ; Page No.:**
 6 **N/A**

7 **CEC Rd 2 CAC-0136a**

8 **ORIGINAL PREAMBLE AND QUESTION (CAC-0052b):**

9 Peat-lands make up a significant portion of the 45km² area that will be cleared and then
 10 flooded by the Project. Reservoir impoundment is predicted to expand by a further 7-8
 11 km² over the first three decades due to shoreline erosion, leading to more peat-land
 12 disintegration and break-up.

13 Even at the lower estimate, this still suggests the equivalent of 5-10km² of peat
 14 resurfacing as debris. If this is considered small in magnitude, what amounts of peat
 15 debris would have to be seen in order to be considered medium or large in magnitude?
 16 Do these figures account for areas beyond the initial impoundment (159 masl) at risk to
 17 erosion and peatland disintegration after flooding?

18 **FOLLOW-UP QUESTION:**

19 Peat debris is considered small in magnitude – based on predictions of 2.7km² of mobile
 20 peat for Year 1, 0.7km² for Years 2-5, and 0.2km² for years 6-15. If the above amounts
 21 are considered to be small in magnitude, please state what amounts of mobile peat
 22 would need to be seen in order to be considered medium and large in magnitude
 23 respectively?

24 **RESPONSE:**

25 The response to CEC Rd 1 CAC-0052b was imprecise in that it did not explain that the
 26 mass and size of mobile peat is not assessed as small in magnitude. Rather, the
 27 magnitude is assessed in terms of the anticipated effects of large woody debris and
 28 floating peat, including mobile peat, on navigation safety, resource use and generating
 29 station operation within the context of planned mitigation. Through the implementation
 30 of planned mitigation under the Reservoir Clearing Plan and the Waterways
 31 Management Program (JKDA Schedules 11-1 and 11-2; Response to EIS Guidelines
 32 Appendices 4A and 4B), it is expected that the potential impacts of debris will be
 33 mitigated so that the magnitude of residual effects on navigation safety, resource use
 34 and generating station operation are small.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section:**
 2 **6.4.2.1.5 Peat Resurfacing and Floating Peat Mat Mobility, 7.1.1.2**
 3 **Peat Sedimentation, 10.4.2.1 Debris due to Reservoir Expansion**
 4 **(PE SV); 6.2.3.2.11 Debris, 6.3.8.2 Sedimentation, 6.3.11 Debris (R**
 5 **to EIS); 3.2 Keeyask Forebay Clearing Plan Draft 2006; Page No.:**
 6 **N/A**

7 **CEC Rd 2 CAC-0136b**

8 **ORIGINAL PREAMBLE AND QUESTION (CAC-0052b):**

9 Peat-lands make up a significant portion of the 45km² area that will be cleared and then
 10 flooded by the Project. Reservoir impoundment is predicted to expand by a further 7-8
 11 km² over the first three decades due to shoreline erosion, leading to more peat-land
 12 disintegration and break-up.

13 Even at the lower estimate, this still suggests the equivalent of 5-10km² of peat
 14 resurfacing as debris. If this is considered small in magnitude, what amounts of peat
 15 debris would have to be seen in order to be considered medium or large in magnitude?
 16 Do these figures account for areas beyond the initial impoundment (159 masl) at risk to
 17 erosion and peatland disintegration after flooding?

18 **FOLLOW-UP QUESTION:**

19 In lines 41-46 of the response, your definition of debris appears to cover only peat that
 20 is both mobile and in an area that impedes safe navigation.

- 21 · Is this correct, or can we understand any resurfaced peat that is mobile to be
 22 considered debris, irrespective of its location, which appears to be the definition
 23 touted in lines 25-27 of the response?
- 24 · What fraction of the peat that is potentially mobile will become debris that may
 25 need to be dealt with? Everything less than the whole is a fraction so this needs to
 26 be specified in order to quantify the amount that will be needed to be cleared.
- 27 · In clarifying the above, please reconsider and comment on the statement made in
 28 Line 48 of the response that it "is not possible to reasonably determine how much
 29 (debris) will need to be dealt with? Can you confirm that all resurfaced peat (no
 30 matter the size) considered immobile (i.e. cannot be transported by wind and/or
 31 currents) poses no hazard to navigation?

32 **RESPONSE:**

33 Each of the above questions is answered in turn below.

34 1. *In lines 41-46 of the response, your definition of debris appears to cover only peat*
 35 *that is both mobile and in an area that impedes safe navigation? Is this correct, or*
 36 *can we understand any resurfaced peat that is mobile to be considered debris,*
 37 *irrespective of its location, which appears to be the definition touted in lines 25-27 of*
 38 *the response?*

39 All mobile peat could be considered as potential debris since it has the potential to be
 40 transported into the waterway. However, as noted in the response to CEC Rd 1 CAC-
 41 0052b, it is anticipated that some mobile peat will not need to be removed because it
 42 will subsequently become immobilized (see response 3 below for further discussion), or
 43 it may be located in areas where it is less likely to be moved into the waterway and is
 44 not impeding travel routes. The main navigation routes and landing sites, which will be
 45 identified as part of the Waterways Management Program (JKDA Schedule 11-2;
 46 Response to EIS Guidelines Appendix 4B), will be a priority for debris removal. As part of
 47 the Program, the areas in which debris is present or accumulating will be identified so
 48 that debris management activities may be prioritized to focus on areas more likely to
 49 cause debris that may move into the waterway and impede safe navigation.

50 2. *What fraction of the peat that is potentially mobile will become debris that may*
 51 *need to be dealt with? Everything less than the whole is a fraction so this needs to be*
 52 *specified in order to quantify the amount that will be needed to be cleared. In*
 53 *clarifying the above, please reconsider and comment on the statement made in Line*
 54 *48 of the response that it "is not possible to reasonably determine how much*
 55 *(debris) will need to be dealt with"?*

56 As indicated in the original response to CEC Rd 1 CAC-0052b, it is not possible to identify
 57 the specific amount or fraction of mobile peat that will need to be displaced or
 58 removed. Recognizing that the amount of debris that will need to be addressed is not
 59 specifically defined, the Waterways Management Program commits to a larger
 60 workforce in the early years of operation when greater amounts of debris are
 61 anticipated so that the available resources will be able to fulfil the objectives of the
 62 Waterways Management Program.

63 3. *Can you confirm that all resurfaced peat (no matter the size) considered immobile*
 64 *(i.e. cannot be transported by wind and/or currents) poses no hazard to navigation?*

65 It would not be accurate to characterize all immobile peat as not posing a hazard to
 66 navigation. While it is anticipated that most immobile peat would not represent a
 67 hazard to navigation because it is expected to accumulate in shallow back bay areas away
 68 from navigation routes, there may be situations where it is considered a hazard. For
 69 example, if immobilized peat impedes navigation to a safe landing site, then the peat
 70 may need to be managed to maintain safe access. As noted in the response to the first

- 71 question above, the Waterways Management Program will include identifying areas of
72 debris accumulation and prioritizing debris management activities, which could include
73 identifying areas for proactive debris management on a case-by-case basis.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section:**
 2 **6.4.2.1.5 Peat Resurfacing and Floating Peat Mat Mobility, 7.1.1.2**
 3 **Peat Sedimentation, 10.4.2.1 Debris due to Reservoir Expansion**
 4 **(PE SV); 6.2.3.2.11 Debris, 6.3.8.2 Sedimentation, 6.3.11 Debris (R**
 5 **to EIS); 3.2 Keeyask Forebay Clearing Plan Draft 2006 ; Page No.:**
 6 **N/A**

7 **CEC Rd 2 CAC-0137**

8 **ORIGINAL PREAMBLE AND QUESTION (CAC-0052c):**

9 Peat-lands make up a significant portion of the 45km² area that will be cleared and then
 10 flooded by the Project. Reservoir impoundment is predicted to expand by a further 7-8
 11 km² over the first three decades due to shoreline erosion, leading to more peat-land
 12 disintegration and break-up.

13 In light of the above, and given how variability in debris amounts can be increased due
 14 to fluctuations in water flow and levels, as well as variable ice conditions, please provide
 15 information about the capacity of the Waterways Management Program to cope with
 16 the removal of peat mats/blocks/islands etc. (in addition to woody debris) if levels are
 17 higher than expected, and given the current context where “minor amounts of organic
 18 sediment and floating peat are generated”. In particular, how is the Program expected
 19 to deal with the fact that two-thirds of peat break-up and resurface is expected to
 20 happen in the first year? Similarly, how does the Program plan to manage debris
 21 removal adaptively given the uncertainty about how much debris may be mobile at any
 22 one time since it can go through “many cycles of being mobilized and immobilized as
 23 conditions on the waterway change over time”? On this issue, please provide evidence
 24 that supports the claim that “there is not expected to be any additional mobile peat
 25 after 15 years of operation”. One scientific report (Keeyask Forebay Clearing Plan) states
 26 that there is “uncertainty regarding the full extent and rate of peatland disintegration
 27 and erosion. It is also impossible at this time to predict annual clearing requirements as
 28 numerous variables will affect the extent and rate of peatland disintegration and
 29 erosion from year to year”. What guarantees are there that those requirements can be
 30 met?

31 **FOLLOW-UP QUESTION:**

32 In Line 44 of the response, it is stated that the “Program commits to having a large crew
 33 of up to 25 people on the reservoir during the first three to five years”. What
 34 considerations will be employed in determining whether it will be three or four or five
 35 years? How many boats would this involve in total? Do any of the 25 people stated
 36 include maintenance crew or would all 25 be on the reservoir clearing debris?

37 **RESPONSE:**

38 Each of the above questions is answered, in turn, below:

39 1. *What considerations will be employed in determining whether it will be three or four*
40 *or five years?*

41 The duration will be determined based on the level of effort required to implement
42 program activities to meet the objectives of the Waterways Management Program.

43 2. *How many boats would this involve in total?*

44 As stated in Section 4.3 of the Waterways Management Program, "a crew of up to
45 twenty-five (25) workers, configured as two (2) primary boat patrols and three (3)
46 supplementary work crews, will operate five (5) multi-purpose boats."

47 3. *Do any of the 25 people stated include maintenance crew or would all 25 be on the*
48 *reservoir clearing debris?*

49 Section 4 of the Waterways Management Program ("Program Activities") lists the
50 activities that will be undertaken by the Waterways Management Program employees
51 pre and post-impoundment. These activities include debris removal, as well as activities
52 such as certain safety initiatives and work related to protection of heritage sites.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section:**
 2 **6.4.2.1.5 Peat Resurfacing and Floating Peat Mat Mobility, 7.1.1.2**
 3 **Peat Sedimentation, 10.4.2.1 Debris due to Reservoir Expansion**
 4 **(PE SV); 6.2.3.2.11 Debris, 6.3.8.2 Sedimentation, 6.3.11 Debris (R**
 5 **to EIS); 3.2 Keeyask Forebay Clearing Plan Draft 2006 ; Page No.:**
 6 **N/A**

7 **CEC Rd 2 CAC-0138a**

8 **ORIGINAL PREAMBLE AND QUESTION (CAC-0052d):**

9 Peat-lands make up a significant portion of the 45km² area that will be cleared and then
 10 flooded by the Project. Reservoir impoundment is predicted to expand by a further 7-8
 11 km² over the first three decades due to shoreline erosion, leading to more peat-land
 12 disintegration and break-up.

13 Lastly, please provide an estimate of the number of pieces of woody debris expected on
 14 an annual basis for years 1 through 30 post-inundation (following the report that
 15 between 2002 and 2008, the Program removed between 13 to 177 pieces per year). If
 16 the range is expected to be significantly higher than this, what measures will be taken to
 17 ensure the capacity of the Program to cope with such an increase?

18 **FOLLOW-UP QUESTION:**

19 In Lines 20-23 of the response, it is stated that “there is no reasonable means to
 20 estimate the number of pieces of debris that will need to be removed each year during
 21 Keeyask operation, nor the degree to which it may or may not exceed the amounts of
 22 debris removed in the past”. Given this reality, how did the Partnership calculate the
 23 human and monetary resources that would be needed by the Waterways Management
 24 Program?

25 **RESPONSE:**

26 As there is no definitive, reliable way to estimate the amount of debris that will need to
 27 be removed each year, the Partnership relied on the past experiences of Manitoba
 28 Hydro and the KCN to estimate the human and monetary resources that will be needed
 29 for the Waterways Management Program. In the event that the level of debris exceeds
 30 the capacity of the Waterways Management Program, the Partnership will review and
 31 adapt the program as required.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section:**
 2 **6.4.2.1.5 Peat Resurfacing and Floating Peat Mat Mobility, 7.1.1.2**
 3 **Peat Sedimentation, 10.4.2.1 Debris due to Reservoir Expansion**
 4 **(PE SV); 6.2.3.2.11 Debris, 6.3.8.2 Sedimentation, 6.3.11 Debris (R**
 5 **to EIS); 3.2 Keeyask Forebay Clearing Plan Draft 2006; Page No.:**
 6 **N/A**

7 **CEC Rd 2 CAC-0138b**

8 **ORIGINAL PREAMBLE AND QUESTION (CAC-0052d):**

9 Peat-lands make up a significant portion of the 45km² area that will be cleared and then
 10 flooded by the Project. Reservoir impoundment is predicted to expand by a further 7-8
 11 km² over the first three decades due to shoreline erosion, leading to more peat-land
 12 disintegration and break-up.

13 Lastly, please provide an estimate of the number of pieces of woody debris expected on
 14 an annual basis for years 1 through 30 post-inundation (following the report that
 15 between 2002 and 2008, the Program removed between 13 to 177 pieces per year). If
 16 the range is expected to be significantly higher than this, what measures will be taken to
 17 ensure the capacity of the Program to cope with such an increase?

18 **FOLLOW-UP QUESTION:**

19 It was stated that “once per-week trips by a two-person boat patrol crew” was
 20 responsible for picking up pieces of woody debris between 2002 and 2008. Does this
 21 cover all the pieces of woody debris that needed to be removed or, rather, was this the
 22 amount that these crews were able to remove in the time allotted to them (i.e. not all
 23 woody debris that needed to be removed were removed)?

24 **RESPONSE:**

25 To the extent practicable crews remove all hazardous woody debris that could pose a
 26 risk to safe use of the waterway. Once per-week trips were deemed to be sufficient to
 27 manage debris during that time period based on the amount of debris observed and
 28 collected. If the amount of woody debris had been greater the frequency of patrols
 29 would have been increased. There are two components to the process: removal and
 30 monitoring. The debris is removed and then the debris information is recorded using
 31 GPS technology and downloaded into a database. Adjustments related to removal and
 32 monitoring are then made based on the information that is gathered.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: .3.3.1**
 2 **and 6.3.3.2 Climate (R to EIS); 2.4.1 Effect of the Project on Climate**
 3 **Change; EIS Executive Summary 2012:42; Technical Memorandum**
 4 **GN-9.5.5 (A Life Cycle Assessment of Greenhouse Gases and Select**
 5 **Criteria Air Contaminants) 2012 ; Page No.: N/A**

6 **CEC Rd 2 CAC-0139**

7 **ORIGINAL PREAMBLE AND QUESTION:**

8 Consistent with federal and provincial government efforts to reduce GHG emissions, the
 9 EIS states that the Project will “significantly displace coal-or-gas generated electricity
 10 that could produce over 200-times more greenhouse gas” and “while the construction
 11 and operation of the Project will result in short, small increases in regional GHG
 12 emissions, the operation of the Project will result in large reductions regionally over the
 13 long-term”.

14 Do the Project Partners expect peat breakup in some areas to be offset by peat
 15 formation in others? If so, please provide details. Does the Project classify peat as a
 16 renewable biomass? How long does Hydro estimate it takes for peat to reaccumulate
 17 (convert to new peatland types) in the Local and Regional Stud Areas post-
 18 impoundment?

19 **FOLLOW-UP QUESTION:**

20 Does the Partnership classify peat in the Local Study Area as a renewable biomass? (This
 21 is in response to the response given in Lines 31-32 of the response, which fail to specify
 22 the Partnership’s views)

23 **RESPONSE:**

24 The response given in lines 31-32 (CEC Rd 1 CAC-0053b) stated that “Peat can be
 25 classified as a renewable biomass because it is produced over periods ranging from
 26 months to years, depending on the type of peat and local conditions.” On this basis,
 27 peat that develops over periods ranging from months to years is classified as renewable
 28 biomass.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section:**
2 **Executive Summary; 6.0 Environment Effects Assessment ; Page**
3 **No.: 6, 33 (Exec Sum)**

4 **CEC Rd 2 CAC-0140**

5 **ORIGINAL PREAMBLE AND QUESTION (CAC-0054):**

- 6 · Please provide evidence to show how the regulatory test for significance (of residual
7 adverse effects) for the 38 VECs, a test that lies at the heart of the Keeyask
8 environmental assessment process, provides “equal consideration to both technical
9 scientific studies and ATK [...] creating a thorough and comprehensive planning and
10 environmental assessment process”.
- 11 · Specifically, explain how the assessment process, as well as the negotiations and
12 discussions that took place between the Partners, supports the claim of an
13 “integrated and collaborative approach”. Please stipulate the nature and extent of
14 this “integration” (i.e. provide concrete examples across all aspects of the
15 assessment process, as well as mitigation and adaptive management strategies).
16 Please also describe the nature and extent of the efforts made to bridge the gap
17 between what the regulations required and their synergy (or lack thereof) with the
18 beliefs and views of the KCN partners?

19 **FOLLOW-UP QUESTION:**

20 Lines 37-38 of the response make reference to the Executive Summary of the EIS,
21 specifically where it states, “these two separate evaluations as an integrated and
22 collaborative approach”. Further, in Lines 21-23 of the response under CAC-0060, it is
23 stressed that “two separate types of evaluations” were carried out by “different authors
24 for different purposes”.

- 25 · In light of the above, and with reference to the preamble and questions found under
26 CEC Rd 1 CAC-0051a, please explain how the strategy of two separate evaluations
27 functioned as a collaborative and integrated assessment process? In particular,
28 please describe in what ways the two separate evaluations were “integrated”?

29 **RESPONSE:**

30 As set out in the Response to EIS Guidelines and the Executive Summary, two separate
31 environmental evaluations were conducted as described and, given the rationale for
32 having these two separate evaluations, no attempt was made to “integrate” them. This
33 was also highlighted in the response to CEC Rd 1 CAC-54 at lines 42 to 44, and lines 53 to
34 58.

35 The Executive Summary at page 6 refers to the broader process of how the Partners
36 worked together in assessing and developing the Project as "an integrated and
37 collaborative approach". This was also highlighted in the response to CEC Rd 1 CAC-54 at
38 lines 45 to 52, and lines 59 to 66.

39 The question references CEC Rd 1 CAC –0051a, which pertains to the physical
40 environment studies. The process regarding the physical environment was described in
41 CEC Rd 1 CAC-0101 and is repeated here.

42 "The Partnership, comprised of Manitoba Hydro and the Keeyask Cree Nations (KCNs),
43 agreed to utilize a two-track approach to assess the effects of the Keeyask Generation
44 Project (Keeyask). One track of the assessment involved the KCNs assessing the effects
45 of the Project on themselves based on their 50 years of experience with hydroelectric
46 development and their own distinctive Cree worldview (see KCNs Environmental
47 Evaluation Reports). The other assessment track, led by the Partnership, assessed the
48 effects of the Project in terms of regulatory significance, within the context of, and
49 consistent with Federal and Provincial requirements (see Preface to the Response to EIS
50 Guidelines).

51 Both the KCNs Environmental Evaluation Reports and the Partnership's Response to EIS
52 Guidelines make reference to Aboriginal Traditional Knowledge (ATK). For the purposes
53 of the regulatory assessment, the Partnership uses the term ATK in a more limited form,
54 primarily in relation to the information gathered and applied from working with First
55 Nations' people.

56 In the case of the KCNs, ATK and the Cree worldview are inseparable and
57 complementary components of their way of life and, ultimately, are the foundation of
58 their assessment of the Project. Although ATK encompasses knowledge of local
59 ecosystems and the surrounding physical environment it is a much more complex
60 concept. It is a holistic understanding of the world which is based on sustaining vital
61 relationships with Mother Earth, or *Askíy*, such as spiritual, historical, educational, social
62 and life-sustaining relationships. These relationships, in turn, are the basis of Cree
63 language, history and spirituality – cumulatively, the Cree culture. The basis of the Cree
64 worldview is described in the each KCNs Keeyask Environmental Evaluation Reports and
65 Section 2.0 of the Keeyask EIS – Response to EIS Guidelines.

66 ATK that is discussed in Chapter 6 of the Response to EIS Guidelines and in the Technical
67 Supporting Volumes is sourced either to the evaluation reports prepared by the CNP,
68 YFFN and FLCN, or to Chapter 2 of the Response to EIS Guidelines document. Chapter 2
69 includes sections individually authored by CNP, YFFN and FLCN. In addition, Chapter 2
70 also includes a consensus Cree worldview statement. "...Elders and leadership of the
71 KCNs came together to arrive at a consensus on a common understanding and

72 statement of their Cree worldview and values” (Section 6.6.2, p 6-427). It should be
 73 noted that beyond the description of effects specific to each component set out in
 74 Section 6, the KCNs’ ATK was brought into the Project planning and environmental
 75 assessment process, including the assessment of effects on the environment, through
 76 several joint processes that are described below.

77 For a discussion on ATK with regard to the Physical Environment, see Section 6.3.2 in the
 78 Response to EIS Guidelines.

79 The assessment of effects on the environment took place within the context of a Project
 80 planning and assessment process undertaken in partnership, and in a manner that
 81 sought to involve the KCNs in joint planning and oversight. As set out in Schedule 3.1 of
 82 the Joint Keeyask Development Agreement, a series of joint management structures
 83 were established that included participation of KCNs and Manitoba Hydro. Through
 84 KCNs involvement, their ATK was brought into the Project Planning and Environmental
 85 Assessment process, and contributed to the following aspects of the environmental
 86 assessment:

- 87 • Identification of concerns and issues about the proposed Project to be addressed in
 88 the environmental assessment;
- 89 • Inclusion of the KCNs’ experiences with past hydroelectric development that helped
 90 guide field studies as well as assessment of effects;
- 91 • Development of the two-track assessment process (see Preface of Response to EIS
 92 Guidelines);
- 93 • Through bilateral environmental studies working groups with each of the KCNs,
 94 review and revision of annual field work plans for the assessment studies and
 95 extensive participation in these studies as field assistants;
- 96 • Special topic multilateral working groups to address key issues: the Aquatics
 97 Working Group, the Terrestrial Working Group and the Mercury and Human Health
 98 Technical Working Group;
- 99 • Overall guidance on the EIS filing through the Partners Regulatory and Licensing
 100 Committee and the EIS Coordination Team;
- 101 • Shaping of the structure of the EIS filing and how ATK would be included in the filing
 102 – under the direction of the EIS Coordination Team, a working group focused on
 103 establishing ATK principles to guide how ATK would be incorporated into the
 104 process (see Chapter 2, Appendix 2A);
- 105 • Review of annotated outlines for each of the chapters of the Response to the EIS
 106 Guidelines document;
- 107 • Review of initial results of the environmental assessment, as well as discussion and
 108 consideration of mitigation and monitoring measures;
- 109 • Review and comment on environmental protection and monitoring plans; and

110 · Review, comment (and approval in the case of CNP) of the text of each chapter of
111 the Response to the EIS Guidelines document as well as supporting volumes.

112 ATK data, direct observation or technical knowledge of the physical environment were
113 considered. Where ATK observations and perspectives identified concerns or where
114 there was uncertainty regarding Project effects on the physical environment, the
115 concerns were addressed through detailed consideration of these effects as discussed in
116 each section of the Physical Environment Supporting Volume in the Response to EIS
117 Guidelines. The draft Physical Environment Monitoring Plan, which was reviewed by the
118 KCNs and filed with regulators on June 28, 2013, identifies physical environment
119 monitoring activities that will measure effects of concern to the KCNs.”

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: YFFN**
 2 **Environmental Evaluation Report; FLCN Environmental**
 3 **Evaluation Report; Page No.: 18 (FLCN)**

4 **CEC Rd 2 CAC-0141**

5 **ORIGINAL PREAMBLE AND QUESTION (CAC-0055a):**

6 For some among the KCN Partners, the VEC process was very difficult to accept, given
 7 that its very nature "ignores the interrelatedness of people, animals, water, landscape
 8 and plants". Please describe and provide details about the extent and nature of
 9 discussions held between Manitoba Hydro and the KCNs with regards to the selection of
 10 the VECs and/or the modification of selected VECs in order to reflect the Cree
 11 Worldview, and specifically the interrelatedness of people, animals, water landscape
 12 and plants. What was the outcome of these discussions?

13 **FOLLOW-UP QUESTION:**

14 Lines 32-36 of the response note that "in 2008, the Partnership held two major
 15 workshops with representation from the KCNs and Manitoba Hydro to review and
 16 discuss the concept of VECs and the proposed scope of VECs used in the environmental
 17 assessment". Please provide the dates, duration, names of attendees (and affiliation),
 18 and agendas for these workshops, and notes if available.

19 **RESPONSE:**

20 The first workshop on VECs was held June 19, 2008. The workshop was an all-day
 21 meeting (9:30am to 4:30pm) with representatives from the Cree Nation Partners, York
 22 Factory First Nation, Fox Lake Cree Nation, Manitoba Hydro and the environmental
 23 assessment team.

24 The second workshop on VECs was held on September 17 and 18th, 2008 and was
 25 comprised of two all-day meetings (9:30am to 4:30pm) with representatives from the
 26 Cree Nation Partners, York Factory First Nation, Fox Lake Cree Nation, Manitoba Hydro
 27 and the environmental assessment team.

28 The names of attendees, agendas and meeting notes are considered confidential by the
 29 Partnership and will not be provided.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: YFFN**
2 **Environmental Evaluation Report; FLCN Environmental**
3 **Evaluation Report; Page No.: 18 (FLCN)**

4 **CEC Rd 2 CAC-0142**

5 **ORIGINAL PREAMBLE AND QUESTION (CAC-0055b):**

6 Similarly, did any discussions take place between Manitoba Hydro and the four KCNs
7 about making 'value' a designation of significance (in addition to those of 'nature',
8 'magnitude', 'geographical extent' and 'duration'), in order to better reflect Cree
9 perspectives of the Keeyask homeland ecosystem (as stated in the respective
10 environmental evaluation reports)? If these did take place, what was the nature and
11 outcome of the discussions and what efforts made to modify the assessment process
12 and test criteria in order to integrate Cree perspectives?

13 **FOLLOW-UP QUESTION:**

14 In Lines 24-29 of the Rd 1 response, you state that "the Partnership did not consider
15 making 'value' a criterion for designation of significance" because "regulatory guidance
16 is clear that the determination of regulatory significance... must be limited to questions
17 related to scientific analysis and interpretation".

18 Given that the EIS is based on a collaborative and integrated assessment process, with
19 equal consideration given to technical scientific studies and ATK, do you consider the
20 regulatory framework adequate given its inability to include 'value' as a criterion for
21 designation of significance.

22 **RESPONSE:**

23 As stated in the response to CEC Rd 1 CAC-0055b, the Partnership followed regulatory
24 guidance in the determination of regulatory significance regarding effects of the Project
25 on a VEC. The Partnership does not feel that its role in this process is to comment on
26 the adequacy of the regulatory framework.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: YFFN**
2 **Our Voices Report 2012; FLCN Environmental Evaluation Report**
3 **2012; Response to EIS Guidelines, Chapter 6. ; Page No.: N/A**

4 **CEC Rd 2 CAC-0143**

5 **ORIGINAL PREAMBLE AND QUESTION (CAC-0056):**

6 Please provide information about the nature and extent of discussions between the
7 Project Partners about the use of biodiversity offsetting as a principle mitigation tool.
8 Specifically, did any of the Partners question whether biodiversity offsetting was
9 consistent with a Cree Worldview, given that it circumvents the role that 'place' plays in
10 the homeland ecosystem? If concerns were raised, how were these resolved?

11 **FOLLOW-UP QUESTION:**

12 Biodiversity offsetting was not applied by the Partnership as a principal mitigation tool
13 for the Keeyask Generation Project, and none of the Partners discussed whether
14 biodiversity offsetting was consistent with a Cree Worldview. Is biodiversity offsetting
15 being used by the Partnership in any form as a mitigation tool?

16 **RESPONSE:**

17 As noted in the response to CEC Rd 1 CAC-0056, the Partnership did not apply the
18 biodiversity offsetting conceptual approach. The approach adopted by the Partnership is
19 reviewed in CEC Rd 1 CAC-0056. In brief, the approach to mitigation was sequential
20 using the following steps: minimize the size of the Project Footprint; avoid sensitive
21 sites; mitigate in the Local Study Area for effects where additional mitigation is needed;
22 and, mitigate outside the Local Study Area for situations where other mitigation is
23 needed. This approach to reducing effects on biodiversity to regionally acceptable levels
24 is commonly found in Canadian environmental assessments, and is consistent with the
25 guidelines issued by regulatory authorities and standard environmental assessment
26 methodology.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: CAC-**
 2 **0057-YFFN Our Voices Report 2012:71; FLCN Environmental**
 3 **Evaluation Report 2012:35; YFFN Our Voices Report 2012:69-94;**
 4 **Response to EIS Guidelines, Chapter 8. CEC-0035-N/A; Page No.:**
 5 **N/A**

6 **CEC Rd 2 CAC-0144a**

7 **ORIGINAL PREAMBLE AND QUESTION (CAC-0057):**

8 The Project is located in a region that has been greatly altered over the past five to six
 9 decades by development of the Lake Winnipeg Regulation Project (LWR), the Churchill
 10 River Diversion Project (CRD) and five generating stations. When KCN members spoke
 11 about Keeyask, many took the view that Keeyask is simply a continuation of one large
 12 development project, with their evaluation reports all detailing the impacts that
 13 previous Hydro developments have had on their homeland ecosystems and way of life.
 14 The EIS makes clear that the monitoring of changes and impacts will be measured
 15 against current conditions (i.e. prior to construction and operation of the Keeyask Dam
 16 and Generating Station). This is not consistent with the views of members of at least
 17 two of the KCNs, who believe that baseline conditions should be those that existed prior
 18 to the construction of the first dam in the region in the late 1950s.

19 Please respond to the difference in viewpoint between Manitoba Hydro and the KCN
 20 Partners around the issue of baseline data. If discussions took place between the
 21 Partners about this apparent discrepancy, please provide information about the nature
 22 and outcome of those discussions, and explain how collaborative monitoring is expected
 23 to function successfully in light of these differences - for "situations where ATK and
 24 technical assessments differ" how will monitoring be carried out and decisions made if
 25 the KCNs and Manitoba Hydro are working off of different sets of baseline data?

26 **FOLLOW-UP QUESTION:**

27 In Lines 29-31 of your response, it is stated that "on the matter of monitoring, there is
 28 no difference in viewpoint between Manitoba Hydro and the KCN Partners around the
 29 issue of baseline data, i.e., the data against which changes will be measured after the
 30 Project is developed". In the Fox Lake Evaluation Report, and as highlighted in CEC Rd 1
 31 CEC-0035, it is stated that "Our people define baseline as the condition of the land,
 32 waters and people prior to hydroelectric development which began in the early 1960s.
 33 This is in contrast to Manitoba Hydro's baseline defined as the existing condition of the
 34 terrestrial, aquatic, and socioeconomic environments".

35 Please reconcile the Hydro statement with the position taken in the Fox Lake Evaluation
36 Report.

37 **RESPONSE:**

38 As reviewed in the original response, the Partnership prepared and submitted the
39 Keeyask Response to EIS Guidelines to address the government regulatory assessment
40 process, which includes the proposed monitoring. Separately, each of the KCNs
41 conducted its own environmental evaluation process to evaluate the effects of the
42 Project on themselves from their own distinctive worldview.

43 As reviewed in the original response, the Partnership's proposed monitoring will be
44 conducted to determine what, if any, future changes occur to a VEC or other indicator
45 due to Project development and/or other factors, and to assess the accuracy of
46 predictions in the Project EIS and efficacy of mitigation measures. As such, the
47 "baseline" for this monitoring is current conditions and the expected trends in such
48 conditions without the Project.

49 The referenced Fox Lake Evaluation Report was the result of a separate process as
50 noted, and addressed the environmental evaluation process carried out by Fox Lake and
51 without reference to the monitoring measures proposed by the Partnership for Keeyask.
52 The comparable environmental evaluation process carried out by the Partnership in the
53 Response to EIS Guidelines in Chapters 6 and 7 also looked at the extent to which
54 existing conditions had been affected by prior developments.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: CAC-**
 2 **0057-YFFN Our Voices Report 2012:71; FLCN Environmental**
 3 **Evaluation Report 2012:35; YFFN Our Voices Report 2012:69-94;**
 4 **Response to EIS Guidelines, Chapter 8. CEC-0035-N/A; Page No.:**
 5 **N/A**

6 **CEC Rd 2 CAC-0144b**

7 **ORIGINAL PREAMBLE AND QUESTION (CAC-0057):**

8 The Project is located in a region that has been greatly altered over the past five to six
 9 decades by development of the Lake Winnipeg Regulation Project (LWR), the Churchill
 10 River Diversion Project (CRD) and five generating stations. When KCN members spoke
 11 about Keeyask, many took the view that Keeyask is simply a continuation of one large
 12 development project, with their evaluation reports all detailing the impacts that
 13 previous Hydro developments have had on their homeland ecosystems and way of life.
 14 The EIS makes clear that the monitoring of changes and impacts will be measured
 15 against current conditions (i.e. prior to construction and operation of the Keeyask Dam
 16 and Generating Station). This is not consistent with the views of members of at least
 17 two of the KCNs, who believe that baseline conditions should be those that existed prior
 18 to the construction of the first dam in the region in the late 1950s.

19 Please respond to the difference in viewpoint between Manitoba Hydro and the KCN
 20 Partners around the issue of baseline data. If discussions took place between the
 21 Partners about this apparent discrepancy, please provide information about the nature
 22 and outcome of those discussions, and explain how collaborative monitoring is expected
 23 to function successfully in light of these differences - for "situations where ATK and
 24 technical assessments differ" how will monitoring be carried out and decisions made if
 25 the KCNs and Manitoba Hydro are working off of different sets of baseline data?

26 In Lines 60-61 and Lines 67-68 of the response, it is noted that "given the differing
 27 worldviews, there are naturally some cases where the conclusions reached to date by
 28 these two evaluation processes are different" and that "in such cases, the Partnership
 29 has developed monitoring programs that respond to the concerns raised through both
 30 worldviews".

31 · Can you provide examples of how monitoring will respond to the concerns raised
 32 through both worldviews? Secondly, has monitoring been seen as the only way to
 33 respond when differences in opinion arise between a KCN evaluation and the
 34 corresponding technical science study?

- 35 · Are there instances where another type of response has been forthcoming? If so,
36 can you provide examples to illustrate the nature of that response?
37 · With reference to this IR, as well as those that refer to CAC-0054, CAC-0055a, CAC-
38 0055b, and CAC-0056, are representatives from the KCN Partners consulted to help
39 provide responses? If not, why not?

40 **RESPONSE:**

41 The original response provided an example of how monitoring will respond to the
42 concerns raised (copy provided below):

43 "For example, Tataskweyak Cree Nation and York Factory First Nation believe
44 that open water levels on Split Lake will be affected as a result of the Project; in
45 contrast, engineering studies and analysis indicate that open water levels on
46 Split Lake will not be affected – in fact, the requirement that these open water
47 levels will not be affected by the Project is a fundamental feature of the Project
48 in the Joint Keeyask Development Agreement."

49 The original question asked specifically and only about monitoring. The Partnership has
50 addressed concerns raised through both worldviews through many other aspects of the
51 process of working successfully together on the Project, including the design of the
52 Project and the approaches adopted for its development.

53 KCN representatives have been specifically consulted during the development of
54 responses to many of the Information Requests, including those referenced above. KCN
55 representatives also have the option of reviewing and providing comments on all of the
56 responses to Information Requests, based on their own interests and concerns.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: C.9-4,5**
 2 **and 11 ; Page No.: N/A**

3 **CEC Rd 2 CAC-0145**

4 **ORIGINAL PREAMBLE AND QUESTION (CAC-0066):**

5 **Rationale**

6 In several instances the project proponent outlines principles, policies, guidelines and
 7 goals for sustainable development that require enhancement of the natural
 8 environment, for which the proposed project is claimed to meet. Two examples are
 9 Goal 6 of Federal Sustainable Development Goals - Ecosystem / Habitat Conservation
 10 and Protection

11 *Goal* – Maintain productive and resilient ecosystems with the capacity to
 12 recover and adapt; and protect areas in ways that leave them unimpaired for
 13 present and future generations.

14 *EIS Response* – “Special efforts have been undertaken to avoid or minimize
 15 Project effects to habitat and ecosystem intactness and to replace the loss of
 16 important habitat types; for example, sensitive terrestrial habitat sites were
 17 avoided to the extent feasible when routing roads and locating borrow and
 18 excavated material placement areas. Overall, the likely Project related effects
 19 on ecosystem diversity are expected to be adverse but regionally acceptable
 20 because no stand level habitat types are lost, the distribution of area amongst
 21 the stand level habitat types is not expected to change substantially and the
 22 cumulative area losses for all of the priority habitat types remains below 10%
 23 (Keeyask HLP 2012, 9.5)”

24 Principle 1 of Manitoba Hydro’s Sustainable Development Principles – Stewardship of
 25 the Economy and the Environment

26 *Principle* – Recognize its responsibility as a caretaker of the economy and the
 27 environment for the benefit of present and future generations of Manitobans.
 28 Meet the electricity needs of present and future Manitobans in a manner that
 29 ensures the long-term integrity and productivity of our economy, our
 30 environment and our natural resources, and safeguards our human health.

31 *EIS Response* – Consistent with the KCNs’ commitment to caring for Askiy and
 32 Manitoba Hydro’s commitment to sustainable development, the Project has
 33 been designed to minimize adverse effects and maximize benefits to local and
 34 regional residents. Manitoba Hydro and the KCNs have planned the Project

35 together and completed more than a decade of both ATK and technical studies
 36 to predict and mitigate adverse effects and enhance Project benefits. (Keeyask
 37 HLP 2012, 9.11).

38 In general, there are few to no mentions of enhancing the natural environment and
 39 improving ecological resilience. Where there are attempts described as improvements
 40 (such as a habitat and fish-stocking program (Keeyask HLP 2012, 9.4) there are concerns
 41 regarding whether such actions will in fact lead to long-term improvement.

42 Given the historically negative impact of hydro development on the natural
 43 environment (as well as First Nations ways of living, etc.) it is imperative that future
 44 actions by Manitoba Hydro lead to improved environmental outcomes rather than
 45 simply avoiding adverse effects. Furthermore, given the proponents' claims to have met
 46 various sustainability goals, principles, policies and guidelines, many of which require
 47 environmental enhancement, it is necessary for the proponent to better describe and
 48 justify how its actions will lead to such enhancement.

49 Please describe how the proposed EIS will have positive impacts on the environment as
 50 opposed to minimizing adverse harm. Please provide attention to:

- 51 · climate change mitigation
- 52 · enhancement of long-term ecological resilience
- 53 · appropriate land-use planning
- 54 · the avoidance of adverse effects

55 **FOLLOW-UP QUESTION:**

56 In several instances the project proponent outlines principles, policies, guidelines and
 57 goals for sustainable development that require enhancement of the natural
 58 environment, for which the proposed project is claimed to meet. Two examples are:

59 Goal 6 of Federal Sustainable Development Goals - Ecosystem / Habitat
 60 Conservation and Protection with the EIS Response at Keeyask HLP 2012, 9.5

61

62 Principle 1 of Manitoba Hydro's Sustainable Development Principles –
 63 Stewardship of the Economy and the Environment with the EIS Response
 64 Keeyask HLP 2012, 9.11.

65 However, there are few to no mentions of enhancing the natural environment and
 66 improving ecological resilience. Where there are attempts described as improvements
 67 (such as a habitat and fish-stocking program (Keeyask HLP 2012, 9.4) there are concerns
 68 regarding whether such CAC-IR Round 2-35 July 31, 2013 CAC MB Sustainability CAC-IR-
 69 0066 actions will in fact lead to long-term improvement. It is imperative that future

70 actions by Manitoba Hydro lead to improved environmental outcomes rather than
71 simply avoiding adverse effects.

72 Given the historically negative impact of hydro development on the natural
73 environment (as well as First Nations ways of living, etc.) and the proponents claims to
74 meet various sustainability goals many of which require environmental enhancements,
75 it is important for the proponent to describe how its actions will lead to such
76 enhancements and provide justification in situations where enhancements will not be
77 delivered.

78 **Description of Response**

79 The response provided was directly related to the individual bulleted sections – i.e.
80 climate change mitigation, enhancement of long-term ecological resilience, appropriate
81 land-use planning, the avoidance of adverse effects – without addressing the general
82 intent of the question, which was to provide the proponent with an opportunity to
83 describe how the project as a whole will have a positive impact on the environment and
84 the resilience of nearby (local, regional, provincial) ecosystems. In this sense, the
85 Partnership has provided a piecemeal response that does not easily – if at all – allow an
86 informed opinion to be drawn. Moreover, there are some specific items of note that
87 require additional clarification.

88 **Question regarding Climate change mitigation**

89 The Partnership refers to the Life Cycle Assessment of the Pembina Institute and
90 discusses the potential displacement of CO₂ during the early years of operation,
91 however, it does not address the expected impacts of the dam on local ecological
92 resilience to climate change.

- 93 · Please discuss whether it is expected that Projects effects such as the flooding and
94 fragmentation of land, the increase in methyl-mercury concentration and other
95 adverse effects are expected to have impacts on the ability of local ecosystems and
96 individual species to adapt to climate change.
- 97 · Please describe how the proposed project will have positive impacts on the
98 environment, including the overall ability of local ecosystems to adapt to climate
99 change.

100 **Question regarding appropriate land-use planning**

101 With regards to appropriate land-use planning, the proponent simply mentions that the
102 project is located on Crown lands, and that project effects considered existing land-use
103 plans and processes during the assessment. This response provides no discussion of how
104 land-use planning will be used to improve environmental outcomes in the future.

- 105 · Please describe how the proposed project will have positive impacts on the
 106 environment, including how appropriate land-use planning measures will be
 107 undertaken to improve environmental outcomes from an appropriate baseline.

108 **Question regarding the advance of the adverse effects**

109 With regards to adverse effects, the Partnership responds by listing various mitigation
 110 measures and plans (e.g. the Waterways Management Program, the establishment of a
 111 Workers Interaction Committee). These plans and programs are all commendable, but
 112 once again they do not indicate any positive environmental outcomes, but rather
 113 attempts to lessen negative outcomes. Avoidance of adverse effects can only deliver
 114 positive effects if there are net benefits – if the avoidance allows gains that otherwise
 115 would not be possible, or if the avoidance is achieved in an undertaking that replaces
 116 some other activity that is or would be more damaging. Mere mitigation of adverse
 117 effects only makes a project less adverse.

- 118 · Please describe how the proposed project will have positive impacts on the
 119 environment, including how net environmental gains will be delivered.

120 **RESPONSE:**

121 The Response to EIS Guidelines responds to the requirements in the EIS Guidelines and
 122 the *Environment Act* (Manitoba):

- 123 · The EIS Guidelines require the Partnership to “describe how implementation of the
 124 Project components and activities have been planned in a careful and precautionary
 125 manner in order to ensure that significantly adverse or unwarranted environmental
 126 effects will not occur, especially with respect to environmental functions and
 127 integrity, considering system tolerance and resilience, and/or the human health of
 128 current or future generations”.
- 129 · The *Environment Act* (Manitoba) defines assessment as “an evaluation of a proposal
 130 to ensure that appropriate environmental management practices are incorporated
 131 into all components of the life cycle of a development”.

132 There is no requirement in this instance for the Response to EIS Guidelines to ensure
 133 that future actions lead to improved environmental outcomes, but as indicated in the
 134 previous response (CEC Rd 1 CAC-0066), opportunities to enhance the existing disturbed
 135 environment and improve ecological resilience are implemented where practicable in
 136 the Project.

137 As described in Chapter 8 of the Response to EIS Guidelines (Monitoring and Follow-up),
 138 the Partnership is committed to constructing and operating the Keeyask Generation
 139 Project (the Project) in a manner that facilitates the long-term integrity and productivity
 140 of the economy, environment, and natural resources, and that safeguards human

141 health. This is achieved through monitoring, reporting, and regulatory oversight. As
142 indicated, the primary goal is to sustain the existing environment and enhance wherever
143 possible. Substantial reductions in greenhouse gases (GHG) by displacing fossil fuel
144 electricity generation and measures pertaining to Lake Sturgeon were provided as
145 examples of enhancement and improving resilience over existing conditions in the
146 previous response.

147 The reviewer points out that there has been no explicit description provided in the
148 Response to EIS Guidelines on how adverse effects such as the flooding and
149 fragmentation of land and increases in methyl mercury will impact the ability of local
150 ecosystems and individual species to climate change. In Section 6 of the Response to EIS
151 Guidelines, the conclusions of the residual effects of the Project are reviewed with
152 respect to the sensitivity of these conclusions to climate change. This was done for the
153 physical, aquatic, terrestrial, socio-economic, resource use, and heritage environmental
154 components.

155 The Information Request states that many of the sustainability goals that the
156 Partnership claims to meet require environmental enhancements. Of the eight Federal
157 Sustainability goals listed and 13 provincial sustainable development
158 principles/guidelines listed in Chapter 9 of the Response to EIS Guidelines, only two of
159 the federal goals reference enhancing the environment – Goal 3 ;water quality and Goal
160 4 water availability (Page 9-4 of the Response to EIS Guidelines). Goal 3 concerns
161 protection and enhancement of water quality. While the Project will not enhance water
162 quality, the Partnership has taken steps to protect water quality such that it will support
163 healthy ecosystems.

164 Goal 4 relates to enhancing information on water availability to assist in management of
165 water resources. The Partnership has conducted numerous studies on water resources
166 leading to the development of this Project and much monitoring on this topic will
167 continue thus contributing to understanding of water resources in the region.

168 The Partnership's environmental assessment took account of land-use planning that
169 has been completed or is underway with respect to areas affected by the Project.
170 Where relevant, the Partners are participating in established land-use planning
171 processes i.e., in the case of the Town of Gillam, Manitoba Hydro and FLCN are
172 participating, along with the Town of Gillam, in this planning process that pertains to the
173 future of the Town. In addition, Manitoba Hydro, TCN and FLCN (along with the Province
174 of Manitoba) participate in established resource management boards for the Split Lake
175 Resource Management Area (TCN) and the Fox Lake Resource Management Area
176 (FLCN), which provide advice to the Province on resource management matters.

177 Please also see the response to CEC Rd 2 CAC-0149.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: C.9-6**
 2 **and 12; Page No.: N/A**

3 **CEC Rd 2 CAC-0146**

4 **ORIGINAL PREAMBLE AND QUESTION (CAC-0067):**

5 Rationale In several instances the project proponent outlines principles, policies,
 6 guidelines and goals for sustainable development that require integrated decision-
 7 making, for which the proposed project is claimed to meet. Two examples are

8 Government of Manitoba Sustainable Development Principle – Integration of
 9 Environmental and Economic Decisions

10 *Principle* – Economic decisions should adequately reflect environmental, human
 11 health and social effects. Environmental and health initiatives should
 12 adequately take into account economic, human health and social consequences.

13 *EIS Response* – The proponent argues the project will provide clean affordable
 14 energy in comparison to coal and gas (Keeyask HLP 2012, 9.6).

15 Manitoba Hydro Policy/Principle 3 – Integration of Environmental and Economic
 16 Decisions:

17 *Policy/Principle* – Treat technical, economic and environmental factors on the
 18 same basis in all corporate decisions, from initial planning to construction to
 19 operations to decommissioning and disposal. To the extent practical, include
 20 environmental costs in economic and financial analysis.

21 *EIS Response* – A major example of this integration is the Project design. The
 22 Project incorporates mitigation, compensation and enhancement measures to
 23 reduce adverse environmental and social impacts and maximize benefits. By
 24 incorporating these measures into the Project’s capital and operating budgets,
 25 the Project costs closely reflect the full societal cost of the Project (Keeyask HLP
 26 2012, 9.12).

27 Both responses by the proponent are noteworthy insofar as they illustrate attempts to
 28 increase positive outcomes from the project. However, it is unclear to what extent the
 29 EIS represents a serious attempt at integration.

30 The intent of integration is not simply to look at mitigation or enhancement of effects in
 31 economic, social and biophysical areas, but rather to consider the entire full suite of
 32 requirements for progress towards sustainability, including their interrelations, covering

33 interactive effects as well as effects in particular areas. Likewise, the impacts of the
 34 project - both good and bad, on the natural environment, First Nation communities, the
 35 people of Manitoba, etc. both now and in the future – cannot be separated into social,
 36 ecological, and economic components without losing much, if not all, that many
 37 consider valuable in this world. Given the scale of this proposed project, and the
 38 possibility of the project providing long-term lasting benefits, if properly undertaken, it
 39 is important to ensure that the decision-making framework is appropriated integrated.

40 Please describe how the proposed EIS represents an integrated approach to decision-
 41 making and planning, particularly with regards to sustainable development. Please
 42 provide attention to:

- 43 · applying integrated assessment to seek the best alternative
- 44 · the achievement of mutually reinforcing positive gains through all of Manitoba
 45 Hydro's activities
- 46 · the avoidance of tradeoffs

47 **FOLLOW-UP QUESTION:**

48 In several instances the project proponent outlines principles, policies, guidelines and
 49 goals for sustainable development that require integrated decision-making, which the
 50 Partnership claims the proposed project reflects. Two examples are

51 Government of Manitoba Sustainable Development Principle – Integration of
 52 Environmental and Economic Decisions with the EIS Response at Keeyask HLP
 53 2012, 9.6.

54 Manitoba Hydro Policy/Principle 3 – Integration of Environmental and Economic
 55 Decisions: with the EIS Response at Keeyask HLP 2012, 9.12.

56 Both responses by the proponent are noteworthy insofar as they illustrate attempts to
 57 increase positive outcomes from the project. However, it is unclear to what extent the
 58 EIS represents a serious attempt at integration. The intent of integration is not simply to
 59 look at the cost of mitigating an adverse effect, but rather to consider positive and
 60 adverse effects in light of the entire full suite of requirements for progress towards
 61 sustainability, including their interactions. Likewise, the impacts of the project – both
 62 good and bad, on the natural environment, First Nation communities, the people of
 63 Manitoba, etc., both now and in the future – cannot be separated into social,
 64 ecological, and economic components without neglecting key practical realities and
 65 losing much that is valuable in this world. Given the scale of this proposed project, and
 66 the potential it shows to provide long-term lasting benefits, if properly undertaken, it is
 67 important to ensure that the decision making framework is appropriated integrated.

68 **Description of response**

69 The Partnership's response is to note, "The Partnership considers this Information
70 Request to be out of scope of the Clean Environment Commission review of the Keeyask
71 Generation Project. The details being requested will be reviewed and discussed as part
72 of the Needs For and Alternatives To (NFAT) review of Manitoba Hydro's preferred
73 development plan currently being undertaken by the Public Utilities Board (PUB) at the
74 request of the Manitoba government." The proponent then proceeds to describe the
75 terms of reference of the NFAT review.

76 Leaving aside for a later date, the discussion of whether it is open to the CEC to consider
77 alternatives, the response of the Partnership is not adequate. Regardless of whether the
78 Partnership wishes to discuss 'alternatives to' in the EIS, it is still required to integrate
79 economic and environmental decisions. Based on Manitoba Hydro's own sustainability
80 policy/principle, it must "[t]reat technical, economic and environmental factors on the
81 same basis in all corporate decisions, from initial planning to construction to operations
82 to decommissioning and disposal."

83 If all corporate decisions, from initial planning to construction to operation, to
84 decommissioning must integrate economic and environmental factors, then clearly the
85 EIS must reflect this integration. It is contingent upon Manitoba Hydro to show how it
86 meets its own stated requirements.

87 The Manitoba Government and Manitoba Hydro guidelines, policies and principles of
88 sustainable development, clearly require integrated decision-making. In Chapter 9 of the
89 EIS, The Partnership extolls the virtues of the proposed dam in light of these sustainable
90 development criteria. Such claims must be supported by explicit presentation of
91 integrated and comparative assessment that confirms the superiority of the asserted
92 virtues.

93 Please describe how the proposed EIS represents an integrated approach to decision-
94 making and planning, particularly with regards to sustainable development. Please
95 provide attention to:

- 96 a. applying integrated assessment through all of the Partnership's decision and
97 planning process
- 98 b. applying integrated assessment through all stages of the proposed dam
- 99 c. the achievement of mutually reinforcing positive gains through all of the
100 Partnership's activities
- 101 d. the avoidance of tradeoffs.

102 **RESPONSE:**

103 The wording of the follow-up question above is different than the original question in
 104 CEC Rd 1 CAC-0067, which the Partnership deemed to be out of scope of the CEC
 105 process. In its original question, CAC asked:

106 *Please describe how the proposed EIS represents an integrated approach to decision*
 107 *making and planning, particularly with regards to sustainable development. Please*
 108 *provide attention to:*

- 109 . *applying integrated assessment to seek the best alternative*
- 110 . *the achievement of mutually reinforcing positive gains through all of Manitoba*
 111 *Hydro's activities*
- 112 . *the avoidance of tradeoffs*

113 The Follow-up Question above focuses in part on the Partnership's decision making
 114 process with respect to Keeyask. The Partnership addresses below the elements that
 115 relate to the Partnership and the EIS, and agrees that this question is in scope.

116 Chapter 6 of the Project Description Supporting Volume (PD SV), Alternative Means,
 117 Design Enhancements and Mitigation Alternatives, documents the project planning
 118 process used by the Partnership to plan the Project, including the evaluation of a variety
 119 of different alternatives for designing the Project, and for developing and selecting
 120 appropriate mitigation options. This Chapter walks through the evaluation processes
 121 for:

- 122 . Selecting the generating station site and reservoir level;
- 123 . Determining the general arrangement of primary structures;
- 124 . Determining operating range, mode of operation;
- 125 . Design of the powerhouse, spillway and dykes;
- 126 . Determining site access, camp locations and construction material sources; and
- 127 . Assessing and selecting alternative mitigation measures.

128 In virtually all cases, an iterative process was undertaken to evaluate potential
 129 alternatives based on technical feasibility and engineering design, environmental and
 130 socio-economic considerations and cost.

131 Studies prior to the 1980s going back to the 1960s focused on identifying potential sites
 132 for developing hydroelectric generating stations on the Nelson River. Iterative and
 133 integrated evaluation processes have been underway since the 1980s, when initial
 134 studies were undertaken to develop concepts for sites at Birthday Rapids and Gull
 135 Rapids. Over time, as the intensity of work to design and plan Keeyask has increased and
 136 the Partnership structure was established, these processes became far more robust,

137 including a much greater range of considerations and involving analysis and review by a
138 larger number of technical specialists and potentially affected stakeholders. Throughout
139 the design and assessment process, the first priority of the Partnership has consistently
140 been to avoid adverse effects, whenever possible.

141 Opportunities to seek mutually reinforcing positive gains have been sought by the
142 Partnership. However, it has not always been possible to avoid tradeoffs. In most cases,
143 attempts have been made to minimize the amount of tradeoff by reviewing and
144 evaluating a variety of possible alternatives. Tables 6-2 through 6-5 of the PD SV provide
145 a number of good example of how the Partnership sought to evaluate and select
146 mitigation measures for the aquatic, terrestrial, and socio-economic, resource use and
147 heritage resources environments through an integrated assessment of possible options
148 that seek to minimize trade-offs and to enhance possible gains.

149 Each of the Keeyask Cree Nations has also undertaken its own internal assessment
150 process to determine whether and how it will participate in the Keeyask Generation
151 Project. These assessments have been undertaken using a holistic and integrated
152 approach based on the Cree worldview that focuses heavily on future generations.

153 Representatives of the Partnership have worked together on designing and developing
154 the Project since the late 1990s. Decisions about Project design and the assessment
155 have consistently been made through an open and collaborative multi-stakeholder
156 process since that time. The processes and linkages between the Cree and regulatory
157 evaluations are described more fully in the response to CEC Rd 1 CAC-0101.

158 It is anticipated that these types of processes will continue as the project is constructed
159 and operated through analysis and discussion that takes place among the Partnership
160 Board and its committees. For example, the response to CEC Rd 1 CAC-0061b outlines
161 how the Partners will work together to monitor and implement adaptive management
162 measures throughout the course of project implementation.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 9-10**
 2 **and 13; Page No.: N/A**

3 **CEC Rd 2 CAC-0147**

4 **ORIGINAL PREAMBLE AND QUESTION (CAC-0068):**

5 Rationale In several instances the project proponent outlines principles, policies,
 6 guidelines and goals for sustainable development that relate to the development of a
 7 sustainable society. Two examples are

8 Manitoba Guidelines for Sustainable Development – Waste Minimization and
 9 Substitution:

10 *Guideline* - (a) Encouraging and promoting the development and use of
 11 substitutes for scarce resources where such substitutes are both
 12 environmentally sound and economically viable; and (b) Reducing, reusing,
 13 recycling and recovering the products of society.

14 *EIS Response* – While opportunities to recycle wastes in remoter northern areas
 15 are limited, waste generated by the Project will be minimized and waste
 16 materials will be recycled to the extent practical, and the remaining waste will
 17 be disposed of in accordance with license and regulatory requirements (Keeyask
 18 HLP 2012, 9.10).

19 Manitoba Hydro Sustainable Development Policy/Principles – Conservation

20 *Policy/Principle* – To the extent practical, plan, design, build, operate, maintain
 21 and decommission Corporate facilities in a manner that protects essential
 22 ecological processes and biological diversity. Give preference, where practical,
 23 to projects and operating decisions that use renewable resources or that extend
 24 the life of supplies of non-renewable resources.

25 *Response* – Hydropower utilizes a renewable resource, thus assisting in the
 26 conservation of non-renewable resources such as gas or coal that otherwise
 27 would be used to generate the electricity being produced at the Project
 28 (Keeyask HLP 2012, 9.13).

29 The responses by the proponent indicate positive steps, but much more is evidently
 30 needed. Both the guideline and the policy/principle provided above need to be
 31 understood more broadly in society. Neither of them relates solely, nor even primarily,
 32 to the environmental impacts of supplying electricity, but rather to the broader
 33 consumption of resources and production of wastes in society. Furthermore, this

34 broader understanding of sustainability is illustrated in Manitoba Hydro's full set of
35 sustainable development policy/principles (Manitoba Hydro n.d.).

36 The proposed project represents an important opportunity for Manitoba to take steps in
37 a transition towards a more sustainable society. For such a transition to take place,
38 however, planning for future energy undertakings must take proactive measures to
39 address both the supply of electricity as well as the end-uses of the electricity. At this
40 point, however, it is unclear how the proposed project plays a role in the transition to a
41 sustainable society beyond reducing GHG emissions.

42 Please provide as background an explanation of how the comparative assessment of
43 alternatives leading to the project proposal included attention to sustainability
44 principles including the one noted above in determining that the proposed project
45 would be preferable to demand management alternatives.

46 Please also describe how the proposed project will help Manitoba transition to a
47 sustainable society that uses energy and resources in an efficient, benign and renewable
48 manner. Please provide attention to:

- 49 · the reduction of overall energy and resource consumption
- 50 · the promotion of appropriate uses of energy and matching of energy supply quality
51 to final needs
- 52 · the development of a resilient energy system in Manitoba
- 53 · the avoidance of resource conflicts

54 **FOLLOW-UP QUESTION:**

55 In several instances the project proponent outlines principles, policies, guidelines and
56 goals for sustainable development that relate to the development of a sustainable
57 society. Two examples are:

58 Manitoba Guidelines for Sustainable Development – Waste Minimization and
59 Substitutionable; and (b) Reducing, reusing, recycling and recovering the
60 products of society with the EIS Response at Keeyask HLP 2012, 9.10.

61 Manitoba Hydro Sustainable Development Policy/Principles – Conservation with
62 the EIS Response at Keeyask HLP 2012, 9.13.

63 The responses by the proponent indicate positive steps but much more is needed. Both
64 the guideline and the policy/principle provided above need to be understood more
65 broadly in society. Neither of them relates solely, nor even primarily, to the
66 environmental impacts of supplying electricity, but rather to the broader consumption
67 of resources and production of wastes in society. Furthermore, this broader

68 understanding of sustainability is illustrated in Manitoba Hydro's full set of sustainable
69 development policy/principles (Manitoba Hydro n.d.).

70 The proposed project represents an important opportunity for Manitoba to transition
71 towards a more sustainable society. For such a transition to take place, however, large-
72 scale projects, such as the Keeyask project, must be designed and implemented as
73 proactive measures to address both the supply of electricity and the end-uses of the
74 electricity. At this point, however, it is unclear how the proposed project plays a role in
75 the transition to a sustainable society beyond reducing GHG emissions.

76 Description of response

77 The Partnership's response to the IR is to argue that the IR extends to matters beyond
78 the scope of the CEC review which will be discussed at the NFAT review. This response is
79 unacceptable.

80 First, the terms of reference for the EIS clearly require a discussion of the impacts of the
81 dam on the capacity of renewable resources:

82 The EIS must describe the effects of the Project on the capacity of renewable
83 resources to meet the needs of the present and those of the future. The EIS
84 must identify those resources likely to be significantly affected by the Project,
85 and describe how the Project could affect their sustainable use. The EIS must
86 also identify and describe any criteria used in considering sustainable use.
87 Sustainable use may be based on ecological considerations such as integrity,
88 productivity, and carrying capacity {CEAA, 2012 #2582, p. 25}

89 This requirement contradicts the Partnership's claim that the question is beyond the
90 scope of the EIS.

91 Second, Manitoba Hydro's own sustainable development policy/guidelines requires
92 attention to renewable resources, non-renewable resources, and conservation. As
93 noted in the original IR:

94 Policy/Principle – To the extent practical, plan, design, build, operate, maintain
95 and decommission Corporate facilities in a manner that protects essential
96 ecological processes and biological diversity. Give preference, where practical,
97 to projects and operating decisions that use renewable resources or that extend
98 the life of supplies of non-renewable resources {Manitoba Hydro, n.d. #2584}

99 Application of this policy/principle would entail work that is central to the information
100 request and should be available for the CEC review. As noted above, the Partnership, in
101 Chapter 9 of the EIS, extolls the virtues of the proposed dam in light of these sustainable

102 development criteria and ought to show how its assessment, including attention to the
103 items in this proposed IR, applied these principles.

104 **Question**

105 Please describe how the proposed project will help Manitoba transition to a sustainable
106 society that uses energy and resources in a renewable manner. Please provide attention
107 to

- 108 a. the reduction of overall energy and resource consumption
- 109 b. the promotion of appropriate uses of energy and matching of energy supply quality
110 to final needs
- 111 c. the development of a resilient energy system in Manitoba
- 112 d. the avoidance of resource conflicts.

113 **RESPONSE:**

114 A review of Manitoba Hydro's development plan and choices with respect to use of
115 provincial energy resources within the context of the Manitoba *Sustainable*
116 *Development Act* will be discussed as part of the Needs For and Alternatives To (NFAT)
117 review currently being undertaken by the Public Utilities Board (PUB).

118 At the highest level, and as already noted in the EIS, the Keeyask Generation Project is
119 expected to offset the use of energy generated through the burning of fossil fuels. The
120 Project also has lower emissions than the other potential alternatives that are available
121 within Manitoba, as is demonstrated in Figure 2.4-2 of the PE SV (see also response to
122 CEC Rd 1 CAC-0073). Water, unlike fossil fuels, is also a renewable resource and the
123 development of Keeyask will provide a long-term, reliable source of energy for future
124 generations of Manitobans.

125 Keeyask is being developed in a responsible way and in a manner that avoids or
126 minimizes adverse effects and that enhances positive benefits to the extent possible.
127 There are several examples of this provided throughout the Partnership's EIS filing. It
128 has also been designed in Partnership with those that have the potential to be most
129 affected by its development. Efforts have been made to find mitigation measures to
130 avoid, minimize and offset potential adverse effects through collaborative, multi-lateral
131 processes and based on a consideration of a range of alternatives and differing
132 perspectives (see Chapter 6 of the PD SV and the response to CEC Rd 2 CAC-0146).

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: C.9 – 6**
 2 **and 14; Page No.: N/A**

3 **CEC Rd 2 CAC-0148**

4 **ORIGINAL PREAMBLE AND QUESTION (CAC-0069):**

5 **Rationale**

6 In several instances the project proponent outlines principles, policies, guidelines and
 7 goals for sustainable development that relate to the need for fostering and maintaining
 8 livelihood opportunities. Two examples are:

9 Government of Manitoba Principles of Sustainable Development – Shared Responsibility
 10 and Understanding

11 *Principle* – Manitobans should acknowledge responsibility for sustaining the
 12 economy, the environment, human health and social well-being, with each
 13 being accountable for decisions and actions in a spirit of partnership and open
 14 cooperation. Manitobans share a common economic, physical and social
 15 environment. Manitobans should understand and respect differing economic
 16 and social views, values, traditions and aspirations. Manitobans should consider
 17 the aspirations, needs and views of the people of the various geographical
 18 regions and ethnic groups in Manitoba, including Aboriginal peoples, to
 19 facilitate equitable management of Manitoba's common resources (Manitoba
 20 1998).

21 *EIS Response* – The processes for developing the Project have included the
 22 development of a partnership that is intended, in part, to meet the societal,
 23 cultural, economic and employment aspirations of the local KCNs communities,
 24 which include the continuation of traditional and cultural practices, as well as a
 25 deeper integration into the regional and provincial economy. Discussions
 26 leading to the formation of the Partnership and the planning and environmental
 27 assessment activities have led to a growing understanding and respect for the
 28 different values, and worldviews of Manitoba Hydro and the KCNs. (Keeyask HLP
 29 2012, 9.6).

30 Manitoba Hydro Sustainable Development Policy/Principles – Understanding and
 31 Respect

32 *Policy/Principle* – Strive to understand and respect differing social and economic
 33 views, values, traditions and aspirations when deciding upon or taking action.
 34 Give preference to those alternatives that best fulfil Corporate objectives while

35 minimizing infringement on the ability, rights, and interests of others to pursue
36 their aspirations.

37 *EIS Response* – The Project proponent is a partnership comprising Manitoba
38 Hydro and the KCNs. Considerable effort has been made in forging constructive
39 relationships between Manitoba Hydro and the KCNs, including facilitating
40 community studies aimed at understanding history, community history, and
41 more importantly the Cree worldview and ATK. This growing understanding has
42 had a major impact on Project design, construction and operation. It has also led
43 to specific arrangements through community-specific [adverse effects
44 agreements]” (Keeyask HLP 2012, 9.14).

45 Both responses are notable insofar as they recognize the shared responsibility of the
46 project proponents to ensure lasting and desirable livelihood opportunities and
47 foundations, particularly among the First Nation communities. While the EIS contains
48 significant discussion relating to livelihood opportunities, no overall picture emerges
49 from the discussions with regards to the overall and integrated effects on livelihood
50 opportunities, especially lasting ones. A project of this scope may provide Manitoba
51 Hydro an important opportunity to meet the goals of sustainable livelihood foundations
52 over the entire lifecycle of the project (e.g. construction, operation, end-use of the
53 electricity). To obtain these benefits requires a proactive and integrated approach to
54 decision making.

55 Please describe how the proposed project will ensure sufficient and desirable livelihood
56 opportunities both now and in the future. Please provide attention to:

- 57 · basic livelihood foundations (e.g. skills and education, social capital)
- 58 · protection of the most vulnerable
- 59 · lasting local economic development
- 60 · maintenance of First Nations ways of living; and
- 61 · prevention of boom and bust cycles Please describe how the proposed project
62 compares with alternatives to and alternative means of the project with regards to
63 fostering livelihood opportunities.

64 **FOLLOW-UP QUESTION:**

65 Preamble

66 In several instances the project proponent outlines principles, policies, guidelines and
67 goals for sustainable development that relate to the need for fostering and maintaining
68 livelihood opportunities. Two examples are

69 Government of Manitoba Principles of Sustainable Development – Shared
 70 Responsibility and Understanding with the EIS Response at Keeyask HLP 2012,
 71 9.6.

72 Manitoba Hydro Sustainable Development Policy/Principles – Understanding
 73 and Respect at Keeyask HLP 2012, 9.14.

74 Both responses are notable insofar as they recognize the shared responsibility of the
 75 project proponents to ensure lasting and desirable livelihood opportunities and
 76 foundations, particularly among the First Nation communities.

77 While the EIS contains significant discussion relating to livelihood opportunities, no
 78 overall picture emerges from the discussions with regards to the overall and integrated
 79 effects on livelihood opportunities. A project of this scope provides the Partnership with
 80 an important opportunity to meet the goals of sustainable livelihood foundations over
 81 the entire lifecycle of the project (e.g. construction, operation, end-use of the
 82 electricity). To obtain these benefits requires a proactive and integrated approach to
 83 decision-making.

84 **Description of response**

85 The Partnership provides a fairly lengthy response that is commendable insofar as it
 86 addresses various facets of the original question.

87 Unlike the EIS, which generally argues there will be no boom and bust dynamics, the
 88 response to the IR offers a more nuanced discussion:

89 There is no doubt that a project of this nature has the potential to create a
 90 boom-bust cycle within the KCNs and in other local communities. The extent to
 91 which this boombust is experienced will, in part, depend on the level of
 92 participation in the Project by individual KCNs members, the timing of other
 93 future developments in the region (e.g., development of the proposed
 94 Conawapa Generation Project) and measures implemented by leadership at the
 95 community level. Counseling services, including financial counseling, are
 96 provided for site employees and may help to assist individual employees and
 97 their families with this transition at the end of the Project construction period.

98 While this elaboration of potential boom and bust dynamics, and anticipated responses
 99 to negative effects, is useful, the response does not address how boom and bust may be
 100 avoided. A careful analysis of means of avoiding and softening adverse boom and bust
 101 dynamics, including project scheduling, is crucial and to the best of our knowledge has
 102 not been provided.

103 **Question**

104 Please provide further information on boom and bust dynamics in the Keeyask project,
105 including, but certainly not limited to:

- 106 a. The factors that may lead to boom and bust (due to Keeyask and other reasonably
107 anticipated projects (e.g. Conawapa)
- 108 b. What steps the Partnership will take to prevent adverse boom and bust from
109 occurring
- 110 c. What steps the Partnership will take to manage, mitigate, make reparations for, any
111 boom and bust that does occur

112 **RESPONSE:**

113 The original response provides examples of factors that may lead to boom and bust, and
114 notes that the extent to which this boom-bust is experienced will, in part, depend on
115 the level of participation in the Project by individual KCNs members, the timing of other
116 future developments in the region (e.g., development of the proposed Conawapa
117 Generation Project) and measures implemented by leadership at the community level.

118 The original response also provides several examples of the mechanisms involving either
119 the Partnership or its Members that will “soften” the boom-boost cycle, including:

- 120 · The capacity built through Project training, employment and business opportunities,
121 which can be used to access future available opportunities within the region and
122 elsewhere.
- 123 · Revenue stemming from a community’s investment equity in the Project, which can
124 be used to bolster community-based development activity.
- 125 · Efforts to provide KCNs Members with long-term employment opportunities at
126 Manitoba Hydro through operational jobs commitment in the JKDA, which may
127 provide ongoing employment for some KCNs members.
- 128 · Counseling services at site and programs through the Adverse Effects Agreements,
129 which may be accessed by KCNs members to manage the transition from peak
130 project activity.

131 The EIS also notes that increased business activity in Gillam during the operation phase
132 of the Project will help to ease the boom-bust effects (see Section 6.6.3.2.3 of the
133 Response to EIS Guidelines). Reasons for the boom-bust cycle are discussed in Section
134 6.6.3.1.1 of the Response to EIS Guidelines and in Sections 3.4.1.2.2, 3.4.2.2.2, and
135 5.4.1.4.1 of the Socio-economic, Resource Use and Heritage Resources Supporting
136 Volume.

137 It is beyond the ability of the Partnership to fully prevent or eliminate a boom-bust
138 associated with the development of the Keeyask Generation Project – this is the reality
139 of a short-term construction project.

140 It would be advantageous if the construction of the potential Conawapa Generation
141 Project was timed to provide an on-going source of employment in the region. (Just as
142 some members of the Wuskwatim workforce have transitioned to work on the Keeyask
143 Infrastructure Project.) Based on current schedules, it is possible this may occur.
144 However, this type of transition is exceptionally difficult to strategically manage and
145 achieve given the uncertainties associated with planning and licensing processes, and
146 the evolving nature of the workforce at the construction site. For example, some skills
147 may only be required in the early years of Keeyask construction and there may be a lag
148 between the end of these opportunities on Keeyask and the start of these opportunities
149 on Conawapa.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: C.9-8**
2 **and 15; Page No.: N/A**

3 **CEC Rd 2 CAC-0149**

4 **ORIGINAL PREAMBLE AND QUESTION (CAC-0070):**

5 **Rationale**

6 In several instances the project proponent outlines principles, policies, guidelines and
7 goals for sustainable development that relate to the need to leave a positive legacy for
8 future generations. Two examples are

9 Government of Manitoba Principles of Sustainable Development – Stewardship

10 *Principle* – The economy, the environment, human health and social well-being
11 should be managed for the equal benefit of present and future generations.
12 Manitobans are caretakers of the economy, the environment, human health
13 and social well-being for the benefit of present and future generations. Today's
14 decisions are to be balanced with tomorrow's effects.

15 *EIS Response* – Partnership income will be beneficial to generations of KCNs
16 community Members, and will provide sustained revenues to the broader
17 Manitoba economy. (Keeyask HLP 2012, 9.6).

18 Government of Manitoba Guidelines for Sustainable Development –Integrated Decision
19 Making and Planning

20 *Guideline* – Encouraging and facilitating decision making and planning processes
21 that are efficient, timely, accountable and cross-sectoral and which incorporate
22 an inter- generational perspective of future needs and consequences.

23 *EIS Response* – “The Partnership has established a governance structure that
24 includes KCNs representation. As part of this structure, the communities have
25 had direct involvement in the environmental assessment and will continue to
26 have a strong role with their Aboriginal traditional knowledge (ATK) in the
27 monitoring and follow-up programs. Each partner concerns itself with the short
28 and long-term benefits and costs of the Project. Multi-generational benefits are
29 key to the commitment of the KCNs’ participation in the Project (Keeyask HLP
30 2012, 9.9).

31 The responses by the proponent are commendable insofar as they outline various
32 attempts to ensure a positive legacy, particularly with regards to First Nations

33 communities. However, there is a need to broaden the scope of analysis when
34 considering what a positive legacy entails.

35 With reference to the guideline and principle provided above, as a crown corporation
36 Manitoba Hydro has a duty to ensure a positive legacy more broadly in society. Some
37 relevant – although non-exhaustive – issues include the extent to which future concerns
38 will be met by present savings (e.g. setting aside money and resources for successful
39 adaptive environmental management), as well as ensuring that future generations have
40 sufficient resources and capital (social, financial, natural, etc.) to meet their needs. A
41 project of this scope provides Manitoba Hydro an important opportunity to ensure that
42 future generations are left with such a positive legacy, and this is something the EIS
43 should explicitly and fully address.

44 Please describe how the proposed project will leave a positive legacy for future
45 generations. Please provide attention to:

- 46 · the long-term availability of energy and other resources
- 47 · the potential for future generations to live sustainability (including maintenance of
48 First Nations ways of living)
- 49 · how future needs will be met by present savings

50 **FOLLOW-UP QUESTION:**

51 **Preamble**

52 In several instances the project proponent outlines principles, policies, guidelines and
53 goals for sustainable development that relate to the need to leave a positive legacy for
54 future generations. Two examples are

55 Government of Manitoba Principles of Sustainable Development – Stewardship
56 with the EIS Response at Keeyask HLP 2012, 9.6.

57 Government of Manitoba Guidelines for Sustainable Development –Integrated
58 Decision Making and Planning with the EIS Response at Keeyask HLP 2012, 9.9.

59 The responses by the proponent are commendable insofar as they outline various
60 attempts to ensure a positive legacy, particularly with regards to First Nations
61 communities. However, there is a need to broaden the scope of analysis when
62 considering what a positive legacy entails.

63 **Description of response**

64 The Partnership provides a lengthy response that addresses some of the questions
65 noted in the IR. However, there are still some concerns of note.

66 First, the response ignores broader legacy questions. As a crown corporation Manitoba
 67 Hydro has a duty to ensure a positive legacy more broadly in society. Some relevant –
 68 although nonexhaustive – issues include the extent to which future concerns will be met
 69 by present savings (e.g. setting aside money and resources for successful adaptive
 70 environmental management), as well as ensuring that future generations have sufficient
 71 resources and capital (social, financial, natural, etc.) to meet their needs. A project of
 72 this scope provides the Partnership with an important opportunity to ensure that future
 73 generations are left with such a positive legacy, and this is something the EIS should
 74 explicitly and fully address.

75 Second, in general the response provided by the Partnership does little to describe
 76 leaving a positive legacy. While the dam will likely provide renewable energy in the form
 77 of electricity for many decades, many of the other long-term impacts (and hence legacy
 78 impacts) are negative and require mitigation (e.g. through the Adverse Effects
 79 Agreements). While the Partnership's response includes a reference to the common
 80 short version of the Brundtland definition of sustainable development, the EIS and the
 81 description in the response are largely concerned with trying to make things less bad. It
 82 is contingent on the Partnership to provide a fuller description of how the proposed
 83 dam will make the future better.

84 Third, the Partnership's response regarding the long term revenue for KCN communities
 85 needs further elaboration. It is unclear what steps will be taken to ensure that
 86 community revenues are used in a constructive manner. Just as one example, the EIS
 87 itself notes that historically extra income has led to increased alcohol, gambling and
 88 drug use in many communities affected by resource development projects, it is important
 89 to ensure that this will not be the case in the proposed project. Otherwise, the revenue
 90 flow could have negative overall effects on the KCN communities.

91 Fourth, the Partnership's response provides little indication of how present resources
 92 will be set aside for future generations.

93 **Question**

94 In elaborating on your response to how the proposed project will leave a positive legacy
 95 please provide attention to:

- 96 a. A full description of how the project effects will lead to a better world for future
 97 generations, over and above the oft-cited low greenhouse gas emissions of
 98 hydroelectricity
- 99 b. How the project effects will provide for future generations greater resources and
 100 opportunities to live sustainability (including First Nations' ways of living)
- 101 c. How future needs will be met by present savings

102 **RESPONSE:**

103 The Partnership is of the view that the Keeyask Generation Project will leave a positive
 104 legacy for future generations and this is the primary reason why the Keeyask Cree
 105 Nations have decided to support the Project.

106 As noted in the original response to CEC Rd 1 CAC-0070:

107 The development of the Keeyask Generation Project will provide current and
 108 future generations with a long-term (at least 100 year) supply of renewable
 109 energy that emits extremely low levels of greenhouse gas emissions when
 110 compared to other forms of generation like gas or coal. This sustainable energy
 111 source will be developed in such a way that significant adverse effects to the
 112 capacity of renewable resources are avoided, and in some cases are enhanced
 113 (e.g., lake sturgeon) when compared to current conditions (see response to
 114 TAC/Public Rd 2 – CEAA-0015).

115 The examples provided go well beyond providing for lower greenhouse gas emissions –
 116 they speak to development of a *renewable* and *reliable* energy resource that is
 117 developed in a manner that *avoids and minimizes adverse effects* and, in some cases,
 118 *enhances current conditions*. These attributes are of value to both current and future
 119 generations and represent a responsible way to provide for the anticipated energy
 120 needs of Manitobans.

121 As noted in the original response, the Partnership has committed to substantial long-
 122 term mitigation and monitoring activities. The costs of these measures have been
 123 integrated into the development and operational costs of the station and have been
 124 considered when determining whether Keeyask should be pursued as part of Manitoba
 125 Hydro's overall development plan. The Project has also been designed in a manner that
 126 avoids or minimizes adverse effects and enhances benefits.

127 The efforts and resources used to plan and design Keeyask through an integrated
 128 assessment approach (as described in Chapter 6 of the PD SV) and in Partnership with
 129 the Keeyask Cree Nations have been done to minimize the potential for long-term
 130 legacy issues associated with the Project. The costs to compensate later for adverse
 131 effects are much greater than those saved by investing now in designing and
 132 implementing the Project in a responsible manner and with the full involvement and
 133 support of those most affected by its development.

134 It is completely unwarranted to suggest that the Partnership is only focused on making
 135 things "less bad". The Partnership has undertaken extensive efforts to put forward a
 136 Project plan that first and foremost seeks to avoid the potential for adverse effects in

137 the first place. Extensive efforts have also been made to enhance the long-term positive
138 benefits of the Project, including among other things:

- 139 · Negotiating a Partnership with local communities to build and operate Keyask that
140 provides these communities (those most affected by its development) with the
141 potential to benefit from long-term equity revenue stemming from their investment
142 in the Project – resources that will clearly be available to future generations to meet
143 their needs. The response to CEC Rd 1 CAC-0087 indicates how the revenues
144 distributed to the KCNs may be used, based on the Joint Keyask Development
145 Agreement.
- 146 · The development of innovative offsetting programs through the Adverse Effects
147 Agreements. These programs were designed by the communities based on their
148 identified issues and concerns. In each of the communities, there are programs
149 designed to enhance the ability of KCNs members to undertake cultural activities
150 and traditional pursuits, including increased consumption of healthy country foods.
151 These activities are at the core of Cree culture and create a sense of enhanced
152 community and self identity – key components of personal well-being. In the case of
153 the Fox Lake AEA, provision is also provided for establishment of a Crisis Centre and
154 Wellness Counseling, and for the implementation of an Alternative Justice Model in
155 association with government.
- 156 · The development of capacity within Partner communities through a planning
157 process that has lasted over a decade and involved community members in
158 negotiations, the environmental assessment, field studies and full engagement in
159 strategic decision-making about the Project. Community participation will continue
160 throughout project implementation, with involvement of these communities in
161 Partnership governance and ongoing monitoring activities.
- 162 · The provision of business opportunities for local Cree nations through direct
163 negotiation contracts. The responses to CEC Rd 1 CAC-0077 a & b document the
164 mechanisms in place through these contracts to build management capacity and
165 accumulate wealth within community-based businesses.
- 166 · Negotiating and implementing employment preference arrangements designed to
167 enhance Aboriginal employment on the Project, in conjunction with the
168 development and implementation of a \$60 million pre-Project training initiative to
169 improve the overall skills of northern Aboriginal workers prior to Project
170 development. The skills and experience gained through employment and training
171 are directly transferable to future hydro-electric developments and other projects
172 and activities in the region.
- 173 · Implementation of an extensive sturgeon stocking program that will see populations
174 increase in the greater region.

175 Outside of the Keeyask Cree Nations, the Project will also provide broader business and
176 employment opportunities for Manitoba as a whole, generating substantial labour
177 income and tax revenues. These are documented in detail for Manitoba and Canada in
178 the economic analysis provided in Appendix 3C to the Socio-economic, Resource Use
179 and Heritage Resources Supporting Volume. The Partnership will also pay a water rental
180 fee to the Province throughout the duration of the Project for use of the water at
181 Keeyask. These payments are a requirement under the *Water Power Act* and are based
182 on the amount of electricity produced at the station. It is anticipated that these rentals,
183 along with tax revenues, will be used by government for the benefit of Manitobans.

1 **REFERENCE: Volume: N/A; Section: N/A; Page No.: N/A**

2 **CEC Rd 2 CAC-0150**

3 **ORIGINAL PREAMBLE AND QUESTION (CAC-0071):**

4 Rationale In several instances the project proponent outlines principles, policies,
5 guidelines and goals for sustainable development that relate to the need to leave
6 improved equity outcomes. Two examples are

7 Government of Manitoba Guidelines for Sustainable Development –Global
8 Responsibility

9 *Guideline* – Manitobans should think globally when acting locally, recognizing
10 that there is economic, ecological and social interdependence among provinces
11 and nations, and working cooperatively, within Canada and internationally, to
12 integrate economic, environmental, human health and social factors in decision-
13 making while developing comprehensive and equitable solutions to problems.

14 *Response* – “A detailed Life Cycle Assessment was conducted by the Pembina
15 Institute in order to estimate the GHG emissions resulting from the
16 construction, land use change, operation, and decommissioning of the Project.
17 The resulting emissions are extremely low relative to other forms of generation.
18 An equivalent amount of electricity, produced by a combined cycle natural gas
19 generating station during one year of operation would result in more than
20 double the entire life cycle emissions estimated associated with the Keeyask
21 Project over a 100 year period. Since the Project will displace gas and coal
22 generation, primarily in the U.S. Midwest, it will contribute to substantial GHG
23 reductions. The Project is estimated to displace 30 million tonnes carbon dioxide
24 equivalent during the first 10 years of operation” (Keeyask HLP 2012, 9.8).

25 Manitoba Hydro’s Sustainable Development Principle – Global Responsibility:

26 *Principle* – Recognize there are no political and jurisdictional boundaries to our
27 environment, and that there is ecological interdependence among provinces
28 and nations. Consider environmental effects that occur outside of Manitoba
29 when planning and deciding on new developments and major modifications to
30 facilities and to methods of operation

31 *Response* – “The Project will contribute to substantial reductions in greenhouse
32 gases (GHG) by displacing fossil fuel electricity generation” (Keeyask HLP 2012,
33 9.15).

34 As has been previously noted, the reduction in GHG emissions is important and
 35 commendable. However, the Government of Manitoba's Guideline notes the economic,
 36 ecological and social interdependence among provinces and nations, and this
 37 interdependence requires extending considerations of equity well beyond GHG
 38 emissions.

39 The proposed Keeyask project – along with Manitoba Hydro's other projects – may
 40 present an opportunity to continue building a foundation for a more just and equitable
 41 Manitoba, from the construction phase through final use of the electricity over the long
 42 anticipated lifetime of the project. The process of striving for greater equity must begin
 43 at the planning stage. At this point, however, it is unclear what steps are being taken to
 44 promote both inter- and intra-generational equity in their various manifestations.

45 Please describe how the proposed project will promote greater equity. Please provide
 46 attention to

- 47 · the fair distribution of benefits and risks
- 48 · the fair access to resources and opportunities
- 49 · the accounting of impacts from previous developments
- 50 · the shared responsibility amongst all partners to seek equitable outcomes and
 51 processes
- 52 · the promotion of equity both between and within generations

53 **FOLLOW-UP QUESTION:**

54 **Preamble**

55 In several instances the project proponent outlines principles, policies, guidelines and
 56 goals for sustainable development that relate to the need to leave improve equity
 57 outcomes. Two examples are as follows:

58 Government of Manitoba Guidelines for Sustainable Development –Global
 59 Responsibility with the EIS Response at Keeyask HLP 2012, 9.8.

60 Manitoba Hydro's Sustainable Development Principle – Global Responsibility
 61 with the EIS Response at Keeyask HLP 2012, 9.15.

62 As has been previously noted, reduction in GHG emissions is important and
 63 commendable. However, the Government of Manitoba's Guideline notes the economic,
 64 ecological and social interdependence among provinces and nations, and this
 65 interdependence requires extending considerations of equity well beyond GHG
 66 emissions.

67 The proposed Keeyask project – along with Manitoba Hydro’s other projects – presents
 68 an opportunity to continue building a foundation for a more just and equitable
 69 Manitoba, both through the construction and operational phases of the project itself, as
 70 well as through the final use of the electricity over the long anticipated lifetime of the
 71 project. The process of striving for greater equity must begin at the planning stage. At
 72 this point, however, it is unclear what steps are being taken to promote both inter- and
 73 intra-generational equity in their various manifestations.

74 **Description of the Partnership's response**

75 The Partnership’s response to the IR is to argue that the IR is out of the scope of the CEC
 76 review, and instead this information will be discussed at the NFAT review. This response
 77 reveals an impoverished understanding of the CEC Terms of Reference

78 The CEC is tasked with incorporating “where appropriate, the Principles of Sustainable
 79 Development and Guidelines for Sustainable Development as contained in the
 80 Sustainable Development Strategy for Manitoba.” Three relevant principles, with
 81 elaborations, are reproduced below:

82 *Stewardship:*

- 83 • *The economy, the environment, human health and social well-being should be*
 84 *managed for the equal benefit of present and future generations.*
- 85 • *Manitobans are caretakers of the economy, the environment, human health*
 86 *and social well-being for the benefit of present and future generations.*
- 87 • *Today's decisions are to be balanced with tomorrow's effects.*

88 *Shared Responsibility and Understanding:*

- 89 • *Manitobans should acknowledge responsibility for sustaining the economy, the*
 90 *environment, human health and social well-being, with each being accountable*
 91 *for decisions and actions in a spirit of partnership and open cooperation.*
- 92 • *Manitobans share a common economic, physical and social environment.*
- 93 • *Manitobans should understand and respect differing economic and social*
 94 *views, values, traditions and aspirations.*
- 95 • *Manitobans should consider the aspirations, needs and views of the people of*
 96 *the various geographical regions and ethnic groups in Manitoba, including*
 97 *Aboriginal peoples, to facilitate equitable management of Manitoba's common*
 98 *resources.*

99 *Global Responsibility:*

100 • *Manitobans should think globally when acting locally, recognizing that there is*
 101 *economic, ecological and social interdependence among provinces and nations,*
 102 *and working cooperatively, within Canada and internationally, to integrate*
 103 *economic, environmental, human health and social factors in decision-making*
 104 *while developing comprehensive and equitable solutions to problems.*

105 All three of these principles of sustainable development reference equity
 106 considerations, both within and between generations. Given the potential for the
 107 proposed dam to have significant environmental, economic, social, and cultural impacts,
 108 it is imperative that the benefits and risks of the project be equitably shared. In Chapter
 109 9 of the EIS, the Partnership extolls the virtues of the proposed dam in light of
 110 sustainable development criteria. Such claims must be supported by explicit
 111 presentation of an equity effects assessment for the Keeyask project.

112 **Question**

113 Given that the Partnership declined to answer the original IR, despite it clearly being a
 114 within the scope of the CEC terms of reference, the question is reposed:

115 Please describe how the proposed project will promote greater equity. Please provide
 116 attention to

- 117 a. the fair distribution of benefits and risks
- 118 b. the fair access to resources and opportunities
- 119 c. the accounting of impacts from previous developments
- 120 d. the shared responsibility amongst all partners to seek equitable outcomes and
 121 processes
- 122 e. the promotion of equity both between and within generations

123 **RESPONSE:**

124 The Keeyask Generation Project is being developed within the context of Manitoba
 125 Hydro's overall system and consistent with the corporation's mandate in the *Manitoba*
 126 *Hydro Act* to:

127 ...to provide for the continuance of a supply of power adequate for the needs of
 128 the province, and to engage in and to promote economy and efficiency in the
 129 development, generation, transmission, distribution, supply and end-use of
 130 power (*Manitoba Hydro Act*, Section 2).

131 Based on an evaluation of, among other things, anticipated future energy demand,
 132 Manitoba Hydro has analyzed a number of alternatives and established a preferred

133 development plan for the province. The Keeyask Generation Project is one component
 134 of this overall plan, and the questions raised above will be discussed within the context
 135 of the Manitoba *Sustainable Development Act* as part of the Needs For and Alternatives
 136 To (NFAT) review. The Partnership believes that a complete understanding of the
 137 questions raised above is most appropriately reviewed and discussed within the context
 138 of NFAT. Having said that, the response below attempts to answer this question strictly
 139 within the context of Keeyask.

140 The three cited sections of the Manitoba *Sustainable Development Act* in the preamble
 141 are referenced and addressed in Chapter 9 of the Response to the EIS Guidelines.
 142 Despite what is noted in the original preamble, the discussion goes well beyond simply a
 143 reduction in greenhouse gas emissions. In this chapter, the Partnership states:

144 *“Stewardship: The economy, the environment, human health and social well-
 145 being should be managed for the equal benefit of present and future
 146 generations. Manitobans are caretakers of the economy, the environment,
 147 human health and social well-being for the benefit of present and future
 148 generations. Today's decisions are to be balanced with tomorrow's effects.*

149 The Project, by design, will provide hydroelectric energy benefits, including
 150 reduced greenhouse gas emission benefits, for many generations into the
 151 future. From a regional perspective, the KCNs have been very involved in
 152 planning the Project and in the environmental assessment and they will
 153 continue to have a direct role in the monitoring and follow-up programs.
 154 **Intergenerational benefits are a mainstay of the KCNs' decision to participate
 155 in the Partnership.** At the same time, the KCNs are equally attentive to applying
 156 their worldview to avoid and reduce environmental effects and demonstrate
 157 respect to Askiy. **Partnership income will be beneficial to generations of KCNs
 158 community Members, and will provide sustained revenues to the broader
 159 Manitoba economy.** Stewardship of the environment will continue through
 160 ongoing monitoring and follow-up programs involving KCNs communities and
 161 Manitoba Hydro, and **AEA programs will enhance the cultural identity and
 162 connection to the land of present and future generations which in turn will
 163 contribute to social well being.** [Emphasis added].

164 **Shared Responsibility and Understanding:** *Manitobans should acknowledge
 165 responsibility for sustaining the economy, the environment, human health and
 166 social well-being, with each being accountable for decisions and actions in a
 167 spirit of partnership and open cooperation. Manitobans share a common
 168 economic, physical and social environment. Manitobans should understand and
 169 respect differing economic and social the most appropriate development In
 170 order to meet this mandate, and views, values, traditions and aspirations.*

171 *Manitobans should consider the aspirations, needs and views of the people of*
 172 *the various geographical regions and ethnic groups in Manitoba, including*
 173 *Aboriginal peoples, to facilitate equitable management of Manitoba's common*
 174 *resources.*

175 The processes for developing the Project have included the **development of a**
 176 **partnership that is intended, in part, to meet the societal, cultural, economic**
 177 **and employment aspirations of the local KCNs communities, which include the**
 178 **continuation of traditional and cultural practices, as well as a deeper**
 179 **integration into the regional and provincial economy.** Discussions leading to
 180 the formation of the Partnership and the planning and environmental
 181 assessment activities have led to a growing understanding and respect for the
 182 different values, and worldviews of Manitoba Hydro and the KCNs. [Emphasis
 183 added]

184 **Global Responsibility:** *Manitobans should think globally when acting locally,*
 185 *recognizing that there is economic, ecological and social interdependence*
 186 *among provinces and nations, and working cooperatively, within Canada and*
 187 *internationally, to integrate economic, environmental, human health and social*
 188 *factors in decision-making while developing comprehensive and equitable*
 189 *solutions to problems."*

190 The Project will contribute to substantial reductions in greenhouse gases (GHG)
 191 by displacing fossil fuel electricity generation.

192 A detailed Life Cycle Assessment was conducted by the Pembina Institute in
 193 order to estimate the GHG emissions resulting from the construction, land use
 194 change, operation, and decommissioning of the Project. The resulting emissions
 195 are extremely low relative to other forms of generation. An equivalent amount
 196 of electricity, produced by a combined cycle natural gas generating station
 197 during one year of operation would result in more than double the entire life
 198 cycle emissions estimated associated with the Keeyask Project over a 100 year
 199 period. Since the Project will displace gas and coal generation, primarily in the
 200 U.S. Midwest, it will contribute to substantial GHG reductions. The Project is
 201 estimated to displace 30 million tonnes carbon dioxide equivalent during the
 202 first 10 years of operation."

203 As part of planning and assessing Keeyask, Manitoba Hydro and the KCNs have taken a
 204 fundamentally different approach than that undertaken for previous developments
 205 (with the exception of Wuskwatim). Although Manitoba Hydro and each of the KCNs
 206 have entered into settlement agreements that account for the impacts of previous
 207 developments, the Keeyask Partnership and the ensuing Keeyask Generation Project

208 would have been very difficult, if not impossible, to establish without acknowledging
209 and learning from the legacy of past developments.

210 As noted in a submission made by Manitoba Hydro at the 2010 World Energy Congress:

211 “In developing [previous] northern generating stations and the CRD and LWR
212 projects, Manitoba Hydro utilized contemporary practices of the time. These
213 practices, while consistent with government requirements and prevailing
214 societal values and expectations, involved much less consultation than would be
215 considered acceptable today. For the most part, little effort was made to
216 inform, consult or involve affected communities in the planning process.
217 Manitoba Hydro was proceeding with the type of development that society
218 perceived as being for the public good. The approach taken by Manitoba Hydro
219 evolved somewhat in the latter projects when some consultation occurred and
220 employment training programs were provided. Ultimately, this approach
221 resulted in a lack of full understanding about project effects - both within
222 communities and at Manitoba Hydro, an initially inadequate approach to project
223 mitigation and compensation, and a complete distrust of Manitoba Hydro
224 throughout Northern Manitoba. (Wojczynski *et. al.*, 2010)”

225 The Partnership approach for Keeyask is based on a desire by both Manitoba Hydro and
226 the KCNs to overcome this legacy of mistrust and to build more socially and
227 environmentally responsible projects that are a net benefit to local communities.

228 Achieving the Partnership and coming to agreement on the Partnership’s environmental
229 assessment took a considerable amount of time, energy and resources by both
230 Manitoba Hydro and the communities to build the trust and positive relationship
231 required to work together. This will continue to be a challenging, rewarding and ongoing
232 process throughout the life of the Project.

233 In undertaking its assessment, the Partnership has made extensive efforts to understand
234 the effects of previous developments and how they have shaped current environmental
235 conditions. This understanding has been aided considerably by the use of Aboriginal
236 Traditional Knowledge. It has helped the Partnership to understand how the
237 environment at Gull Lake may respond to the Keeyask development and the nature and
238 success of mitigation measures that could be applied as part of the Keeyask project.

239 The Partnership notes that a hydro-electric generating station by its very nature is
240 developed with a long-term perspective and, therefore, must consider future
241 generations. Through the environmental assessment process, the Partnership sought to
242 understand current and potential future opportunities associated with areas affected by
243 the Project. This is documented in the Resource Use sections of the Response to EIS

244 Guidelines and the Socio-economic, Resource Use and Heritage Resources Supporting
 245 Volume. Consideration has also been given the long-term community economic
 246 development plans, both in Gillam and each of the KCNs communities and how these
 247 may be influenced by Keeyask.

248 The Adverse Effects Agreements also explicitly acknowledge the lost opportunity for
 249 KCNs Members to undertake traditional customs, practices and traditions within areas
 250 affected by Keeyask. This is addressed through the offsetting programs included in these
 251 agreements that provide alternative sources of access and opportunity to pursue
 252 traditional activities.

253 As noted in response to CEC Rd 2 CAC-0149, the Partnership has committed to
 254 substantial long-term mitigation and monitoring activities. The costs of these measures
 255 have been integrated into the development and operational costs of the station and
 256 have been considered when determining whether Keeyask should be pursued as part of
 257 Manitoba Hydro's overall development plan. In this way, the Project has also been
 258 designed in a manner that avoids or minimizes adverse effects and that implicitly
 259 reduces future environmental effects and associated economic risks.

260 The Partnership has also made efforts to enhance environmental and social conditions,
 261 wherever feasible, as part of the project. For example, Lake Sturgeon populations in the
 262 Kelsey to Kettle reach of the Nelson River are small and declining – they are not
 263 considered to be sustainable on their own. This condition is the result of past harvest
 264 and hydroelectric development in the region. The Partnership has committed to
 265 improving this condition if Keeyask is built through habitat creation and an extensive
 266 stocking program. The ultimate goal is to create a self-sustaining population of sturgeon
 267 in this reach of the river – a clear enhancement over current conditions and one that
 268 head on addresses the outcomes of past development and activities.

269 Additional examples are also provided in the response to CEC Rd 2 CAC-0149, including
 270 the benefits available for both current and future generations. Opportunities to
 271 participate in the Keeyask Generation Project have been developed in a manner that
 272 enhances and reduces barriers to Aboriginal participation through the implementation
 273 of targeted training programs, employment preferences, on-site cultural awareness
 274 training and counseling, direct negotiation contracts and use of Manitoba Hydro's
 275 Northern Purchasing Policy. Employment, training and business opportunities for local
 276 KCNs communities have also been created through the technical field studies for
 277 Keeyask that have been undertaken since 1999. Operational Employment targets and
 278 related commitments implemented under the JKDA will provide opportunities for future
 279 generations to secure long-term operational employment with Manitoba Hydro. Long-
 280 term revenues from the Project will be available to future generations and can be used
 281 to undertake community and social development projects. From a financial perspective,

282 there are mechanisms within the Joint Keeyask Development Agreement that are
283 available to protect each KCN's investment in the Project and these are discussed in
284 detail in the response to CEC Rd 2 CAC-0123.

285 The Partnership believes that the efforts to develop and design Keeyask in a manner
286 that is environmentally and socially responsible, and that is inclusive and respectful of
287 local community concerns and perspectives, does provide for a fair distribution of
288 benefits and risks over the life of the Project and contributes to a more just and
289 equitable society.

290 **REFERENCES:**

291 Wojczynski, E., Cole, V. Pachal, S., Goulet, R., 2010. *MISSION: PARTNERSHIPS. A Socially*
292 *Responsible Approach for New Hydro-electric Developments*. Presented at the 2010
293 World Energy Congress in Montreal and available on the Internet at:
294 <http://www.worldenergy.org/documents/congresspapers/391.pdf>

1 **REFERENCE: Volume: N/A; Section: N/A; Page No.: N/A**

2 **CEC Rd 2 CAC-0151**

3 **ORIGINAL PREAMBLE AND QUESTION (CAC-0072):**

4 In several instances the project proponent outlines principles, policies, guidelines and
5 goals for sustainable development that relate to the long-term capacity to respond. Two
6 examples are

7 Government of Manitoba Guidelines for Sustainable Development –Stewardship

8 *Guideline* – The economy, the environment, human health and social well-being
9 should be managed for the equal benefit of present and future generations.

10 Manitobans are caretakers of the economy, the environment, human health
11 and social well-being for the benefit of present and future generations. Today's
12 decisions are to be balanced with tomorrow's effects.

13 *Response* – Stewardship of the environment will continue through ongoing
14 monitoring and follow-up programs involving KCNs communities and Manitoba
15 Hydro, and AEA programs will enhance the cultural identity and connection to
16 the land of present and future generations which in turn will contribute to social
17 well being. (Keeyask HLP 2012, 9-6).

18 Manitoba Hydro's Sustainable Development Principle – Prevention and Remedy

19 *Principle* – To the extent practical, anticipate and prevent adverse
20 environmental and economic effects that may be caused by Corporate policies,
21 programs, projects and decisions rather than reacting to and remedying such
22 effects after they have occurred. Purchase, where practical, environmentally
23 sound products taking into account the life cycle of the products. Address
24 adverse environmental effects of Corporate activities that cannot be prevented
25 by: (1) endeavouring, wherever feasible, to restore the environment to
26 predevelopment conditions or developing other beneficial uses through
27 rehabilitation and reclamation; (2) striving to replace the loss with substitutes
28 that would enhance the environment and/or associated resource uses while
29 offsetting the type of damage experienced; (3) making monetary payments for
30 compensable damages on a fair, equitable and timely basis. Give preference,
31 where practical, to projects and operating decisions that use renewable
32 resources or that extend the life of supplies of nonrenewable resources.

33 *Response* – "A number of measures have been taken to prevent and minimize
34 adverse effects, the most substantial being to reduce the size of the Project. At

35 one time, a high head project with 180 km² of initial flooding was under
 36 consideration; in contrast, the current Project that will result in 45 km² of initial
 37 flooding. As another example, a combination of habitat enhancement measures
 38 and a fish stocking program that includes a fish hatchery will enhance the
 39 population of lake sturgeon in the Project area. As another example of
 40 anticipating and remedying effects before they occur, AEAs with the KCNs were
 41 negotiated as proactive measures in advance of the development, and programs
 42 under those agreements will address effects on resource users" (Keeyask HLP
 43 2012, 9.13).

44 The responses by the project proponents are commendable. However, the responses do
 45 not sufficiently indicate the capacity of the project proponents to respond to both
 46 foreseen and unforeseen events. For example, an analysis of climate change scenarios
 47 by Manitoba Hydro forecasted an increase in average temperature by 4.1°C and an
 48 increase in precipitation of 14% by the 2080s (Manitoba Hydro 2012, iv). Such increases
 49 in temperature and precipitation will have major interacting implications for Manitoba's
 50 social, economic and ecological conditions, and for the proposed project. If only for this
 51 reason, it is imperative that a project with such a long lifespan be designed from early
 52 stages to be adaptable to change. Furthermore, it is imperative for reasons of equity
 53 and long-term ecological integrity, among other things, that sufficient resources are
 54 secured to provide future generations the ability to respond appropriately to future
 55 circumstances.

56 At this point it is unclear the extent to which the proposed project will be designed in a
 57 manner to ensure the full capacity to respond.

58 Please describe how the proposed project will ensure the long-term capacity to respond
 59 to both foreseen and unforeseen challenges and opportunities. Please provide attention
 60 to:

- 61 · the adaptability of the design
- 62 · the development of responsive monitoring and adaptive management plan
- 63 · the resources (financial and otherwise) and ability to act upon foreseen and
 64 unforeseen challenges and opportunities (esp. climate change)
- 65 · the development of appropriate baseline data
- 66 · the attention to uncertainty, including irreducible uncertainty
- 67 · the ability to avoid lock-in

68 **FOLLOW-UP QUESTION:**

69 In several instances the project proponent outlines principles, policies, guidelines and
 70 goals for sustainable development that relate to the long-term capacity to respond. Two
 71 examples are the following:

72 Government of Manitoba Guidelines for Sustainable Development –Stewardship
73 with the EIS Response at Keeyask HLP 2012, 9-6.

74 Manitoba Hydro’s Sustainable Development Principle – Prevention and Remedy
75 with the EIS Response at Keeyask HLP 2012, 9.13.

76 The responses by the project proponents are commendable, and indicate important
77 considerations of long-term management. However, the responses do not sufficiently
78 indicate the capacity of the project proponents to respond to both foreseen and
79 unforeseen events.

80 For example, an analysis of climate change scenarios by Manitoba Hydro forecasted an
81 increase in average temperature by 4.1oC and an increase in precipitation of 14% by the
82 2080s (Manitoba Hydro 2012, iv). Such an increase in temperature and precipitation will
83 have tremendous implications for Manitoba and the proposed project, through
84 changing social, economic and ecological conditions. If only for this reason, it is
85 imperative that a project with such a long lifespan be designed from early stages to be
86 responsive to change. Furthermore, it is imperative for reasons of equity and long-term
87 ecological integrity, among other things, that sufficient resources are secured now to
88 provide future generations the ability to respond appropriately to future circumstances.

89 At this point it is unclear the extent to which the proposed project has been designed in
90 a manner to ensure the full capacity to respond.

91 Description of the Partnership's response

92 The Partnership provides a lengthy response, which is commendable insofar as it
93 addresses a wide range of concerns. Within the response, however, there are some
94 areas needing further clarification.

95 First, with regards to “Resources and ability to act upon foreseen and unforeseen
96 challenges and opportunities,” the Partnership's response is the following

97 The Project proposal put forward by the Partnership provides substantial
98 commitments with respect to long-term mitigation and monitoring activities
99 through negotiated terms outlined in the Joint Keeyask Development
100 Agreement and in the KCNs Adverse Effects Agreements, as well as through
101 measures identified in the EIS. Implementation of these measures as part of
102 overall Project development means Keeyask will be constructed and operated in
103 a manner that is environmentally and socially responsible and demonstrates a
104 commitment by the Partnership to provide the resources and ability to act upon
105 foreseen and unforeseen challenges and opportunities. This, combined with the
106 extensive efforts undertaken by the Partnership to design the Project in a

107 manner that minimizes environmental effects, reduces the potential for future
108 generations to bear the costs of unsound development practices.

109 However, the Partnership has not shown how it will develop these resources. Given the
110 importance of not displacing burdens onto future generations of ratepayers and First
111 Nations, it is imperative for the Partnership to explain how it is setting aside resources
112 (financial and otherwise) to deal with these eventualities. Unfortunately, the response
113 to the IR provides no such indication of how future needs will be met by present savings
114 and planning.

115 Second, with regards to the development of appropriate baseline data, the Partnership's
116 response is the following:

117 Baseline data consists of a comprehensive multidiscipline Project-specific
118 program initiated in 2000 and in many cases continuing until Project
119 Construction, which has been adapted over time based on review of relevant
120 literature and feedback from the general public, affected in-vicinity Aboriginal
121 communities, regulators and peer reviewers.

122 This response provides little elaboration about the baseline data. For example, it is not
123 even certain whether the year 2000 has been chosen as the standard baseline and why
124 this might be appropriate. Given the historical impacts of hydro development on
125 Keeyask Cree Nations, there have been calls for the baseline to be set at pre-
126 development times. Furthermore, the response provides no mention of where further
127 information on baseline data can be sought.

128 Third, with regards to "ability to avoid lock-in", the Partnership's response is the
129 following:

130 The design of the generating station permits it to operate efficiently using
131 different modes of operation. This will allow the station operation to adapt to
132 potential changes to inflow conditions because of climate change. The design
133 will also allow the station to adapt to varying demands of Manitoba Hydro's
134 Integrated Power System which may also change due to climate change or other
135 factors. When using the different modes of operation, the station will operate
136 efficiently without the reservoir level deviating outside of the 1 m operating
137 range. By turning units on and off in response to changing inflow and power
138 demand requirements, the vertical-shaft fixed-blade units could be operated at
139 or near peak efficiency under nearly all flow conditions.

140 This response addresses some very basic concerns about lock-in but neglects the larger
141 issue that a hydro dam is effectively irreversible, and Manitoba is effectively locked into
142 a new ecological system in the project area with its consequent social, ecological,

143 economic, cultural, etc. effects. Likewise, if the dam is built, there will be pressure to
 144 produce and consume as much electricity as the dam can generate so as to ensure
 145 economic viability, potentially leading to oversupply and wasteful consumption of
 146 electricity.

147 Question

148 In elaborating on your earlier reply discussing how the proposed project will ensure the
 149 long-term capacity to respond to both foreseen and unforeseen challenges and
 150 opportunities, please provide additional consideration to:

- 151 a. the resources (financial and otherwise) and ability to act upon foreseen and
 152 unforeseen challenges and opportunities (esp. climate change), and how these
 153 resources will be secured;
- 154 b. the development of appropriate baseline data; and,
- 155 c. the extent to which the proposed project avoids lock-in and irreversibility, and
 156 allows for supply and demand to increase incrementally and in response to one
 157 another in an appropriate manner.

158 **RESPONSE:**

159 *Part A – Provide additional consideration to the resources (financial and otherwise) and*
 160 *ability to act upon foreseen and unforeseen challenges and opportunities (esp. climate*
 161 *change), and how these resources will be secured.*

162 Section 8.3 of the Response to EIS Guidelines summarizes how the Project
 163 Environmental Protection Program will be implemented. A key point is that
 164 implementing the measures described in the program will be a regulatory/legal
 165 requirement of the Project approval that will include regular reporting and regulatory
 166 oversight. This section also describes the selection and oversight of contractors to
 167 implement the various programs from construction through operation phases, including
 168 the establishment of work plans, budgets and contracts.

169 The expertise and level of effort applied to the Project planning and assessment,
 170 including input from public, regulatory and peer review processes provides a reasonable
 171 level of comfort that the likely effects have been identified, characterized/quantified
 172 and mitigated. As a Crown Corporation, Manitoba Hydro is committed to managing
 173 foreseen and unforeseen effects on a long-term basis.

174 With regard to climate change, specifically, it is recognized that climate change could
 175 have implications for Manitoba and the region. While the Response to EIS Guidelines
 176 does not assess the overall effects of climate change to Manitoba as a whole, it does
 177 assess the implications of potential climate change on the Project (Section 6.9), where it
 178 is found that the Project is very robust to responding to climate change. The assessment

179 also considered the effects of the Project on the environment (including climate, in
 180 Section 6.3.3) where it is found that the Project will contribute to a reduction in global
 181 greenhouse gas emissions. The Response to EIS Guidelines also considers the sensitivity
 182 of assessment conclusions to climate change (Section 6.3), and found that the
 183 conclusions related to effects assessment do not change as a result of climate change
 184 (e.g., increases in temperature and precipitation).

185 *Part B – Provide additional consideration to the development of appropriate baseline*
 186 *data.*

187 The development of baseline data included an analysis of all relevant information
 188 available from the past, including ATK, government studies, and previous Manitoba
 189 Hydro studies in the area. Keeyask-specific scientific studies for the Project's
 190 environmental assessment were initiated in 2000. This date also coincided with the
 191 initiation of the Stage IV planning process (as described in Section 6.3.3 of the Project
 192 Description Supporting Volume - PDSV). While information from previous studies was
 193 used as much as feasible, the studies initiated in 2000 established a data set with
 194 consistent methodologies allowing more rigorous/comparable analyses and assessment.
 195 Each of the KCNs has also undertaken its own community-based studies to document
 196 community perspectives, concerns, aspirations and ATK related to the Project. The
 197 result is more than 10 years of data gathering prior to development of the Response to
 198 EIS Guidelines and a commitment to continue to gather baseline information until
 199 construction starts. This baseline information includes not only the scientific studies but
 200 documentation of ATK through community-based studies that reflects past and current
 201 conditions.

202 In terms of reporting and communicating the results of monitoring, as described in
 203 Section 8.3.1.3 of the Response to EIS Guidelines:

204 *"In fulfillment of the Project Environment Act licence and Fisheries Act authorization*
 205 *requirements, reports will be submitted by Manitoba Hydro (on behalf of the*
 206 *Partnership) to Manitoba Conservation and Water Stewardship and Fisheries and*
 207 *Oceans Canada in accordance with the schedule outlined in these approvals. Reports*
 208 *that will be prepared include:*

- 209 • *A compliance monitoring report in connection with the EnvPP;*
- 210 • *Technical reports of the activities and results of the monitoring plans including the*
 211 *outcomes of both ATK and western scientific monitoring; and*
- 212 • *In addition to the reports prepared for the regulator a summary document of all*
 213 *monitoring activities will be prepared annually by the Partnership for the KCNs and*
 214 *the general public."*

215 These monitoring reports will include a summary of and comparison to baseline
216 monitoring and will be available on the Partnership's website (<http://keeyask.com>).

217 *Part C - Provide additional consideration to the extent to which the proposed project*
218 *avoids lock-in and irreversibility, and allows for supply and demand to increase*
219 *incrementally and in response to one another in an appropriate manner.*

220 The Keeyask Generating Station will effectively be locked into the Project area because
221 it is planned to be in place for many decades, perhaps more than 100 years (see
222 Response to EIS Guidelines PDSV Section 5.0). The changes to the environment caused
223 by the Project will persist over this period and a new local ecological system will become
224 established. For these reasons, the Partnership has spent several decades planning the
225 Project and put measures in place to mitigate, remediate and/or compensate for Project
226 effects, with the intent of a net result for the Project to produce substantial long term
227 environmental, social and economic benefits. Section 6.0 of the PDSV summarizes the
228 process of planning and designing the Project. The various stages of planning span more
229 than 50 years, with each stage involving the gathering of engineering and environmental
230 information and gradually defining the Project and its location. Mitigation and
231 alternative means to design the Project and incorporate measures to minimize
232 environmental effects are part of the process but eventually components must be
233 "locked in". Due to the nature of the Project - i.e., large expensive
234 concrete/steel/earthen structures that take years to construct involving complex
235 coordination – irreversible decisions must be made. Adaptability to deal with foreseen
236 and unforeseen changes has been integrated into the Project planning and design. CEC
237 Rnd 1 CAC-0072 provided examples of adaptability such as the mode of operations, as
238 well as adaptable compensation measures, i.e., things that can be added to the Project
239 to deal with adverse effects, if required, based on monitoring. The commitment to
240 monitor, communicate and facilitate regulatory oversight is described above.

241 With respect to supply and demand, Section 4.2 of the Response to EIS Guidelines
242 indicates that Manitoba Hydro will purchase the energy produced by the Keeyask
243 Hydropower Limited Partnership to meet its mandate under the *Manitoba Hydro Act*.
244 Manitoba domestic load is growing resulting in the need for new power resources when
245 considering just the load growth from Manitoba customers and not including any new
246 export contracts. At times, Keeyask will generate more energy than would be required
247 in Manitoba alone but Manitoba Hydro does enter into export contracts, as per its
248 mandate, so some power from Keeyask may be exported outside of Manitoba. An
249 analysis of supply and demand will be reviewed and discussed as part of the Needs For
250 and Alternatives To (NFAT) review of Manitoba Hydro's preferred development plan
251 currently being undertaken by the Public Utilities Board (PUB) at the request of the

252 Manitoba government. CEC Rd 1 CAC-0067 includes the terms of reference for the NFAT
253 review and indicates that the analysis of supply and demand will be reviewed.

1 **REFERENCE: Volume: N/A; Section: N/A; Page No.: N/A**

2 **CEC Rd 2 CAC-0152**

3 **ORIGINAL QUESTION AND PREAMBLE (CAC-0073):**

4 Rationale In several instances of the EIS, the proponent argues the proposed project is
5 promoting sustainable development by avoiding the GHG emissions from the coal-fired
6 and natural gas-fired electricity that would otherwise be providing the electricity (e.g.,
7 Keeyask HLP 2012, 9.4 and 9.8). The amount of GHG offsetting is both significant and
8 commendable. However, there are certain issues that add complexity to the matter.

9 First, it is not clear that the electricity produced by the proposed Keeyask project will
10 replace existing electricity demand or facilitate additions to it (i.e. it is latent demand). If
11 the goal is to promote sustainable development by reducing GHG emissions, it is
12 important to ensure the project effects will reduce overall GHG emissions from current
13 levels, as opposed to reducing the rate of increase of GHG emissions. Meeting the
14 higher test of reducing current GHG emissions requires a proactive approach, but one
15 that is within the potential of an electricity provider as important and large as Manitoba
16 Hydro.

17 Second, it is not clear how the anticipated GHG displacement attributable to the
18 proposed project compares with alternatives to the project, such as enhanced
19 conservation options and energy efficiency. It may be that increased generating capacity
20 is not the preferred means of reducing GHG emissions in both the near term (e.g. the
21 upfront GHG emissions related to the flooding and construction of the dam) and the
22 long-term.

23 Please elaborate further on how the proposed project will reduce GHG emissions in
24 both the near-term and long-term. Please provide attention to:

- 25 · the extent to which the proposed project would be replacing existing coal-fired and
26 natural gas-fired supply, or adding to that supply
27 · the extent to which the project would help to support rather than compete with
28 demand management efforts and options
29 · how the GHG emissions reduction of the proposed project compare with
30 alternatives to the project (e.g. conservation and efficiency)

31 **FOLLOW-UP QUESTION:**

32 In several instances in the EIS, the proponent argues that the proposed project would
33 promote sustainable development by avoiding the GHG emissions from the coal-fired
34 and natural gas-fired electricity that would otherwise be providing the electricity (e.g.,

35 Keyask HLP 2012, 9.4 and 9.8). The amount of GHG offsetting is both significant and
36 commendable. However, there are certain issues that add complexity to the matter.

37 First, it is not clear that the electricity produced by the proposed Keyask project will
38 replace existing electricity demand or facilitate additions to it (e.g. by meeting latent
39 demand). If the goal is to promote sustainable development by reducing GHG emissions,
40 it is important to ensure that the project will ensure reduction of overall GHG emissions
41 from current levels, as opposed to reducing the rate of increase of GHG emissions.
42 Meeting the higher test of reducing current GHG emissions requires a proactive
43 approach, but one that is within the potential of an electricity provider as important and
44 large as Manitoba Hydro.

45 Second, it is not clear how the anticipated GHG displacement of the proposed project
46 compares with GHG displacement that could be achieved by alternatives to the project,
47 such as enhanced conservation options and energy efficiency. It may be that increased
48 generating capacity is not the most effective means of reducing GHG emissions in the
49 near term (e.g. the upfront GHG emissions related to the flooding and construction of
50 the dam) and the long-term.

51 **Description of response**

52 The Partnership provides an initial response by noting (as is reported in the EIS) that the
53 project will be displacing coal and natural gas, and that there are tremendous
54 greenhouse gas mitigation benefits to the project compared with coal and natural gas.
55 Furthermore, the Partnership references Figure 2.4-2 in the physical environment
56 supporting document that compares the proposed dam to coal, gas, nuclear and wind in
57 terms of lifecycle greenhouse gas emissions. Unfortunately, the Partnership refuses to
58 provide further discussion of alternatives, postponing that discussion to the NFAT
59 assessment.

60 While the Partnership's response provides some clarity, its unwillingness to address the
61 questions involving alternatives in the EIS is problematic for several reasons. First, the
62 CEAA guidelines clearly require the EIS to include a discussion of alternatives to the
63 project {CEAA, 2012 #2582, p. 10}:

64 The EIS must include an analysis of alternatives to the Project which describe
65 functionally different ways to meet the project need and achieve the project
66 purpose from the perspective of the proponent. Analysis of "alternatives to" a
67 project should validate that the preferred alternative is a reasonable approach
68 to meeting need and purpose.

69 Second, the EIS is wholly inconsistent with regards to the discussion of alternatives. In
70 several instances, such as was noted above concerning Manitoba Hydro's response to

71 this IR, the EIS includes discussion of the greenhouse gas emissions of the proposed dam
 72 in comparison those of with alternatives (coal, natural gas, wind and nuclear). However,
 73 this comparison is irrelevant if coal, natural, wind and nuclear are not alternatives to the
 74 project. And if they are considered alternatives to the project, no reason is provided for
 75 the omission of other forms of generation (e.g. solar, bioenergy) as well as conservation
 76 and demand management.

77 Ultimately, it is clear that for the purpose of the CEC review there are important
 78 considerations raised by the proposed project that require the comparative evaluation
 79 of alternatives. Manitoba Hydro's current approach of discussing alternatives when it
 80 shows the proposed project in a positive light (i.e. with regards to estimated greenhouse
 81 gas emissions) and hiding from discussions of alternatives in all other instances hinders
 82 the decision-making process and omits information and analysis that is clearly necessary
 83 for the CEC panel.

84 **Request for additional information**

85 Based on Manitoba Hydro's response to the IR, we request the question be posed again:

86 Please elaborate further on how the proposed project will reduce GHG emissions in
 87 both the near-term and long-term. Please provide attention to:

- 88 a. the extent to which the proposed project is replacing existing coal-fired and natural
 89 gas-fired demand, or adding to that demand
- 90 b. how the GHG emissions reduction of the proposed project compare with reductions
 91 that could be achieved by alternatives to the project (e.g. conservation and
 92 efficiency)?

93 **RESPONSE:**

94 The Partnership has addressed (a) within the response provided to CEC Rd 1 CAC-0073.

95 Question (b) relating to alternatives to the Project, as well as the implications of
 96 demand reductions will be components of the "Needs For And Alternatives To" process.

97 These issues are beyond the scope of this CEC process.

1 **REFERENCE: Volume: N/A; Section: N/A; Page No.: N/A**

2 **CEC Rd 2 CAC-0153**

3 **ORIGINAL PREAMBLE AND QUESTION (CAC-0003, CAC-0031 and**
4 **CAC-0036):**

5 **CAC-0003**

6 On page 7-10 of Section 7.2.6.2 (Terrestrial Environment), some elements in the
7 following passage are unclear: "Benchmark values for intactness indicated a low
8 magnitude adverse effect where core area, as a percentage of land area, is greater than
9 65%, a moderate magnitude adverse effect where core area percentage is between 45%
10 and 65%, and a high magnitude adverse effect where core area percentage is lower than
11 % ... Benchmark values for intactness indicated a low magnitude adverse effect where
12 less than 35% of the range is undisturbed, a moderate magnitude adverse effect when
13 35% to 45% of the range is undisturbed, and a high magnitude adverse effect when
14 more than 45% of the range is disturbed ..."

- 15 • In the first sentence, please confirm that the final percentage value, which is
16 missing, is 45%
- 17 • In the second sentence, please confirm that "undisturbed" should be replaced with
18 "disturbed".

19 **CAC-0031**

20 The HHRA assumed that people would eat whitefish, walleye and northern pike three
21 times per week.

22 Please explain how the health risks would change if a person would eat walleye three
23 times in a week, but the other types of fish for the remainder of the week?

24 **CAC-0036:**

25 Entrainment of fish through turbines has been proposed as a reasonable method of
26 providing downstream passage for fish. Measures have been taken by the proponent to
27 reduce mortality associated with injury and mortality. Trash racks will exclude the
28 largest of fish. The turbine design is expected to result in 90% survival in fish greater
29 than 500 mm in length.

- 30 • Given that most adult lake sturgeon can be expected to pass through the trash
31 racks, and that most of these will be in the 800 to 1200 mm range (considerably
32 larger than 500 mm), and given that in general the risk of injury is greater for larger
33 fish, can it really be expected that a considerable portion of these (very important)
34 individuals will not be injured or killed?

- 35 • Given that this proportion is unknown, please give detailed information on the
 36 planned monitoring program for establishing injury and mortality rates for large fish
 37 that are expected to pass through the trash racks.

38 **FOLLOW-UP QUESTION:**

39 The strategy chosen by the proponents for downstream passage of fish is via the
 40 turbines and spillways. Although efforts can (and have) been made to design these
 41 structures to minimize injury and mortality to fish, the bottom line is that they are not
 42 actually meant to safely pass fish downstream. That said, a survival rate of 90% for fish
 43 smaller than 500 mm (a number determined by relatively rigorous empirical
 44 experimentation) seems reasonable, given that this size would encompass most of the
 45 range for most of the “non-sturgeon” VEC species, northern pike being a notable
 46 exception. The strategy also seems reasonable, given that there are decent numbers of
 47 non-sturgeon VEC’s in the affected area. However, the same cannot be said for lake
 48 sturgeon. Literally all of the spawning adults that encounter the turbine intakes will be
 49 passed through and potentially killed at an expected (not empirically determined for
 50 sturgeon) rate as high as 45% and potentially more for large spawning-sized fish. In
 51 addition, there is a great degree of uncertainty associated with almost all aspects of this
 52 mitigation strategy.

53 Work at Slave Falls suggests that adult lake sturgeon can be expected to encounter the
 54 upstream side of a dam and become entrained; however, factors that impact this
 55 proportion are unknown and encounter rates are likely quite variable. The probability of
 56 trash rack impingement is unknown (just because a fish will fit between the bars doesn’t
 57 automatically mean they will pass through the trash rack), as is the fate of impinged fish,
 58 as is the true injury and mortality rate of lake sturgeon passing through the turbines.
 59 Much of the same can be said for spillway passage. As such, the planned approach
 60 cannot reasonably be called a “safe passage” strategy for adult lake sturgeon. It is more
 61 like a mitigation program for entrainment.

- 62 • In any case, the issue that really needs to be addressed is that, given the above
 63 arguments, are the risks and uncertainties worth the “reward” (i.e. downstream
 64 passage)? Are the benefits of passing lake sturgeon downstream worth the risks in
 65 this severely depleted population?
- 66 • These questions lead to a more basic question. What are the benefits of providing
 67 downstream passage?
- 68 • The response to CEC-0031 included the statement “The study (carried out by the
 69 fish passage team) concluded that as a result of high uncertainty associated with the
 70 success of current downstream passage options, and because the Keeyask turbine
 71 designs had been modified to reduce mortality rates of fish passing through them,
 72 the best available approach to downstream fish passage would be through the

- 73 turbines (and spillway, when in operation).” Was there any discussion as to whether
 74 downstream passage was really needed for all the species?
- 75 • Given that adult lake sturgeon are by far the most at risk to be injured or killed via
 76 entrainment or impingement, is it not more reasonable to selectively exclude them
 77 by reducing bar spacing in the trash racks and/or installing species-specific structural
 78 or behavioural guidance systems?
 - 79 • Cannot connectivity (for whatever it might be worth) for this species be maintained
 80 simply by manually moving a few adults downstream yearly during the existing trap
 81 and transport program? This would conceivably result in the lowest chance of adult
 82 mortality (~0%) and the highest (~100%) chance that migration would not only occur
 83 in one direction. The proponents are asked to comment in detail on the above
 84 discussion.

85 **RESPONSE:**

86 For clarity, it is assumed that this IR is in reference to CEC Rd 1 CAC -0036, and that the
 87 first part of the pre-ambule was included in error.

88 The Partnership would like to note the following with respect to points raised in the
 89 follow-up question:

- 90 • The Partnership agrees with the comments regarding uncertainty as to the fate of
 91 adult Lake Sturgeon encountering the generating station and mortality/injury
 92 related to trashracks, turbines and spillway. As noted in CEC Rd 1 CAC-0036,
 93 mortality rates for Lake Sturgeon passing by turbines and the spillways has not been
 94 experimentally determined; however, of 10 (albeit a small sample size) Lake
 95 Sturgeon marked with acoustic tags that are known to have passed a generating
 96 station on the lower Nelson River, at least 9 survived (fish at the time of tagging
 97 ranged in size from 595 to 895 mm fork length, see TAC Public Rd 1 DFO-0050).
 98 Whether the tenth fish was impinged on trashracks, perished during passage, or the
 99 tag failed is not known.
- 100 • As noted in CEC Rd 1 CAC-0036, the proportion of the population passing the
 101 generating station is small, reducing the potential for population level effects due to
 102 losses during passage by the generating station.
- 103 • Sturgeon populations persist in many environments downstream of generating
 104 stations (e.g., Winnipeg River, Nelson River downstream of the Limestone Forebay)
 105 suggesting that the reduction in immigrants from upstream due to the presence of
 106 the generating station and losses due to mortality during passage are not sufficient
 107 to cause the population to decline.
- 108 • The Partnership agrees that passage via the turbines cannot be considered a “safe
 109 passage” strategy for adult Lake Sturgeon Passage through the turbines is targeted
 110 for fish of less than 500 mm in length, which will comprise the majority of fish

111 moving downstream. Larger fish, such as adult Lake Sturgeon, have the swimming
112 ability to avoid entrainment in the intake flow at the turbines. It is recognized that
113 larger fish, including most adult Lake Sturgeon, actively seeking to move
114 downstream could still pass by the trash racks and be at risk of injury/mortality
115 during passage by the turbines.

116 It is correct that there is uncertainty with respect to the benefit of providing
117 downstream passage. During initial discussion with Fisheries and Oceans Canada (DFO)
118 on the topic of fish passage, DFO identified the need to include upstream fish passage in
119 the Project design to maintain existing connections among fish populations. This reflects
120 a precautionary approach with respect to uncertainty regarding the importance of
121 maintaining connections among populations (see AE SV 5.4.2.3.5, Appendix 1A Section
122 1a.3.2.1.3 for further information). In subsequent discussions, the approach was
123 modified to incorporate an information gathering phase post-Project to address the
124 uncertainty with respect to the benefit of providing fish passage (either upstream or
125 downstream). This approach is described in CEC Rd 2 CEC-0091.

126 The Information Request asks whether a better option may be to prevent downstream
127 movement of Lake Sturgeon through the generating station, and avoid the risk of
128 turbine mortality, by excluding them by reducing trash rack spacing and/or installing
129 species-specific structural or behavioral guidance systems. A reduction in spacing of
130 trash racks was considered as a potential mitigation measure, but reduced spacing also
131 increases the risk of impingement of smaller fish that form the large majority of fish
132 moving downstream (see AE SV Appendix 1A Attachment 2). All fish that become
133 permanently trapped on trash racks will die, compared with mortality of only a fraction
134 of fish that move past the turbines. As discussed in CEC Rd 2 CEC-0100, effective
135 guidance systems have not been identified for rivers the size of the Nelson River with a
136 mixed fish species assemblage. However, if results of movement and turbine effects
137 monitoring described in CEC Rd 1 CAC-0036 indicate that mortality and injury create a
138 risk to maintaining sustainable fish populations, including Lake Sturgeon, then
139 appropriate mitigation methods will be investigated.

140 The Information Request notes that an alternate method of maintaining connectivity for
141 Lake Sturgeon would be to manually move a few adults downstream each year. It is
142 correct that there are alternate methods of maintaining connectivity; however, in the
143 initial decades of station operation, the populations upstream and downstream of the
144 generating station will be genetically the same since both will be stocked with hatchery
145 fish raised from the same source of brood stock (Birthday Rapids). In addition,
146 connectivity between the upstream and downstream environments will always be
147 maintained by the movement of a few sturgeon, as has been documented in tagging
148 studies conducted to date.

1 **REFERENCE: Volume: N/A; Section: N/A; Page No.: N/A**

2 **CEC Rd 2 CAC-0154**

3 **ORIGINAL PREAMBLE AND QUESTION (CAC-0040):**

4 "It is important to note that lake sturgeon year class strength and the proportion of
5 hatchery reared versus wild fish that comprise each year class will be monitored
6 annually."

7 If it is decided that an evaluation of the success of larval stocking cannot be realistically
8 monitored, should they ever be used in stocking, given that it will not be possible to
9 distinguish a wild fish from one that was stocked as a larvae?

10 **FOLLOW-UP QUESTION:**

11 More clarification is needed regarding the use of larval lake sturgeon in the proposed
12 mitigative stocking program. Although research into the issue of identifying wild and
13 stocked fry and fingerlings is a worthy endeavour, it is highly unlikely to produce usable
14 results for larval fish. Isotopic differences will NOT be apparent because the food source
15 for both wild and domestic fish will be the same (i.e. the yolk sac). And, even if there
16 were isotopic differences at stocking, they would be completely masked in an older fish.
17 If stable isotopes are a promising avenue of investigation for identifying hatchery fish,
18 more information on how this might occur is needed. Furthermore, the proponents
19 suggest that "wasting" fish by euthanizing them does not make sense, and I would
20 agree. But I would also strongly suggest that stocking them with a low chance of being
21 able to identify them with certainty makes even less sense if year class strength and
22 (more importantly) the relative contribution of stocked fish to the population is to be
23 evaluated. Essentially, this evaluation cannot be made if fish are being introduced that
24 cannot reliably be identified as wild or hatchery, which is a serious problem for the
25 evaluation process. Money spent on genetic tests would be better spent on rearing
26 more fish to a larger size, while excess fish could easily be stocked in other areas of the
27 province where stocking has been done without regard for genetic source (e.g.
28 Assiniboine River).

29 • The proponents are asked to comment in detail on the suggestion that:

30 Although research into the issue of identifying wild and stocked fry and fingerlings is
31 a worthy endeavour, it is highly unlikely to produce usable results for larval fish.
32 Isotopic differences will NOT be apparent because the food source for both wild and
33 domestic fish will be the same (i.e. the yolk sac). And, even if there were isotopic
34 differences at stocking, they would be completely masked in an older fish. . . .

35 Stocking them with a low chance of being able to identify them with certainty makes
 36 even less sense if year class strength and (more importantly) the relative
 37 contribution of stocked fish to the population is to be evaluated. Essentially, this
 38 evaluation cannot be made if fish are being introduced that cannot reliably be
 39 identified as wild or hatchery.

40 - Please provide your views on the suggestion that:

41 ...significant emphasis should be put on holding as many fish as possible through the
 42 winter. Fall stocking involves placing very small fish (~15 cm) in resource scarce
 43 habitat that will remain so for many months. Stocking programs in the south (e.g.
 44 Wisconsin) are poor comparisons because fish in the fall are much larger (~25 cm)
 45 and the habitat more productive. Sturgeon stocked in the spring will be larger and
 46 they will be stocked into much more productive habitat, and success will reflect this.

47 - Please provide your plans for initial proportions of yearling and fingerling stocking
 48 and plans to maximize that proportion (if any) for the former group.

49 **RESPONSE:**

50 It is not the intent to assess stable isotopic signature from diet, but to mark the hatchery
 51 reared fish with enriched stable isotopes of ^{86}Sr and ^{137}Ba . These unique marks are
 52 known to be deposited in hard structures, such as fin rays, and Manitoba Hydro is
 53 currently funding research to assess the long term viability of using such unique
 54 signatures to batch mark larval fish for stock enhancement purposes.

55 The introduction of fish that cannot be subsequently identified by the stage that they
 56 are reintroduced will be minimized to the extent possible; however, as discussed below,
 57 regulators may require that a greater portion of stocked fish are introduced at younger
 58 life stages. As noted by the reviewer, genetic tests can be used to identify stocked
 59 versus wild fish; given the cost of these tests, the sample size of unmarked fish that are
 60 analyzed would be kept to a minimum and restricted to years when a large number of
 61 fry are released and a strong year class consisting of a substantial number of unmarked
 62 fish is observed.

63 The reviewer is correct in noting that the survival of fingerling fish in the Nelson River
 64 may be substantially lower than in more southern areas; as noted previously, results
 65 from the stocking done by the Nelson River Sturgeon Board at Sea Falls support this
 66 observation.

67 The plans for the proportion of yearling and fingerling fish that will be stocked at specific
 68 locations will be developed in close consultation with DFO and MCWS and, ultimately,
 69 depend on Fish Handling permits issued by MCWS. The advantages of stocking yearling
 70 fish in terms of survival will be considered in terms of concerns raised by DFO and

71 MCWS that stocking older fish will create a population more suited to rearing in a
72 hatchery setting than the wild. In addition, the potential for disease transmission is
73 greater in fish that are reared for a longer period in a hatchery. Another key
74 consideration will be the suitability of habitat for different life stages, in particular, in
75 the newly formed reservoir where habitat for young-of-the-year may not initially be
76 available.

1 **REFERENCE: Volume: N/A; Section: N/A; Page No.: N/A**

2 **CEC Rd 2 CAC-0155**

3 **ORIGINAL PREAMBLE AND QUESTION (CAC-0040):**

4 "It is important to note that lake sturgeon year class strength and the proportion of
5 hatchery reared versus wild fish that comprise each year class will be monitored
6 annually."

7 If it is decided that an evaluation of the success of larval stocking cannot be realistically
8 monitored, should they ever be used in stocking, given that it will not be possible to
9 distinguish a wild fish from one that was stocked as a larvae?

10 **FOLLOW-UP QUESTION:**

11 Given the importance of stocking to the overall mitigation strategy for lake sturgeon,
12 the best possible program should be employed. The best programs involve stocking the
13 largest fish possible, and marking ALL stocked fish with long term individually
14 identifiable tags like passive integrated transponders. This allows for a rigorous
15 evaluation of the program and an indication of relative contribution from wild and
16 hatchery sources. The least effective hatchery program involves stocking small fish that
17 cannot be tracked, meaning that it is always uncertain whether or not the program is
18 working. Clearly, some programs fall in between these extremes.

19 Please comment on this suggestion that the proponents build a program with two
20 priorities:

- 21 1. stock the largest fish possible and emphasize practices and research programs that
22 facilitate this goal and
- 23 2. Mark all stocked fish such that they can be positively identified over the long term
24 for evaluation purposes.

25 **RESPONSE:**

26 The Partnership agrees that, given the importance of the stocking program for Lake
27 Sturgeon as part of the overall mitigation strategy for the goal should be to implement
28 the "best" possible program. However, the "best" program will reflect the outcome of
29 various requirements. For example, as discussed in CEC Rd 2 CAC-0154, DFO and MCWS
30 have raised concerns that stocking older fish will create a population more suited to
31 rearing in a hatchery setting than in the wild. In addition, because fish are reared in high
32 densities, the potential for stock losses due to endemic pathogens is greater in fish that
33 are reared for a longer period in a hatchery. As highlighted by the reviewer, the greater
34 survival of yearling versus fingerling fish (at least based on initial monitoring results)

35 supports the release of older fish, in particular, if relatively few fish are reared in the
36 hatchery in a given year or from a given brood stock. Another key consideration is the
37 suitability of habitat for different life stages, in particular, in the newly formed reservoir,
38 where habitat for young-of-the-year may not initially be available and stocking older fish
39 may be the only option.

40 The Partnership recognizes the importance of marking stocked fish, in particular during
41 the early years of the program when survival of stocked fish is uncertain, and is aware
42 that methods such as passive integrated transponders (PIT) tags can cost-effectively be
43 applied to several thousand fish annually. However, the scale of the stocking program
44 will not be limited by the number or size of fish that can be effectively tagged and, in the
45 long term, tagging of all or the majority of released fish may no longer be required once
46 survival has been demonstrated.

1 **REFERENCE: Volume: N/A; Section: N/A; Page No.: N/A**

2 **CEC Rd 2 CAC-0156**

3 **ORIGINAL PREAMBLE AND QUESTION (CAC-0041):**

4 Stocking is the key mitigative strategy proposed by the proponent to offset lake
5 sturgeon losses due to the Project and bolster the populations. The proponents should
6 be commended for the scope of the research that has been invested in, and in terms of
7 their willingness to incur costs associated with rearing lake sturgeon. However, the
8 proponents have understated the difficulties associated with rearing this species in
9 Manitoba, even once the obstacles of getting viable gametes has been surmounted.
10 Although lake sturgeon appear easy to rear in facilities like the White Rose Hatchery in
11 Wisconsin, the hatchery workers at Grand Rapids (and others who have tried), even
12 with years of experience, will readily admit to massive and inexplicable die offs of fish
13 without warning. Survival rates have been wildly erratic over the past decade and
14 complete losses of cohorts have not been uncommon.

15 Please comment on the uncertainty associated with rearing success of lake sturgeon,
16 and how that relates to stocking as a mitigative strategy.

17 **FOLLOW-UP QUESTION:**

18 Given the acknowledged uncertainties and challenges associated with lake sturgeon
19 rearing, do the proponents have a plan to deal with a worst case scenario (i.e. several or
20 many consecutive years of rearing failure)?

21 **RESPONSE:**

22 As noted in CEC Rd 1 CAC-0041, the long term (25 years or longer) nature of the
23 proposed stocking program and the longevity of Lake Sturgeon means that a few
24 missing year classes of stocked fish will not preclude the long term success of the
25 program for the recovery of Lake Sturgeon. It should be noted that natural recruitment
26 in Lake Sturgeon populations is also quite variable and appears particularly erratic for
27 the depressed population in Gull and Stephens lakes. Intensive monitoring for young
28 sturgeon in Gull and Stephens lakes has been conducted since 2008. In 2008, young-of-
29 the-year sturgeon were captured in an area of suitable habitat in the northern channel
30 of Gull Lake. The 2008 year class has been observed in subsequent years in surveys
31 conducted in both Gull and Stephens lakes. However, few, if any, fish in other year
32 classes have been observed, indicating that recruitment is absent or marginal in most
33 years (more information on the current status of Lake Sturgeon populations in the
34 Kesley to Kettle GS reach of the Nelson River is provided in CEC Rd 1 CEC-0031 p. 7-14).

35 Although it is expected that stocking will greatly increase the frequency of successful
36 recruitment, any improvement over the natural condition would benefit the population.

37 Manitoba Hydro has been working to identify methods to improve spawn collection and
38 rearing success in the hatchery for several years. Since Manitoba Hydro assumed
39 staffing at Grand Rapids Hatchery in 2012, new biosecurity and fish husbandry protocols
40 have been implemented and the entire fish rearing infrastructure is being modernized
41 to the same degree as facilities such as Wild Rose Hatchery in Wisconsin. It should be
42 noted that spawn collection on the Nelson River is more challenging than at many of the
43 southern locations where stocking programs are conducted due to the remoteness of
44 the spawning sites; this has required development of site-specific protocols through
45 multiple years of trials. With respect to rearing in the hatchery, it should be noted that
46 shipping gametes/larval fish to an established hatchery in the United States is not an
47 option due to restrictions on the cross-border transport of live fish, necessitating
48 development of local expertise.

49 The following is a partial list of potential problems and solutions:

50 1. No source broodstock due to overall low population numbers:

- 51 · Identify the next closest genetic line with sufficient brood stock (this would be
52 conducted in consultation with DFO and MCWS);
- 53 · Once the program is established, target at least two spawning locations yearly to
54 decrease likelihood of a completely lost rearing year due to insufficient brood stock;
55 and
- 56 · Maintain a subsample of juveniles from each population (when successful) in
57 outdoor circular tanks for continued grow-out. In unsuccessful years, some of these
58 larger individuals from that population could be sent out.

59 2. Poor fertilization/hatch due to unknown causes (potential causes include poor
60 gamete quality, disruption during transportation to hatchery, etc.):

- 61 · Determine egg stage/milt quality prior to fertilization;
- 62 · Target multiple males and females to increase numbers of families produced and
63 probability of good gamete quality;
- 64 · Continue to improve shipping procedures (e.g., transport by air versus land and
65 water);
- 66 · Maintain subsample of eggs/milt, transport unfertilized and fertilize at the hatchery
67 under a more controlled environment; and
- 68 · Treat eggs with disinfectant (e.g., hydrogen peroxide) during incubation to reduce
69 fungus outbreaks.

70 3. Larval/juvenile die-off due to infrastructure failure:

- 71 · Spread larvae/juveniles across multiple tanks and recirculation systems within the
- 72 hatchery such that 'not all eggs are in one basket';
- 73 · Tie alarm system into staff phone line such that infrastructure failure (e.g., water
- 74 supply) is recognized immediately;
- 75 · Assess infrastructure routinely and replace as needed; and
- 76 · Consider the development of satellite or stream-side rearing facilities as backup.

77 4. Larval/juvenile die-off due to rearing methods and/or virus outbreak:

- 78 · Surface disinfect eggs prior to entry into hatchery;
- 79 · Adhere to strict biosecurity protocols such that virus outbreak is contained at the
- 80 family and/or tank level ;
- 81 · Maintain detailed records for knowledge transfer and to better identify source of
- 82 die-offs;
- 83 · Keep several 'research tanks' such that new methods and (or) verification of current
- 84 methods can be assessed regularly;
- 85 · Include satellite or stream-side rearing facilities as backup; and
- 86 · Provide training for staff.

1 **REFERENCE: Volume: N/A; Section: N/A; Page No.: N/A**

2 **CEC Rd 2 CAC-0157**

3 **ORIGINAL PREAMBLE AND QUESTION (CAC-0024a):**

4 The results of the HHRA present risk quotient values above 1 and indicated that
5 Manitoba Health and Health Canada have committed to working with the KCN and
6 Manitoba Hydro on consumption advisories in a separate process. In addition, Section
7 7.2.1 in the Fish Quality assessment indicated that mercury concentrations can remain
8 above preimpoundment levels for 20-30 years.

9 Are Manitoba Health and/or Health Canada committed to issuing consumption
10 advisories for up to 30 years?

11 **FOLLOW-UP QUESTION:**

12 Often Aboriginal cultures believe that the benefits gained from consumption of
13 traditional foods are far greater than the possible health effects that may result from
14 eating contaminated traditional food. Has this issue been raised in consultation
15 activities? If so, what mitigation measures are proposed to manage this potential health
16 conundrum?

17 **RESPONSE:**

18 KCNs' beliefs and practices associated with consumption of traditional foods in the
19 context of mercury contamination were discussed as part of the work of the Mercury
20 and Human Health Technical Working Group. In fact, the reverse belief was articulated
21 by KCNs members in this Working Group. They indicated that past elevated mercury
22 levels in Gull Lake, Stephens Lake and areas affected by past hydroelectric development
23 in the vicinity led to a tendency for KCNs members to use these lakes less for fear of
24 contamination, even when mercury levels returned to background levels. Indeed, the
25 working group discussed the importance of balanced messaging – that is, encouraging
26 communities in the Socio-economic Local Study Area to eat **more** country foods that are
27 low in mercury (e.g., mammals, ducks and geese and low-mercury fish such as whitefish
28 from off-system areas) while at the same time communicating risks associated with
29 higher-mercury fish (e.g., pike and walleye) from Gull Lake and Stephens Lake after
30 impoundment. The KHLPP is working with Manitoba Health, Manitoba Conservation and
31 Water Stewardship and Health Canada to develop balanced messages for the post-
32 impoundment period when mercury-related effects will occur.

1 **REFERENCE: Volume: N/A; Section: N/A; Page No.: N/A**

2 **CEC Rd 2 CAC-0158**

3 **ORIGINAL PREAMBLE AND QUESTION (CAC-0020a):**

4 Table 5-2 presents the risk estimates for present conditions from consumption of fish
5 for various fish size classes. The risks are based on a fixed consumption rate for each
6 receptor group (i.e., toddler, child bearing woman and adult male) assessed in the
7 HHRA.

8 Is it reasonable to assume that the risk estimates presented in Table 5-2 are
9 representative of all individuals in the KCN community or are there portions of the
10 community where risk estimates are predicted to be lower or higher?

11 **FOLLOW-UP QUESTION:**

12 It is stated that "fish consumption advice from Manitoba Health and Health Canada
13 should address issues related to these circumstances". Please elaborate on how
14 Manitoba Health and Health Canada fish consumption advice "should address" these
15 issues, considering that HQs in Gull Lake for assumed (not maximum possible) intakes
16 are already 14.2 (i.e. tolerable intake is already exceeded by 14.2 times)?

17 **RESPONSE:**

18 It should be corrected that the HQ value of 14.2 from Gull Lake applies to women of
19 childbearing age who consume 5.3 kilograms (or 12 pounds) per month of standard size
20 northern pike or walleye (i.e., three 400 g meals per week) during the post-
21 impoundment years when the concentrations are expected to be greatest. The risk
22 estimates are based on an estimated mercury concentration of 1.0 µg/g in these fish
23 under maximum predicted post-impoundment conditions.

24 Under current conditions for Gull Lake, Table 5-2 shows a range of mean mercury
25 concentrations for different sizes and species of fish. For example, for women of
26 childbearing age eating northern pike from Gull Lake three times per week, the present
27 day mean mercury concentrations range between 0.129 µg/g with a HQ of 1.8 for fish
28 less than 400 mm (small fish) up to a concentration of 0.789 µg/g with a HQ of 11.2 for
29 northern pike greater than 800 mm (large fish). These risk estimates illustrate how
30 mercury concentrations change in the much larger fish.

31 Please see the response to CEC Rd 1 CAC-0024a for discussion on the risk
32 communication strategy process that includes federal and provincial health authorities.

1 **REFERENCE: Volume: N/A; Section: N/A; Page No.: N/A**

2 **CEC Rd 2 CAC-0159**

3 **ORIGINAL PREAMBLE AND QUESTION (CEC-0021):**

4 A quantitative residual effects assessment for the Local Study Areas was not provided
5 for some of the VECs and supporting topics. Eastern expansion of the Study Zone 5
6 Regional Study Area will not affect the EA findings for the Local Study Areas (generally
7 Study Zone 3, but Study Zone 2 for Terrestrial Habitat, Ecosystem Diversity, Soil Quantity
8 and Quality, Wetland Function, Priority Plants and Invasive Plants).

9 For example, it is stated in Section 2.6.4.1.1 of the Terrestrial Environment Supporting
10 Volume that the "Project Footprint could remove or alter up to 6,872 ha, or 0.6%, of
11 terrestrial habitat during construction, but this could increase to 6,952 ha if borrow area
12 E-1 is used", or 0.7% of terrestrial habitat in the Regional Study Area (Study Zone 5 with
13 area of 1,240,000 ha). Although not mentioned in Section 2.6.4.1.1, this loss of habitat
14 areas with or without the use of borrow area E-1 would represent approximately 53% of
15 the Local Study Area (Study Zone 2 with area of 13,043 ha).

16 No data on percentage of core areas to be lost were provided for the Local Study Area.
17 Rather, it was indicated in Section 2.4.4.1.1 that the number of core areas at least 200
18 ha in size that overlap the Local Study Area would decline from 13 to 12 and their
19 combined area would decline from 115,308 ha to 106,754 ha. This is a decline of 7.4%,
20 and would likely be significantly higher if only the areas of the core areas within the
21 Local Study Area are taken into consideration.

22 As stated in Section 6.5.3.3.1 "Construction Effects and Mitigation" of the Keeyask
23 Generation Project EIS Response to EIS Guidelines, "the total number of core areas
24 larger than 200 ha in the Regional Study Area is predicted to remain at 111 because,
25 although a few core areas are completely removed, several other core areas are
26 fragmented into smaller blocks. The total number of core areas larger than 1,000 ha
27 would be reduced by one. None of the very large core areas would be lost."

28 As stated in the Terrestrial Environment Supporting Volume (p. 2-120), "Project
29 construction would have localized core area effects, primarily resulting from reservoir
30 clearing, dyke construction and coffer dam diversion. One core area slightly larger than
31 1,000 ha and two core areas between 200 ha and 1,000 ha would be removed. In
32 addition, several larger core areas on the north and south sides of the Nelson River
33 would become smaller (Map 2-15). One of these latter core areas is on Caribou Island
34 and is the largest core area on an island in the Keeyask reach of the Nelson River. The

35 largest core area along the north side of the Nelson River would be reduced by 879 ha,
36 or 36%.”

37 The total losses of core areas may not be significant within the Regional Study Area, but
38 may be within the Local Study Area. However, no data are provided on percentage of
39 total core area to be lost within the Local Study Area.

40 A quantitative residual effects assessment of each project component, e.g., reservoir
41 clearing, dyke construction, coffer dam diversion, permanent and temporary
42 infrastructure footprints, reservoir inundation, for the Local Study Area in tabular form
43 and/or mapping, as appropriate, should be provided for each of the key topics:

- 44 • Intactness based on linear feature density (km/km²) and core area abundance
45 (number and ha);
- 46 • Terrestrial Habitat based on loss or alteration of terrestrial habitat (ha);
- 47 • Ecosystem Diversity based on loss or alteration of the 43 priority habitat types
48 (number and ha);
- 49 • Wetland Function based on loss, creation or alteration of shoreline wetlands, off-
50 system marsh and other wetland types (ha);
- 51 • Mallard based on loss of habitat and reduction of staging habitat quality (ha);
- 52 • Bald Eagle based on habitat alteration and loss of nests and perching trees (ha and
53 number);
- 54 • Olive-sided Flycatcher based on habitat loss (ha);
- 55 • Rusty Blackbird based on habitat loss (ha);
- 56 • Common Nighthawk based on habitat loss/gain (ha);
- 57 • Yellow Rail based on habitat loss (ha);
- 58 • Short-eared Owl based on habitat loss (ha);
- 59 • Beaver based on habitat loss (ha), colony removal (number) and improved trapping
60 access;
- 61 • Caribou based on loss of significant caribou habitat, and relative to cumulative
62 effects of Intactness, Terrestrial Habitat and Ecosystem Diversity;
- 63 • Moose due to habitat loss and alteration (ha) and increased hunting access; and
- 64 • American Marten based on habitat loss (ha) and Intactness.

65 **FOLLOW-UP QUESTION:**

66 “Please refer to the responses to CEC Rd 1 CEC-0021, Table 6 on Caribou, and CEC Rd 1
67 CEC-0037a for detailed information concerning Study Zones 5 and 6, based on the
68 Environment Canada protocol for boreal caribou.” It is widely recognized that the boreal
69 forest is dynamic – a landscape driven primarily by wildfires. This imparts some
70 uncertainty to forecasts of population persistence for caribou based on the relationship
71 between recruitment and proportion of the range disturbed (CEC Rd 1 CEC-0021 and
72 CEC-0037a). As noted by Environment Canada (2011), these stochastic effects can be

73 assessed with a habitat-dynamics model, but such models require more detail about the
74 fire regime than is provided by the EIS (Terrestrial Environment, Habitat & Ecosystems,
75 2.5.3.2).

76 · Please provide a table of the annual area burned in the Regional Study Area (Zone
77 6), 1979-2008.

78 **RESPONSE:**

79 Table 2D-3 of the Terrestrial Environment Supporting Volume, Appendix 2D provides the
80 requested information.

81 It is noted that there were major forest fires in the Regional Study Area this summer,
82 some of which are still burning. Table 2D-3 will be updated in the fall to include burns
83 that occurred from 2009 to 2013.

1 **REFERENCE: Volume: N/A; Section: N/A; Page No.: N/A**

2 **CEC Rd 2 CAC-0160**

3 **ORIGINAL PREAMBLE AND QUESTION (CAC-0020a):**

4 Table 5-2 presents the risk estimates for present conditions from consumption of fish
5 for various fish size classes. The risks are based on a fixed consumption rate for each
6 receptor group (i.e., toddler, child bearing woman and adult male) assessed in the
7 HHRA.

8 Is it reasonable to assume that the risk estimates presented in Table 5-2 are
9 representative of all individuals in the KCN community or are there portions of the
10 community where risk estimates are predicted to be lower or higher?

11 **FOLLOW-UP QUESTION:**

12 It is stated that "it is possible that individuals could intake greater amounts of mercury
13 than assumed in the HHRA".

- 14 • Since the goal of the HHRA is to protect all individuals, what is the maximum
15 possible intake of fish by an individual and what HQ value is predicted at this
16 maximum possible intake?

17 **RESPONSE:**

18 The HHRA was based on consumption advice provided by representatives of the KCNs.
19 Specifically, a workshop was convened and approximately 20 members of the KCNs and
20 their representatives were asked about consumption rates and frequencies. As an
21 example, the KCNs were asked if a person really enjoyed consuming a certain food
22 group, how much would they consume during the time of year that it is most readily
23 available? From this workshop, consumption rates were estimated and communicated
24 in the form of a memorandum and shared with the KCNs as consumption rates prior to
25 use in the HHRA.

26 For fish, the HHRA assumed that adults consume 3 meals per week with each meal
27 representing 400 g of fish. This results in a fish consumption rate by adults of about 5.3
28 kilograms or 12 pounds per month (nearly one-half pound per day on average). More
29 intrusive dietary surveys were not considered to be welcome at the time of completion
30 of the HHRA. Nevertheless, it should be clear that the assumed consumption rate
31 represented quite a large amount of fish.

32 As indicated in CEC Rd 2 CAC-0157, in the future, Manitoba Health and Health Canada
33 have expressed a willingness to work with the KHLP in providing safe consumption

34 recommendations that are protective to individuals representing different risk
35 categories (e.g. pregnant women or women of childbearing age) of the various types of
36 fish from Stephens and Gull Lakes. In that manner, people will be informed of how
37 much of each fish and size is recommended for consumption and, thus, people who eat
38 more or less than rates assumed in the HHRA will be able to make their own informed
39 decisions.

1 **REFERENCE: Volume: N/A; Section: N/A; Page No.: N/A**

2 **CEC Rd 2 CAC-0161**

3 **ORIGINAL PREAMBLE AND QUESTION (CAC-0032):**

4 Table 5-1 presents the risk estimates for fish consumption. The hazard quotient for
5 walleye for women of childbearing age is presented as 4.7 for the present conditions in
6 Stephens Lake (Table 5-1). However, based on the measured mercury concentration in
7 walleye of 0.29 ppm (Table w3-1), body weight of 60 kg, serving size of 400 g,
8 consumption frequency of three times per week (Table 4-1), and tolerable daily intake
9 of 0.2 ug/kg/day (Section 4.4.), the hazard quotient should be 4.1.

10 Please explain this discrepancy. Also, please confirm that the other hazard quotients are
11 correct.

12 **FOLLOW-UP QUESTION:**

13 It stated that "an early draft of the HHRA used slightly higher estimates of methyl
14 mercury concentration in fish from Stephen Lake". This resulted in a lowering of the HQ
15 of 4.7 to 4.1

16 · Explain why methyl mercury concentrations and associated HQ value were reduced
17 in the final HHRA.

18 **RESPONSE:**

19 The early draft of the HHRA was based on a preliminary assessment of mercury
20 concentrations in fish in Stephens Lake based on one year of data. In the final analysis,
21 the mercury content of walleye in the existing environment in Stephens Lake was
22 revised from 0.33 to 0.29 ppm to incorporate the three most recent years of data. As
23 noted in CEC Rd 1 CAC-0032, Table 5-1 in the HHRA was not updated to include the data
24 from the final mercury analysis, but the correct values were used in Table 5C-1-2, which
25 were used to formulate the overall conclusions.

1 **REFERENCE: Volume: N/A; Section: N/A; Page No.: N/A**

2 **CEC Rd 2 CAC-0162**

3 **ORIGINAL PREAMBLE AND QUESTION (MB Wildlands-0044):**

- 4 a. Does Manitoba Hydro know the mercury levels in plant, fish and other biota in
5 Stevens Lake before and after it became a reservoir, including through the last 30
6 years?
- 7 b. What effect on the fishery does Manitoba Hydro expect from Gull Lake becoming a
8 reservoir? Is Gull Lake fishery already affected by mercury?
- 9 c. Most of the data on this page is 20 or 30 years old. Does Manitoba Hydro have
10 more recent data regarding mercury in the Nelson River, in the RSA and LSA? In the
11 two Lakes one that is a reservoir and one that will become a reservoir?
- 12 d. d. Figure 6 – 7 shows mean mercury concentration in fish in Stephens Lake 1970 –
13 2005. Does Manitoba Hydro have data for fish harvest, fish population for the
14 same three species over the same period of time in Stephens Lake? Will Manitoba
15 Hydro make that information available?

16 **FOLLOW-UP QUESTION:**

17 It is stated that maximum methyl mercury concentrations in walleye and northern pike
18 are predicted to increase substantially over existing concentrations, to 1.0 ppm or
19 higher.

- 20 · Please identify how much higher than 1.0 ppm methyl mercury concentrations may
21 increase.
- 22 · Please revise the HHRA accordingly, as a maximum concentration of 1.0 ppm was
23 assumed.

24 **RESPONSE:**

25 The magnitude of predicted increases in mercury in the Keeyask reservoir is discussed in
26 the Aquatic Environment Supporting Volume (AE SV) Section 7.2.4.2.2 and reproduced
27 below for the convenience of the reviewer. As noted below, when considering all of the
28 factors that affect mercury concentrations in Keeyask reservoir fish, maximum
29 concentrations in northern pike and walleye can be expected to reach or slightly exceed
30 1.0 ppm. The highest value listed in the Table 7.2, based solely on use of Stephens Lake
31 as a proxy, is 1.46 for walleye. As discussed in the text, predicted values based on
32 Stephens Lake alone are likely an overestimate due to differences in hydraulic residence
33 times in the two waterbodies.

34 The human health risk assessment used the predicted maximum mean concentration of
35 1 ppm, which can incorporate levels that are both higher and lower than 1 ppm to

36 generate a mean of 1 ppm. Risk communication will be in place so that the public is
 37 aware of the risks of elevated mercury levels in fish when those mercury levels are not
 38 suitable for human consumption, especially for women of childbearing age and children.
 39 The rate of increases and duration of maximum mercury levels are variable among
 40 reservoirs and cannot be predicted precisely (see AE SV sections 7.2.4.2.1 and 7.2.4.2.3,
 41 respectively); therefore mercury concentrations in fish will be monitored during the
 42 operation phase until levels have declined to a long-term stable level. Associated advice
 43 to the public will take account of those mercury monitoring results.

44 The following text is extracted from the AE SV Section 7.2.4.2.2, p. 7-18 to 7-19. The
 45 table is found on AE SV p. 7-54.

46 **7.2.4.2.2 Predictions of Maximum Mercury Concentrations in Fish**

47 As outlined in Section 7.2.2.4, several modelling approaches were applied to estimate
 48 mean maximum mercury concentrations in lake whitefish, northern pike, and walleye in
 49 response to Keeyask-related flooding. All models predicted increases in concentrations
 50 above current concentrations for both the Keeyask reservoir and Stephens Lake (Table
 51 7-2).

52 ***Keeyask Reservoir***

53 Concentrations in lake whitefish are expected to more than double in the Keeyask
 54 reservoir, but will remain below 0.2 ppm. Larger increases are predicted for piscivorous
 55 species, with mercury concentrations increasing by 0.6–1.2 ppm over current
 56 concentrations in Gull Lake (Table 7-2). The values calculated using the Year 5
 57 percentage flooding estimates were similar for lake whitefish and only marginally higher
 58 for northern pike and walleye than those obtained using the initial fill level of the
 59 reservoir (Table 7-2). The values derived from the Stephens Lake proxy model were
 60 much higher (1.3 ppm for northern pike, 1.4 ppm for walleye) than those estimated
 61 using the Johnston *et al.* (1991) Percentage Flooding model (0.8 ppm for both species;
 62 see Appendix 7E).

63 There are several limitations to the Johnston *et al.* (1991) model(s) that must be
 64 considered when interpreting its predictions for fish mercury levels in the Keeyask
 65 reservoir and Stephens Lake:

- 66 • Few of the reservoirs used to build the model(s) had extensive in-lake flooding with
 67 no upstream effects, as is predicted to occur in the Keeyask reservoir;
- 68 • The Percentage Flooding model explained between 38% (for northern pike) and 57%
 69 (for walleye) of the variation in fish mercury burden (Johnston *et al.* 2001), resulting
 70 in considerable uncertainties when the model is applied to predict mercury
 71 concentrations;

- 72 • The measurement of fish mercury concentrations used in the Johnston *et al.* (1991)
73 model(s) generally began after peak concentrations occurred, such that maximum
74 mercury burdens used for modelling were likely lower than actual burdens. This may
75 have resulted in an underestimation of predicted concentrations in the Keeyask
76 reservoir; and
77 • The model(s) does not include the effect of flow rate

78 The last issue may be of particular relevance for the Keeyask reservoir, which is
79 expected to have a relatively short hydraulic residence time of up to 30 hours within the
80 mainstem, approximately 30 days within the newly formed back-bay, and only longer in
81 more sheltered, shallower areas farthest from the river mainstem (PE SV, Section
82 4.4.2.2). Fast flows and a short reservoir residence time have the potential to dilute
83 and/or remove newly generated methylmercury in the water column before it enters
84 the food web and is biomagnified in consumers at higher trophic levels. For a given
85 amount of flooding, fish mercury concentrations will be lower where flow through the
86 reservoir is high. Although most reservoirs used to build the Johnston *et al.* (2001)
87 models were riverine in nature, the hydraulic residence times and the ratios of
88 lacustrine to riverine areas were likely larger than is expected for the Keeyask reservoir.
89 Such differences in hydrology also apply to the Stephens Lake proxy model, and suggest
90 that based on flow rates alone, the predicted fish mercury concentrations for the
91 Keeyask reservoir tend to be an overestimate.

92 When considering all of the above factors that could not be (fully) accounted for in the
93 models used to make quantitative predictions of mercury concentrations in Keeyask
94 reservoir fish, maximum concentrations in northern pike and walleye can be expected to
95 reach or slightly exceed 1.0 ppm.

Table 7-2: Model-derived estimates of mean maximum mercury concentrations (ppm) in lake whitefish, northern pike, and walleye for the Keeyask reservoir and Stephens Lake after the construction of the Keeyask Generating Station compared to current mercury concentrations in Gull Lake (2002–2006) and Stephens Lake (2001–2005)

Model	Species		
	Lake whitefish	Northern pike	Walleye
Keeyask Reservoir			
Current (Gull Lake)	0.07	0.22	0.23
PF model ¹			
Day 1 ²	0.18	0.81	0.83
Year 5 ³	0.18	0.83	0.85
Proxy model ⁴			
Day 1	0.19	1.30	1.42
Year 5	0.19	1.33	1.46
Stephens Lake			
Current	0.09	0.26	0.29
PF model ⁵			
Day 1	0.12	0.40	0.43
Year 5	0.12	0.41	0.43

1. Percent flooded (PF) regression model modified after Johnston *et al.* (1991).
2. Day 1 uses the reservoir area at the first time the initial fill level is in effect.
3. Year 5 uses the estimated reservoir area at Year 5 post-flooding (PE SV, Section 6, Shoreline Erosion Processes; also see Appendix 7E, Model selection).
4. Stephens Lake is used as a proxy for future conditions in the Keeyask reservoir.
5. Applies the proportion of flooded area to the combined area of Stephens Lake and the Keeyask reservoir.

1 **REFERENCE: Volume: N/A; Section: N/A; Page No.: N/A**

2 **CEC Rd 2 CAC-0163**

3 **ORIGINAL PREAMBLE AND QUESTION (CAC-0062):**

4 Experimentation is considered to be at the core of Adaptive Management (AM). That is,
5 actions should be designed to test ideas about the behaviour of an ecosystem impacts
6 by human use. The literature identifies two types of purposeful experimentation:
7 passive AM, and active AM. Passive AM is should desired objectives not be met, one
8 remediation is proposed, implemented and evaluated at a time. Active AM focuses on
9 deliberately probing the system to test competing hypothesis, by implementing more
10 than one strategy concurrently.

11 Section 8.6 outlines examples of predetermined AM measures.

- 12 · To what degree will active AM be employed?
13 · Can you provide examples of potential active AM strategies

14 A. For example, are there several competing prescriptions for vegetation rehabilitation
15 that would be employed should the terrestrial habitat not respond to the EIS mitigation
16 measures?

17 B. For example, are there competing designed for lake sturgeon spawning structures
18 that might be employed should the structure not be as effective as anticipated?

19 **FOLLOW-UP QUESTION:**

20 CAC-0062 focused on the overall concept of Adaptive Management (AM), and asked
21 Manitoba Hydro to

- 22 i. explain the degree to which AM will be employed, and
23 ii. provide examples of potential active AM strategies. The response recognized that
24 “experimentation is a valuable tool... [and noted that] Manitoba Hydro investigates
25 current and emerging technology and research conducted by other on alternative
26 techniques. In addition, Manitoba Hydro invests considerable resource in funding
27 research and development programs...”

28 Please provide additional information. Specifically:

- 29 a. Please give examples <thematic areas, not specifics> where Manitoba Hydro is
30 investigating emerging technology or alternative techniques
31 b. Please provide a list of research funded by Manitoba Hydro over the last five years,
32 including both the dollar amount and thematic area.

33 **RESPONSE:**

34 Thank you for the opportunity to describe examples of the many types of research and
 35 development activities funded by Manitoba Hydro. General information can be found
 36 on the Manitoba Hydro website at:

37 [http://www.hydro.mb.ca/corporate/research & development](http://www.hydro.mb.ca/corporate/research%20&%20development)

38 As the information on the site notes, activities include:

- 39 . "investigating the application of new technologies;
- 40 . developing new methods, procedures, or products to carry out work more
 41 efficiently or safely;
- 42 . gaining specific knowledge about our environment to enhance our design and/or
 43 operating practices."

44 Manitoba Hydro also participates in industry research groups and academic institutions
 45 in order to facilitate collaboration with organizations having similar interests. Much of
 46 the environmental research is conducted with academic institutions with funding
 47 provided to undergraduate, graduate and postdoctoral students on projects of direct
 48 relevance to current issues. Funding for individual projects can range from tens of
 49 thousands to hundreds of thousands of dollars and total funding for environmental
 50 projects under the formal research and development program in the past five years is
 51 approximately \$3 Million.

52 The following is a list of examples of environmental thematic areas and research funded
 53 by Manitoba Hydro over the last five years, including examples where Manitoba Hydro
 54 is investigating emerging technology or alternative techniques:

- 55 . Lake Sturgeon:
 - 56 o Use of state-of-the-art methods to genetically delineate populations in
 57 Manitoba
 - 58 o Development of diagnostic tests to identify viruses
 - 59 o Evaluation of strategies to mitigate impacts of hydroelectric activity
 - 60 o Assessment of the effects of using hormones to improve egg collection
 - 61 o Evaluation of spawning habitat requirements and variables
 - 62 o Investigation of downstream movement past a generating station
 - 63 o Development of methods for efficient culture
 - 64 o Development of tagging techniques for larval and young of the year
- 65 . Caribou:
 - 66 o Development of methods to determine landscape genetics of boreal caribou
 67 using non-invasive genetic sampling

- 68 ○ Foraging ecology and movement of gray wolves In relation to anthropogenic
- 69 ○ corridors in northern Manitoba and the impacts upon boreal woodland
- 70 ○ caribou
- 71 · Birds:
- 72 ○ Dispersal and recovery of peregrine falcon in human altered landscapes of
- 73 ○ Manitoba
- 74 · Shorelines/Peatland:
- 75 ○ Development of peatland change detection using remote sensing in
- 76 ○ northern Manitoba
- 77 ○ Development of shoreline stabilization using bioengineering techniques on
- 78 ○ Wuskwatim Lake
- 79 · Lake/Reservoir monitoring/modelling:
- 80 ○ Development of an Enhanced Lake-Hydrology Module for WATFLOOD
- 81 ○ computer model
- 82 ○ Development of rapid bio-assessment protocols to monitor impacts of
- 83 ○ recreational development on Lakes (bio-assessment of effects to boreal lake
- 84 ○ ecosystems)
- 85 ○ Development of models to Improve the design of an ecosystem monitoring
- 86 ○ program for Manitoba reservoirs
- 87 ○ Trophic interactions and energy flow in the Lake Winnipeg ecosystem
- 88 · Mercury/greenhouse gas:
- 89 ○ Quantifying wet and dry atmospheric inputs of mercury to Manitoba Hydro
- 90 ○ reservoirs and watersheds
- 91 · Climate change:
- 92 ○ Impact of climate change in Canadian river basins and adaptation strategies
- 93 ○ for the hydropower industry
- 94 · Estuary:
- 95 ○ Multi-year oceanographic monitoring and hydrodynamic modelling
- 96 ○ Interactions between Polar Bears and Ringed Seals in Hudson Bay: Predator-
- 97 ○ Prey Relationship under Climate Change
- 98 ○ Hudson Bay ringed seal: ecology in a warming climate
- 99 ○ Analysis of beluga and killer whale vocalizations (Hudson Bay)
- 100 · Other:
- 101 ○ Development of robot-assisted generation maintenance and live-line work
- 102 ○ Design of meteorological towers using advanced composite materials
- 103 ○ Use of upper carbonate aquifer for heating and cooling - potential for
- 104 ○ sustainable development
- 105 ○ Bioenergy production in Manitoba using biomass cattail harvesting
- 106 ○ Overhead line design issues and wind/ice storm mitigation
- 107 ○ Assessment of landslide risk to buried pipeline infrastructure

108 It should be noted that different research projects are subject to different agreements
109 with the researchers including without limitation different obligations respecting
110 confidentiality and publicity. As such, Manitoba Hydro does not publish all the research
111 and development projects unconditionally to the public. As prescribed on Manitoba
112 Hydro's Research and Development website, any member of the public wanting
113 information on any area of research is welcome to inquire with the Research and
114 Development manager, whose coordinates can be found at the above-listed website.

1 **REFERENCE: Volume: N/A; Section: N/A; Page No.: N/A**

2 **CEC Rd 2 CAC-0164**

3 **ORIGINAL PREAMBLE AND QUESTION (CAC-0063b):**

4 The Joint Keeyask Development Agreement (JKDA) provides for a Monitoring Advisory
 5 Committee (MAC). The Terms of Reference for this Committee are described in
 6 Schedule 4-7 of the JKDA. In addition to providing a means of communication with KCNs
 7 (2a), the MAC will “provide input into monitoring activities and planning” (2(b) (ii)).
 8 Section 8 of the Response to EIS Guidelines notes that through the MAC, the Keeyask
 9 Cree Nations “will be actively involved in the development of scientific monitoring
 10 programs in the Partnership.” The response to information request CAC-0001 notes that
 11 “KCNs will play a role in monitoring and follow-up plans (including ATK) through
 12 mechanism established through governance structures of the JKDA”

13 Should KCN request a report be issued to the General Partner (and thus appended to
 14 the board of the General Partner) as per section 9, what, if any, is the process for
 15 resolving outstanding concerns?

16 **FOLLOW-UP QUESTION:**

17 CAC-0063b seeks clarification regarding the process for resolving concerns. The
 18 response to this question notes that “concerns forwarded by MAC to the Board will be
 19 discussed and addressed by both the KCNs and Hydro.”

20 · In the event that an outstanding concern is not addressed by the KCNs and/or Hydro
 21 in a satisfactory manner, what is the process for resolving outstanding concerns?
 22 For example, is there a process for mediation? If so, what are the provisions for
 23 mediation (including bringing forward a concern, funding mediation, binding
 24 decisions, etc). If there is no plan for mediation, what recourse is available in the
 25 event of an unsatisfactory means of resolution?

26 **RESPONSE:**

27 The Monitoring Advisory Committee (“MAC”) is to provide advice to the Board of the
 28 General Partner. Like all boards, the Board of the General Partner is expected to draw
 29 upon advice from many persons and, ultimately, those who sit on the Board, the
 30 directors, are required at law to make decisions that are in the best interests of the
 31 General Partner and, in effect, of the Partnership whose business is the sole
 32 responsibility of the General Partner. MAC is not an entity charged with a duty to
 33 challenge, or oppose, decisions that are the responsibility of those it advises.
 34 Accordingly, MAC will not be a party engaged in a dispute resolution process. If the
 35 directors fail to address concerns in a satisfactory manner, they should be replaced and

36 one expects that they will be by Manitoba Hydro and the KCN, each of which, pursuant
37 to the JKDA, have stipulated rights to nominate and appoint the directors.

38 For a review of the various dispute resolution processes that exist to handle various
39 disputes including, conceivably, issues arising out of the effectiveness of mitigation
40 measures, see the response to CEC Rd 2 CAC-0124).

1 **REFERENCE: Volume: N/A; Section: N/A; Page No.: N/A**

2 **CEC Rd 2 CAC-0165**

3 **ORIGINAL PREAMBLE AND QUESTION (CAC-0065a):**

4 The Environmental Protection Plan for the Bi-Pole III Project included: 1. An
5 Environmental Protection Information Management System (EPIMS): an electronic
6 system for compiling and managing results of environmental monitoring; and 2. A
7 community liaison (in addition to an environmental monitor) who would be on-site 1-2
8 days per week during construction. However, I could not find reference to either in the
9 Environmental Protection Program for Keeyask.

10 Does the Environmental Protection Plan for Keeyask include the use of an EPIMS?

11 **FOLLOW-UP QUESTION:**

12 Recommendation 12.1 requests that, "on completion of the Bipole II Project, [Manitoba
13 Hydro] undertake a third-part environment audit to assess the accuracy of assumptions
14 and predictions...[and furthermore the results of the audit] be made public. This is to be
15 repeated five years after the first environmental audit."

16 · Will Manitoba Hydro commit to an external audit for the Keeyask project five years
17 after construction, and make the finding publicly available? If not, please explain
18 how the current management systems provides for similar levels of impact
19 verification and public accountability. For example, will the unnamed data
20 management system described in CAC-0065a be publicly accessible?

21 **RESPONSE:**

22 The MAC provides oversight of the monitoring programs that are designed to follow-up
23 on the predictions in the EIS, thus overseeing the verification of those predictions.

24 In the event the predictions are found to be incorrect or the results provided via
25 monitoring do not clearly validate predictions, additional mitigation and/or monitoring
26 may be recommended by the MAC. It is anticipated that the continual oversight that
27 the MAC provides will negate the need for external verification five years after
28 construction, or at any interval to assess the accuracy of predictions. That being said,
29 the MAC may consider and recommend an external audit, if it deems necessary.

30 The results of monitoring programs will be made publicly available on the Partnership's
31 website (keeyask.com).

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 8; Page**
2 **No.: N/A**

3 **CEC Rd 2 CAC-0166**

4 **ORIGINAL PREAMBLE AND QUESTION (CAC-0065a):**

5 The Environmental Protection Plan for the Bi-Pole III Project included:

- 6 1. An Environmental Protection Information Management System (EPIMS): an
7 electronic system for compiling and managing results of environmental monitoring;
8 and
9 2. A community liaison (in addition to an environmental monitor) who would be on-
10 site 1-2 days per week during construction.

11 However, I could not find reference to either in the Environmental Protection Program
12 for Keeyask.

13 Does the Environmental Protection Plan for Keeyask include the use of an EPIMS?

14 **FOLLOW-UP QUESTION:**

15 Recommendation 12.2 requests that, "Manitoba Hydro develop and maintain, in
16 perpetuity, an easily accessible Project-related website to contain all of the information
17 related to monitoring and assessing environmental mitigation and management..." Will
18 Manitoba Hydro commit to a publicly available database containing similar information
19 for the Keeyask project? For example, will the unnamed data management system
20 described in CAC-0065a be publicly accessible? If not, please explain how the public will
21 access information about mitigation and monitoring.

22 **RESPONSE:**

23 The Partnership has already established and will continue to maintain a Project-related
24 website (keeyask.com). The website provides easy access to the Partnership's
25 environmental protection, monitoring and management plans. After activities are
26 undertaken to fulfill these plans, during both construction and operation of the Project,
27 reports will be prepared providing the results. These reports will be posted on the
28 website in a timely manner.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 8; Page**
2 **No.: N/A**

3 **CEC Rd 2 CAC-0167**

4 **ORIGINAL PREAMBLE AND QUESTION (CAC-0065a):**

5 The Environmental Protection Plan for the Bi-Pole III Project included:

- 6 1. An Environmental Protection Information Management System (EPIMS): an
7 electronic system for compiling and managing results of environmental monitoring;
8 and
9 2. A community liaison (in addition to an environmental monitor) who would be on-
10 site 1-2 days per week during construction.

11 However, I could not find reference to either in the Environmental Protection Program
12 for Keeyask.

13 Does the Environmental Protection Plan for Keeyask include the use of an EPIMS?

14 **FOLLOW-UP QUESTION:**

15 Recommendation 12.3 directs Manitoba Hydro to provide “the Manitoba Government
16 and annual report ... containing information in such detail that past, current and future
17 assessments can be made as to the accuracy of predictions, success of mitigation
18 actions and commitment to future actions.... These reports will be made public.” Will
19 Manitoba Hydro commit to a similar annual report? If not, please explain how this type
20 of information will be presented to the public in a timely manner. For example, will the
21 unnamed data management system described in CAC- 0065a be publicly accessible?

22 **RESPONSE:**

23 Annual reports on monitoring will be submitted to Manitoba Conservation and Water
24 Stewardship and will be available to the public on the Partnership’s website. These
25 reports will describe the results of the monitoring with linkages back to the predicted
26 effects, success of mitigation and recommendations for future actions related to the
27 monitoring.

28 Additionally, an annual monitoring overview which summarizes the monitoring activities
29 undertaken each year will also be produced and available to the public on the
30 Partnership’s website. Communication of monitoring results is described in Chapter 8,
31 Section 8.3.1.3 of the Response to the EIS Guidelines.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 8; Page**
2 **No.: N/A**

3 **CEC Rd 2 CAC-0168**

4 **ORIGINAL PREAMBLE AND QUESTION (CAC-0065b):**

- 5 1. An Environmental Protection Information Management System (EPIMS): an
6 electronic system for compiling and managing results of environmental monitoring;
7 and
- 8 2. A community liaison (in addition to an environmental monitor) who would be on-
9 site 1-2 days per week during construction.

10 However, I could not find reference to either in the Environmental Protection Program
11 for Keeyask.

12 Will there be a Manitoba Hydro Position termed "environmental monitor"? (as this is
13 not specified in section 1.4 of the Generating Station Construction Environmental
14 Protection Plan)

15 **FOLLOW-UP QUESTION:**

16 CAC-0065b seeks clarification regarding job positions associated with the EPP, including
17 the "environmental monitor" and "community liaisons" created for the Bi- Pole III
18 project. The response notes that while the positions are different, the environmental
19 monitors are to be community members. KCNs will be involved in ATK monitoring, and
20 members of the Monitoring Advisory Committee. Will community members employed
21 in these positions be permitted to share information with the community or will they be
22 required to report findings only to the proponent? In other words, are these community
23 members who are undertaking a role in monitoring, or are they employed in monitoring
24 who are community members?

25 **RESPONSE:**

26 In the response to CEC Rd 1 CAC-0065b it stated, "there is no Manitoba Hydro position
27 for the Keeyask Generation Project termed "environmental monitor" ...". There will be a
28 Site Environmental Officer(s) for the project that will be responsible for conducting
29 environmental compliance monitoring to confirm that the terms of the EnvPP and other
30 Project-related permits, authorizations, licences, approvals, regulations and guidelines
31 are followed. This person/people will be employed by Manitoba Hydro on behalf of the
32 Partnership.

33 The KCN members of MAC are expected to share all information that they acquire
34 through MAC meetings and activities with their communities. The Partnership will
35 facilitate this sharing of information through annual reports, including an annual
36 monitoring overview document, and through other initiatives which may include open
37 houses in the communities.

38 With respect to ATK monitoring, community members will undertake monitoring on
39 behalf of their community and will be employed to do so by their community. It will be
40 at each of the KCN's discretion to determine how the ATK monitoring results are
41 disseminated within its community. It is probable though the results will be included to
42 some degree in the annual reports and open houses described above.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 8; Page**
 2 **No.: N/A**

3 **CEC Rd 2 CAC-0169**

4 **ORIGINAL PREAMBLE AND QUESTION (CAC-0063a,b,c and CAC-**
 5 **0065a,b,c):**

6 **CAC-0063**

7 The Joint Keeyask Development Agreement (JKDA) provides for a Monitoring Advisory
 8 Committee (MAC). The Terms of Reference for this Committee are described in
 9 Schedule 4-7 of the JKDA. In addition to providing a means of communication with KCNs
 10 (2a), the MAC will ``provide input into monitoring activities and planning`` (2(b) (ii)).
 11 Section 8 of the Response to EIS Guidelines notes that through the MAC, the Keeyask
 12 Cree Nations ``will be actively involved in the development of scientific monitoring
 13 programs in the Partnership.`` The response to information request CAC-001 notes that
 14 ``KCNs will play a role in monitoring and follow-up plans (including ATK) through
 15 mechanism established through governance structures of the JKDA``

16 Please clarify the role of the MAC in the development and implementation of the
 17 monitoring programs. Should KCN request a report be issued to the General Partner
 18 (and thus appended to the board of the General Partner) as per section 9, what, if any,
 19 is the process for resolving outstanding concerns? Is there potential for the MAC to have
 20 a greater role in monitoring, for example having on-site visits to evaluate project
 21 impacts, or implement select independent monitoring studies?

22 **CAC-0065**

23 The Environmental Protection Plan for the Bi-Pole III Project included

- 24 1. An Environmental Protection Information Management System (EPIMS): an
 25 electronic system for compiling and managing results of environmental monitoring;
 26 and
- 27 2. A community liaison (in addition to an environmental monitor) who would be on-
 28 site 1-2 days per week during construction.

29 However, I could not find reference to either in the Environmental Protection Program
 30 for Keeyask.

31 Does the Environmental Protection Plan for Keeyask include the use of an EPIMS? Will
 32 there be a Manitoba Hydro Position termed ``environmental monitor``?(as this is not
 33 specified in section 1.4 of the Generating Station Construction Environmental Protection

34 Plan) Will there be a community liaison positions? (as this is not specified in section 1.4
35 of the Generating Station Construction Environmental Protection Plan)

36 **FOLLOW-UP QUESTION:**

37 Like the Environmental Protection Program described by Manitoba Hydro, we have
38 distilled the adaptive management cycle to four phases: plan (and hypothesize), do (and
39 monitor), evaluate (and learn), and adjust (as needed or desired). A critical component
40 of each phase is ensuring there is adequate capacity associated with the program . To
41 that end, this group of questions focuses on financial capacity.

- 42 a. What funds have been allocated to implement the four monitoring plans?
43 b. What level of funding is associated with each phase of the plan (preconstruction,
44 construction, initial operation and long-term operation)?
45 c. What is the process for increasing funding (which is important given that it is
46 anticipated that monitoring will be reduced during long-term operations? (e.g.
47 Physical Environment Monitoring Plans, p.1-5)
48 d. should there be a dispute between the Monitoring Advisory Committee (MAC) and
49 the Board over funding, how will this dispute be resolved? <In the event that an
50 outstanding concerns is not addressed to the satisfaction of the MAC, what is the
51 process for dispute resolution over funding?

52 **RESPONSE:**

53 The Partnership has taken into account the cost of fulfilling the four currently filed
54 monitoring plans and the entire Environmental Protection Program and has allocated
55 sufficient funds to implement them both during construction and operations with
56 contingency if, through the adaptive management cycle, it is determined additional
57 monitoring and/or mitigation is required. The contingency will be accessed as required
58 and the Board of the General Partner Board will be advised of the use of these funds as
59 a component of the overall Project budget.

60 It is anticipated that the Environmental Protection Program will be a licence
61 requirement and, as such, the Partnership will be legally required to implement it fully
62 including any outcomes of the adaptive management process. The Partnership is fully
63 committed to fulfill all licence requirements.

64 It is certainly anticipated there may be differences of opinion between the KCNs and
65 Manitoba Hydro with respect to monitoring activities. In the JKDA, the Terms of
66 Reference for MAC includes a process for issues to be raised with the Board and
67 resolved at that level. A report outlining concerns raised will be provided to the board
68 (Board) of the General Partner upon request as described in CEC Rd 1 CAC-0063b.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 8; Page**
 2 **No.: N/A**

3 **CEC Rd 2 CAC-0170**

4 **ORIGINAL PREAMBLE AND QUESTION (CAC-0063a,b,c):**

5 The Joint Keeyask Development Agreement (JKDA) provides for a Monitoring Advisory
 6 Committee (MAC). The Terms of Reference for this Committee are described in
 7 Schedule 4-7 of the JKDA. In addition to providing a means of communication with KCNs
 8 (2a), the MAC will “provide input into monitoring activities and planning” (2(b) (ii)).
 9 Section 8 of the Response to EIS Guidelines notes that through the MAC, the Keeyask
 10 Cree Nations “will be actively involved in the development of scientific monitoring
 11 programs in the Partnership.” The response to information request CAC-001 notes that
 12 “KCNs will play a role in monitoring and follow-up plans (including ATK) through
 13 mechanism established through governance structures of the JKDA”

14 Please clarify the role of the MAC in the development and implementation of the
 15 monitoring programs. Should KCN request a report be issued to the General Partner
 16 (and thus appended to the board of the General Partner) as per section 9, what, if any,
 17 is the process for resolving outstanding concerns? Is there potential for the MAC to
 18 have a greater role in monitoring, for example having on-site visits to evaluate project
 19 impacts, or implement select independent monitoring studies?

20 **FOLLOW-UP QUESTION:**

21 The monitoring plans are provided in draft format, as they should be given the
 22 uncertainties related to the outcome of the assessment, and temporal unknowns
 23 associated with the degrees and types of long-term monitoring required. That being
 24 said, it is important to understand the process through which the decisions will be
 25 made. The monitoring plans indicate that “any adjustments would be discussed with the
 26 MAC” (e.g. Physical Environment Monitoring Plan P. 1-6)

- 27 a. Will the MAC be financial resources to engage independent technical expertise to
 28 review recommendation of Manitoba Hydro? If so, how would the topic areas and
 29 levels of funding be negotiated? In the event that the MAC does not agree with the
 30 proposed adjustments, would dispute resolution be facilitated through the Board
 31 (as per response to CAC- 0063b)
- 32 b. Following the line of questions in CAC-IR Round 2-54, what are the provisions for
 33 resolution should the outstanding concerns not be addressed to the satisfaction of
 34 the MAC? <eg mediation?>

- 35 c. How will the regulator(s) and the public be involved in decisions to adjust
 36 monitoring plans?
 37 d. Outside the MAC, how will changes to monitoring plans be communicated with the
 38 public? Will these be communicated as needed, annually, at each distinct phase?
 39 e. What is the anticipated time period for re-evaluating monitoring plans during the
 40 first three phase of the project (pre-construction, construction, initial operation and
 41 long-term operation)? <For the long-term operation, is it 10 years, as suggested in
 42 Physical Environment Monitoring Plan p. 1-7?> In your response, please backcast
 43 the timing between review of results; reviewing feedback from the MAC, regulators
 44 and public; refining plans; presenting the revised plans to the MAC for discussion;
 45 implementation; and communicating changes.

46 **RESPONSE:**

47 The above questions are answered in turn below.

- 48 a. *Will the MAC be financial resources to engage independent technical expertise to
 49 review recommendation of Manitoba Hydro? If so, how would the topic areas and
 50 levels of funding be negotiated? In the event that the MAC does not agree with the
 51 proposed adjustments, would dispute resolution be facilitated through the Board (as
 52 per response to CAC- 0063b)*

53 It is not anticipated that independent technical expertise will be required to review
 54 recommendations presented at MAC; however, if the Partnership Board, based on a
 55 recommendation from MAC, determines it appropriate to do so, the financial resources
 56 required will be made available. As members of MAC, funding will be provided to the
 57 KCNs to engage independent technical expertise, including attendance of advisors at
 58 MAC meetings. If the MAC or members of the MAC do not agree with the proposed
 59 adjustments to monitoring, as per the MAC Terms of Reference, a report outlining
 60 concerns raised will be provided to the Board of the General Partner upon request as
 61 described in CEC Rd 1 CAC-0063b.

- 62 b. *Following the line of questions in CAC-IR Round 2-54 [CEC Rd 2 CAC-0164], what are
 63 the provisions for resolution should the outstanding concerns not be addressed to
 64 the satisfaction of the MAC? <eg mediation?>*

65 Please refer to the response to CEC Rd 2 CAC-0164, which explains that the MAC is an
 66 advisory committee to the Board of the General Partner and, accordingly, MAC will not
 67 be a party engaged in a dispute resolution process. Question a. above describes how
 68 concerns will be raised with the Board.

- 69 c. *How will the regulator(s) and the public be involved in decisions to adjust monitoring
 70 plans?*

71 Regulators will be kept apprised of all monitoring results and will be involved in
 72 discussions with respect to amendments to the plans, as appropriate. Beyond the KCNs,
 73 it is not anticipated that the public will be involved in decisions to adjust monitoring
 74 plans.

75 *d. Outside the MAC, how will changes to monitoring plans be communicated with the*
 76 *public? Will these be communicated as needed, annually, at each distinct phase?*

77 Changes to monitoring plans will be communicated with the public via the Partnership's
 78 website, as needed.

79 *e. What is the anticipated time period for re-evaluating monitoring plans during the*
 80 *first three phase of the project (pre-construction, construction, initial operation and*
 81 *long-term operation)? <For the long-term operation, is it 10 years, as suggested in*
 82 *Physical Environment Monitoring Plan p. 1-7?> In your response, please backcast the*
 83 *timing between review of results; reviewing feedback from the MAC, regulators and*
 84 *public; refining plans; presenting the revised plans to the MAC for discussion;*
 85 *implementation; and communicating changes.*

86 Monitoring plans will be evaluated on an ongoing basis as results become available.
 87 MAC will regularly be reviewing results and discussing if plans need to be revised. For
 88 the Physical Environment Monitoring Plan, a review after 10 years of operation is
 89 appropriate as the largest project effects that this plan monitors are expected to occur
 90 early in the operations phase. The other monitoring plans cover a variety of VEC's that
 91 have substantial variability in the timeline when effects can be determined. As such,
 92 there is no set formal re-evaluation of monitoring that covers all plans and parameters
 93 that are being studied.

94 The timelines between the review of results and the implementation of changes to
 95 either monitoring or mitigation will vary depending on the circumstances, the nature of
 96 the results being observed, the VEC under consideration and the extent of the required
 97 changes.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 4; Page**
 2 **No.: N/A**

3 **CEC Rd 2 CAC-0171**

4 **ORIGINAL PREAMBLE AND QUESTION (CAC-0064b):**

5 The impact statement notes, in several locations, that Manitoba Hydro's EMS system is
 6 ISO 14001 registered, and it anticipates that this project will be included in that
 7 registration (eg., Project Description 4-11; Response to EIS Guidelines 4-49; 8-1). For
 8 example, certification is cited as evidence of Hydro's "continual improvement of
 9 environmental performance." (Response to EIS Guidelines 8-1)

- 10 • Please explain how certification demonstrates continual improvement of
 11 environmental performance, with specific examples. • Please include a copy of the
 12 most recent ISO-14001 audit. If this is not possible, please summarize the outcomes
 13 of this audit, including areas where improvement was suggested.

14 **FOLLOW-UP QUESTION:**

15 The Partnership cites ISO 14001 certification as evidence of continual improvement of
 16 environmental performance. (Response to EIS Guidelines 8-1). Yet, in its response to
 17 CAC-0064, it declines to provide a copy of its most recent audit. The auditor also has
 18 advised that it is not prepared to provide a summary of the audit. An Examination of the
 19 Customer Service and Distribution Business Unit's Environmental Compliance
 20 Management Process at Manitoba Hydro (Rezai Thesis, August 2012) suggests need for
 21 improvement in i) accountability and responsibility ii) stronger monitoring systems iii)
 22 training and iv) communication.

- 23 • Can we agree that certification by itself, in the absence of information about
 24 certification, including the benchmark, areas of strength and limitations provides
 25 limited insight into environmental performance? Please explain your answer.
 26 • Please explain the selection of the older ISO 14001 standard as compared to other
 27 possible CSR systems such as Global Reporting Initiative Electrical Utilities
 28 Guidelines or the International Hydropower Association "Hydropower Sustainability
 29 Assessment Protocol."
 30 • Is there agreement with the conclusions of the Rezai Masters Thesis that there is
 31 need for improvement in i) accountability and responsibility ii) stronger monitoring
 32 systems iii) training and iv) communication. If not, please explain your answer.

33 **RESPONSE:**

34 • *Can we agree that certification by itself, in the absence of information about*
 35 *certification, including the benchmark, areas of strength and limitations provides*
 36 *limited insight into environmental performance? Please explain your answer.*

37 Organizations seeking certification under the ISO 14001 standard adopt progressive
 38 environmental policies and practices that meet or exceed regulatory requirements. In
 39 and of itself, ISO 14001 certification is not a guarantee of good environmental
 40 performance, as the standard does not establish absolute requirements for
 41 environmental performance. In general, the standard instructs “what” the components
 42 of the system are; it does not prescribe “how” the requirements of those components
 43 are to be met. The investment of time and resources needed to attain ISO 14001
 44 certification requires a significant commitment to improving environmental
 45 performance. Maintaining the registration provides Manitoba Hydro with an
 46 opportunity to demonstrate this commitment.

47 • *Please explain the selection of the older ISO 14001 standard as compared to other*
 48 *possible CSR systems such as Global Reporting Initiative Electrical Utilities Guidelines*
 49 *or the International Hydropower Association “Hydropower Sustainability Assessment*
 50 *Protocol.”*

51 Manitoba Hydro believes that the ISO 14001 standard is the best standard for managing
 52 the environmental impacts of our operations. The standard was developed through
 53 extensive consultation with stakeholders and is globally recognized. Although the
 54 current version dates back to 2004, the standard is under review by ISO and an updated
 55 version is expected to be released in 2014 or 2015.

56 Manitoba Hydro is a participant in the Canadian Electricity Association “Sustainable
 57 Electricity Program”. Participants in the program are required to be certified under the
 58 ISO 14001 standard or equivalent.

59 In addition, the Keeyask Project has been evaluated under the International
 60 Hydropower Association “Hydropower Sustainability Assessment Protocol,” and a draft
 61 report is scheduled to be posted for public review in August 2013. Keeyask is the first
 62 plant in North America to be assessed using the Sustainability Assessment Protocol. The
 63 Keeyask Project performance is very high, with all assessed aspects ranking at a good
 64 international practice to best international practice level.

65 • *Is there agreement with the conclusions of the Rezai Masters Thesis that there is*
 66 *need for improvement in i) accountability and responsibility ii) stronger monitoring*
 67 *systems iii) training and iv) communication. If not, please explain your answer.*

68 The conclusions cited in the Rezai Master's Thesis are consistent with the notion of
69 continual improvement, which is a core requirement of the ISO 14001 standard. As an
70 ISO 14001 registered organization, Manitoba Hydro seeks opportunities for continual
71 improvement wherever possible.

72 The Rezai Master's Thesis was an academic process undertaken specific to the
73 compliance process of Customer Service & Distribution, one of several business units
74 within the company. It is not reflective of Manitoba Hydro as a whole. Evaluation of
75 compliance is one of many required components of an ISO 14001 environmental
76 management system. The suggestions for improvement in accountability and
77 responsibility, stronger monitoring systems, training, and communication are theoretical
78 in nature and were received by Manitoba Hydro as information only.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 4; Page**
 2 **No.: N/A**

3 **CEC Rd 2 CAC-0172**

4 **ORIGINAL PREAMBLE AND QUESTION (CAC-0064):**

5 The impact statement notes, in several locations, that Manitoba Hydro's EMS system is
 6 ISO 14001 registered, and it anticipates that this project will be included in that
 7 registration (eg., Project Description 4-11; Response to EIS Guidelines 4-49; 8-1). For
 8 example, certification is cited as evidence of Hydro's "continual improvement of
 9 environmental performance." (Response to EIS Guidelines 8-1)

- 10 · Please explain how certification demonstrates continual improvement of
 11 environmental performance, with specific examples.
 12 · Please include a copy of the most recent ISO-14001 audit. If this is not possible,
 13 please summarize the outcomes of this audit, including areas where improvement
 14 was suggested.

15 **FOLLOW-UP QUESTION:**

16 Although the proponent has stated that the ISO-14001 audit is subject to a
 17 confidentiality agreement, if the proponent intends to rely on the ISO-14001 as evidence
 18 of continual improvement could it provide a general overview of areas where it has
 19 demonstrated continued improvement and areas where improvement was
 20 recommended?

21 **RESPONSE:**

22 In order for an organization, such as Manitoba Hydro to ensure that its performance
 23 meets and will continue to meet legal and policy requirements, 'continuous
 24 improvement' is required, especially to meet a very high International Standard such as
 25 that of the ISO 14001. International Standards that cover environmental management
 26 are intended to provide organizations with the fundamentals for an effective EMS to be
 27 incorporated with other management requirements. This assists organizations in
 28 achieving environmental and economic goals. ISO 14001 stipulates requirements for an
 29 EMS to enable an organization to develop and implement a policy and objectives that
 30 account for legal requirements and information about significant environmental
 31 aspects.

32 According to The ISO 14000 Essentials - A Practical Guide to Implementing the ISO
 33 14000 Standards the ISO 14001:2004 is based on the method of Plan-Do-Check-Act
 34 (PDCA).

35 *PDCA can be briefly described as follows:*

- 36 ○ *Plan: establish the objectives and processes necessary to deliver results in*
- 37 *accordance with the organization's environmental policy.*
- 38 ○ *Do: implement the processes.*
- 39 ○ *Check: monitor and measure processes against environmental policy,*
- 40 *objectives, targets, legal and other requirements, and report the results.*
- 41 ○ *Act: take actions to continually improve performance of the environmental*
- 42 *management system.*

43 Manitoba Hydro's EMS is registered to the ISO 14001:2004 Standard and follows the
44 principles of the PDCA, which as indicated above is intended to drive continual
45 improvement.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: Section**
 2 **8 Monitoring & Follow-up; Page No.: N/A**

3 **CEC Rd 2 CAC-0173**

4 **ORIGINAL PREAMBLE AND QUESTION (CAC-0062):**

5 Experimentation is considered to be at the core of Adaptive Management (AM). That is,
 6 actions should be designed to test ideas about the behaviour of an ecosystem impacts
 7 by human use. The literature identifies two types of purposeful experimentation:
 8 passive AM, and active AM. Passive AM is should desired objectives not be met, one
 9 remediation is proposed, implemented and evaluated at a time. Active AM focuses on
 10 deliberately probing the system to test competing hypothesis, by implementing more
 11 than one strategy concurrently. Section 8.6 outlines examples of predetermined AM
 12 measures.

- 13 · To what degree will active AM be employed? · Can you provide examples of
 14 potential active AM strategies.
- 15 a. For example, are there several competing prescriptions for vegetation
 16 rehabilitation that would be employed should the terrestrial habitat not
 17 respond to the EIS mitigation measures?
- 18 b. For example, are there competing designed for lake sturgeon spawning
 19 structures that might be employed should the structure not be as effective
 20 as anticipated?

21 **FOLLOW-UP QUESTION:**

22 The original question asked was: To what degree will active AM be employed? Can you
 23 provide examples of potential active AM strategies

- 24 a. For example, are there several competing prescriptions for vegetation rehabilitation
 25 that would be employed should the terrestrial habitat not respond to the EIS
 26 mitigation measures?
- 27 b. For example, are there competing designed for lake sturgeon spawning structures
 28 that might be employed should the structure not be as effective as anticipated? The
 29 proponent did not appear to address in detail the question (B) related to competing
 30 designs for lake sturgeon spawning structures that might be employed should the
 31 structure not be as effective as anticipated. Please address this question in detail

32 **RESPONSE:**

33 Examples of adaptive management strategies are given for (a) vegetation rehabilitation
 34 and (b) Lake Sturgeon spawning strcutures.

35 (A) Vegetation Rehabilitation

36 Regarding vegetation rehabilitation, there are alternative prescriptions for most
 37 combinations of target habitat type and post-construction site conditions. The typical
 38 strategy would be to start with the cost-effective strategy that is expected to have the
 39 highest likelihood of achieving the target for the location. If monitoring shows that
 40 targets will not be achieved, then some of the alternative strategies include additional
 41 planting, additional seedling, additional soil remediation, and enhancing drainage. The
 42 specific measure used would be determined by the perceived reason why the target is
 43 not being met, maintaining successful outcomes achieved to date, and practicable
 44 means for addressing deficiencies.

45 (B) Lake Sturgeon Spawning Structure

46 The design of the Lake Sturgeon spawning structure and potential modifications based
 47 on monitoring results are provided in the AE SV Appendix 1a Section 1A.3.2.3.1 and
 48 reproduced for the convenience of the reviewer below. Two potential modifications are
 49 discussed:

- 50 1. Expansion of the shoal to other areas if monitoring shows that sturgeon are not
 51 congregating on the shoal or if substantial numbers are going elsewhere. As
 52 discussed, hydraulic modeling has identified potential suitable areas but the actual
 53 placement of the new shoals would depend on site conditions and sturgeon
 54 distribution; and
- 55 2. Effect of cycling at the GS. If monitoring indicates that cycling is having an adverse
 56 effect on sturgeon use of the shoal or survival of larval fish, then the operating
 57 regime during spring would be modified.

58 **1A.3.2.3.1 Creation of Artificial Spawning Habitat Downstream of the**
 59 **Powerhouse**

60 *"The creation of artificial spawning habitat downstream of the powerhouse would*
 61 *ensure that lake sturgeon spawning habitat is available following development of the*
 62 *Project. Currently, the creation of spawning habitat in proximity to where it exists today*
 63 *appears to have the greatest probability of success. This spawning habitat would be*
 64 *designed specifically to attract lake sturgeon, but it could also be used by other species*
 65 *that spawn under similar conditions.*

66 *In addition, the spawning structures would provide habitat suitable for colonization by*
 67 *benthic invertebrates that inhabit high velocity rocky habitats, and will thereby partially*
 68 *compensate for the loss of foraging habitat in Gull Rapids.*

69 *Design Criteria*

70 *Criteria for the construction of lake sturgeon spawning habitat (Table 1A-9) are based on*
71 *successful spawning structures that have been constructed for lake sturgeon in Québec*
72 *and Russia (Verdon and Gendron 1991; DuMont et al. 2009 in LeHaye et al. 1992; Kerr et*
73 *al. 2011). HSI modelling indicates that existing suitable spawning habitat within and*
74 *below Gull Rapids tends to be found along the edges of the main channel (Section*
75 *6.3.2.3). The spawning structure is proposed to be built on the north shore of the river*
76 *below the powerhouse tailrace in order to ensure adequate and reliable flow and to be*
77 *situated where lake sturgeon moving upstream in low velocity habitat along the river's*
78 *edge would locate it.*

79 *Final Design Plans/Considerations*

80 *Design and evaluation of the spawning structure required detailed hydraulic modelling,*
81 *and was conducted using a stepwise process.*

82 *The initial concept that was evaluated involved the creation of 3 ha of sturgeon*
83 *spawning habitat along the north shore, north and east of the powerhouse tailrace for*
84 *base loaded operation of four to seven units. Spawning habitat location, details and*
85 *configuration of the boulder cluster microhabitats are shown in Figure 1A-1 and Map 1A-*
86 *7. Key features to this spawning habitat are a minimum substrate thickness of 0.6 m*
87 *(with 0.1 m to 0.6 m diameter rock) and water depths of 1 m to 10 m. Under this*
88 *initiative, micro spawning sites will be created by placing three (1 m to 2 m) boulders in*
89 *V-shape (upstream chevron) clusters as shown in Figure 1A-1.*

90 *Depending on Stephens Lake elevation and the Keeyask GS unit discharges, results of*
91 *hydraulic modelling indicate that the area of spawning habitat, as defined by the*
92 *criteria, ranged from 1.4 to 3.0 ha for discharges of 2,200 m³/s (four units) to 4,000 m³/s*
93 *for (seven units). These areas overlap with each other (i.e., the 1.4 ha area is contained*
94 *within the 3.0 ha area), suggesting that under operational conditions of four to seven*
95 *units there will be a constant 1.4 ha that meet the prescribed suitability criteria. The*
96 *amount and location of spawning habitat area that meets the aquatic habitat criteria*
97 *are also dependent on the elevation of Stephens Lake. Sturgeon eggs that are distributed*
98 *over areas that are inconsistently exposed to optimal velocities may experience lower*
99 *incubation success owing to reduced water circulation in the interstices of the spawning*
100 *substrate, and hence reduced oxygenation. The changes in water depth that accompany*
101 *these sub-optimal velocities would be unlikely to affect incubation success.*

102 *The second concept expanded the evaluation to consider peaking operation of two units*
103 *to seven units, and a phased approach to the placement of spawning habitat (Map 1A-*
104 *8A and Map 1A-8). The design identified during the first concept was modified to include*
105 *refinements to the north wall of the powerhouse tailrace channel to incorporate a slope*
106 *in the channel and a bench along the north end of the tailrace channel near the*

107 powerhouse parking lot as shown in Figure 1A-2. These design modifications were
108 included as studies at the Pointe du Bois GS have found that, under some flow
109 conditions, sturgeon move into the tailrace channel and that quiet waters next to
110 turbulent fast flow create preferred microhabitats. The changes to the vertical wall of
111 the tailrace channel are meant to guide sturgeon that move upstream past the
112 constructed spawning structure to an area of suitable substrate for spawning. In
113 addition, the potential to create more suitable substrate for spawning by leaving
114 remnants of the cofferdam, or side-casting, was evaluated (Map 1A-8A). Due to the
115 hydraulic effects of the cofferdam remnants, leaving a substantial amount of material is
116 not feasible. However, where practical, coarse materials from the remnants of the
117 tailrace summer level cofferdam may be spread to create conditions attractive to
118 spawning fish in areas where interference with the outflow from the GS will not be a
119 concern.

120 At the project in-service date, spawning habitat available to sturgeon downstream of the
121 GS will consist of the modified north bank of the tailrace channel, the first phase of the
122 constructed spawning habitat (up to 5.3 ha), and areas where coarse material remains
123 from cofferdam removal/side-casting (see Map 1A-8A). Use of these areas by spawning
124 sturgeon will be monitored and, if a requirement for other spawning habitat is identified
125 (e.g., if conditions in the initially created habitat are not suitable), then additional
126 habitat will be constructed in a phased approach. Potential areas downstream of the GS
127 adjacent to the initially created habitat have been identified based on hydraulic
128 modelling (creating up to 15.9 ha of spawning habitat); however, actual locations would
129 be adjusted depending on site-specific conditions and responses of sturgeon to the flows
130 downstream of the GS.

131 The area of spawning habitat that meets the design criteria is dependent on the
132 discharge through the powerhouse and the water elevation of Stephens Lake. For
133 example, the first phase provides 0.4–4.7 ha for discharges of 1,100 m³/s (two units, 1
134 and 2) to 4,000 m³/s (seven units) respectively, while the third phase provides
135 approximately 3.0–7.9 ha for these same discharges.

136 During the spawning period, the operation of the Keeyask GS will be modified such that
137 flow from the two northernmost units is continuous to maintain appropriate hydraulic
138 conditions over the spawning structure. In addition, monitoring will be required to
139 determine if the cycling mode of operation adversely affects the behaviour of spawning
140 fish. As long as drawdowns on Stephens Lake do not cause spawning habitat velocity and
141 depth criteria to be violated, it is unlikely that the operation of the Kettle GS would have
142 to be modified."

1 **REFERENCE: Volume: N/A; Section: N/A; Page No.: N/A**

2 **CEC Rd 2 KK-0014**

3 **ORIGINAL PREAMBLE AND QUESTION (KK-0006):**

4 Please describe the manner and degree to which the Proponent treats and has treated
5 the Inninesewin of Kaweechiwasihk Kay-tay-a-ti-suk with equal importance and value,
6 with a particular discussion, as examples, of the consideration in the Environmental
7 Impact Statement of:

- 8 a. Lake Sturgeon;
- 9 b. Pickerel;
- 10 c. Whitefish;
- 11 d. Northern Pike;
- 12 e. Woodland caribou;
- 13 f. Moose;
- 14 g. Fur-bearing animals; and
- 15 h. Other fish and wildlife.

16 **FOLLOW-UP QUESTION:**

- 17 a. Please describe the principal differences between the observations and perspectives
18 of ATK and technical science on matters considered by the Proponent.
- 19 b. Using one or more examples of such differences between the observations and
20 perspectives of ATK and technical science on a matter, please describe how the
21 Proponent proposes that these differences be addressed in monitoring plans.

22 **RESPONSE:**

23 Please see the response to CEC Rd 1 CAC-0057:

24 "The Keeyask Project was subject to two environmental evaluations. While each
25 process was used for a different purpose, both focused on the potential future
26 environment with the Project based on an understanding of historical conditions
27 and responses of the environment to previous developments. The first
28 environmental evaluation was conducted by each of the Keeyask Cree Nations
29 (KCNs) to evaluate the effects of the Project on themselves from their own
30 distinctive worldview; the second was prepared to comply with the federal and
31 provincial environmental regulatory process:

- 32 • *KCNs' Evaluation Process:* The KCNs evaluation process took place over the
33 course of a decade with the support of Manitoba Hydro. The process assisted
34 the KCNs to understand the Project and its impacts on their communities and

35 Members, and to determine the conditions under which they would approve
 36 the Joint Keeyask Development Agreement and support the Project. The Project
 37 was evaluated by each of the KCNs in terms of their own worldview, values and
 38 experience with past hydroelectric development, as well as their relationships
 39 with Mother Earth (see Chapter 2 and the KCNs' Environmental Evaluation
 40 Reports which were provided to assist other people to understand their
 41 independent decisions to be Project proponents).

- 42 • *Government Regulatory Assessment Process: Work by Manitoba Hydro and the*
 43 *KCNs on the government regulatory assessment process also took place over*
 44 *many years. The Keeyask environmental impact assessment is in accordance*
 45 *with the regulatory framework outlined in guidance provided by federal and*
 46 *provincial regulatory agencies, and standard environmental assessment*
 47 *practice. The effects assessment, as well as identified mitigation and long-term*
 48 *monitoring were developed based on scientific methods (referred to as*
 49 *“technical information” in the EIS), Aboriginal traditional knowledge (ATK) and*
 50 *local knowledge (see Chapter 5 of the Response to EIS Guidelines for a full*
 51 *description of the methodology employed in the government regulatory*
 52 *assessment process).*

53 The differences in these two worldviews are noted in the EIS.

54 Given the differing worldviews, there are naturally some cases where the conclusions
 55 reached to date by these two evaluation processes are different. For example,
 56 Tataskweyak Cree Nation and York Factory First Nation believe that open water levels
 57 on Split Lake will be affected as a result of the Project; in contrast, engineering studies
 58 and analysis indicate that open water levels on Split Lake will not be affected – in fact,
 59 the requirement that these open water levels will not be affected by the Project is a
 60 fundamental feature of the Project in the Joint Keeyask Development Agreement.

61 In such cases, the Partnership has developed monitoring programs that respond to the
 62 concerns raised through both worldviews (e.g., water levels will be monitored on Split
 63 Lake) and dialogue will occur with TCN Members. This monitoring will be conducted to
 64 determine what, if any, changes occur to a VEC or other indicator due to Project
 65 development and/or other factors, and to assess the accuracy of predictions in the
 66 Project EIS and the efficacy of mitigation measures. As such, monitoring will measure
 67 changes against current conditions and the expected trends in such conditions without
 68 the Project. This monitoring will be undertaken through both technical monitoring
 69 programs, as well as ATK monitoring programs undertaken by each of the KCNs.

70 Chapter 8 of the Response to EIS Guidelines outlines monitoring and follow-up activities
 71 planned for the Project, including how the KCNs Partners will collaborate in this regard
 72 through the Monitoring Advisory Committee (MAC), the Partnership Board of Directors,

- 73 participation in technical monitoring programs and implementation of their own ATK
- 74 monitoring programs.”

1 **REFERENCE: Volume: N/A; Section: N/A; Page No.: N/A**

2 **CEC Rd 2 KK-0015**

3 **ORIGINAL PREAMBLE AND QUESTION (KK-0007b and KK-0009):**

4 **KK-0007b**

5 Where the Proponent asserts in the EIS that Aboriginal Traditional Knowledge (ATK) will
6 play a role in future monitoring activities, to examine:

- 7 a. how ATK was identified, documented, contributed or solicited;
- 8 b. how ATK was considered;
- 9 c. which elements of the project monitoring will or are expected to take ATK into
10 account;
- 11 d. in the context of project monitoring, how ATK is expected to assist in addressing any
12 gaps in baseline information or the prediction of impacts; and
- 13 e. in the context of regulatory requirements, including licence terms and conditions,
14 how ATK is expected to assist in addressing gaps in baseline information or the
15 prediction of impacts.

16 **KK-0009**

17 Where the EIS refers to effects of the Project on Lake Sturgeon or other fish species,
18 including in the context of the monitoring of the effects of the Project on the
19 populations of Lake Sturgeon and other fish species, please describe and provide:

- 20 a. where ATK is a source of the information relied upon regarding the conclusions in
21 respect of the effect on Lake Sturgeon and other fish species, the explanations
22 requested in KK-IR-007A (a) through (d), inclusive; and
- 23 b. where the EIS suggests and appears to rely upon the role of ATK in the monitoring of
24 the effects on Lake Sturgeon and other fish populations, the explanations requested
25 in KK-IR-007B (a) through (e), inclusive.

26 **FOLLOW-UP QUESTION:**

27 Please confirm whether the Proponent presently anticipates that both the technical
28 monitoring programs and the community-based ATK programs will be incorporated by
29 regulators into the terms and conditions of the project licences, and/or into the
30 protection plans, monitoring plans and the management plans associated with the
31 project licences, particularly in order to "address uncertainty in the assessment
32 identified where ATK and technical assessments reached different conclusions".

33 **RESPONSE:**

34 The Partnership has already committed to undertake both technical science and ATK
35 monitoring programs (see Chapter 8 of the Response to EIS Guidelines and the
36 introductory preface to the Environmental Protection Program). It seems reasonable to
37 assume that regulators will expect the Partnership to honour the commitments made in
38 its EIS submission and that these would become part of the terms and conditions of the
39 Project licence (unless there are particular exceptions).

40 Both the technical science and the community-based ATK programs are being designed
41 to address these areas of uncertainty, among other things (see also the response to CEC
42 Rd 1 CAC-0057).

1 **REFERENCE: Volume: N/A; Section: N/A; Page No.: N/A**

2 **CEC Rd 2 KK-0016**

3 **ORIGINAL PREAMBLE AND QUESTION (KK-0012):**

4 Where the Proponent refers to Woodland Caribou which calve in the general area of the
5 Project and in the general vicinity of Gillam, please describe and provide:

- 6 a. the analysis applied to arrive at any conclusion in respect of "Gillam area" woodland
7 caribou being "coastal caribou" and not a distinct herd of woodland caribou that is
8 apart from the Pen Island herd of woodland caribou; and
9 b. in the event that ATK is a source of the information relied regarding the conclusions
10 of the Proponent described at a), above, the explanations requested in KK-IR-007A
11 (a) through (d), inclusive.

12 **FOLLOW-UP QUESTION:**

13 Please confirm: a) the present understanding of the Proponent of the winter range of
14 summer resident caribou; b) whether the winter location of "(p)ossible sedentary or
15 short distance caribou" as described at KHP response to CEC Rd 1 KK-0012, page 4 of 6,
16 lines 110-113, generally corresponds with the present understanding of the Proponent
17 of the winter range of summer resident caribou.

18 **RESPONSE:**

19 *Please confirm the present understanding of the Proponent of the winter range of*
20 *summer resident caribou.*

21 During the winter, the summer residents most likely interact with migrating coastal
22 caribou, which could make it difficult to differentiate among the mixed populations (TE
23 SV Section 7.3.6.3.3). Radio-collared individuals from the Pen Islands coastal caribou
24 herd that remained in the Keeyask area in summer generally wintered east and north of
25 the Keeyask region, in the Shamattawa (Manitoba), Ontario, or Hudson Bay area
26 (Manitoba Hydro 2012), providing some indication of the winter range of summer
27 resident caribou. As indicated in the response to CEC Rd 1b KK-0012, possible sedentary
28 or short-distance migrant caribou were found in winter south of the Nelson River
29 between Atkinson Lake and Clark Lake, most of which were observed between Atkinson
30 Lake and Cyril Lake. As there is generally little caribou activity in Study Zone 4 in winter
31 when the migrating herds are absent, the winter ranges of summer residents do not
32 appear to be centred on the Local Study Area.

33 *Please confirm whether the winter location of "(p)ossible sedentary or short distance*
34 *caribou" as described at KHP response to CEC Rd 1 KK-0012, page 4 of 6, lines 110-113,*

35 *generally corresponds with the present understanding of the Proponent of the winter*
36 *range of summer resident caribou.*

37 This contributes to the present understanding of the winter range of summer resident
38 caribou, but does not define the entire extent of the winter range.

39 **REFERENCES:**

40 Manitoba Hydro. 2012. Bipole III Transmission Project Supplemental Caribou Technical
41 Report. Prepared for Manitoba Hydro by Joro Consultants Inc. Winnipeg, MB.
42 108 pp.

1 **REFERENCE: Volume: N/A; Section: N/A; Page No.: N/A**

2 **CEC Rd 2 KK-0017**

3 **ORIGINAL PREAMBLE AND QUESTION (KK-0009):**

4 Where the EIS refers to effects of the Project on Lake Sturgeon or other fish species,
5 including in the context of the monitoring of the effects of the Project on the
6 populations of Lake Sturgeon and other fish species, please describe and provide:

- 7 a. where ATK is a source of the information relied upon regarding the conclusions in
8 respect of the effect on Lake Sturgeon and other fish species, the explanations
9 requested in KK-IR-007A (a) through (d), inclusive; and
10 b. where the EIS suggests and appears to rely upon the role of ATK in the monitoring of
11 the effects on Lake Sturgeon and other fish populations, the explanations requested
12 in KK-IR-007B (a) through (e), inclusive.

13 **FOLLOW-UP QUESTION:**

14 Please confirm whether at any time during the bilateral and multilateral planning
15 processes involving the KCNs and Manitoba Hydro it was raised, suggested, discussed or
16 considered, whether conceptual or otherwise, that the provision of fish passage at the
17 Kelsey Generating Station to restore the passage of Sturgeon between the Upper Nelson
18 River and Lower Nelson River might form a part of the potential options and measures
19 to mitigate the direct and cumulative effects on Sturgeon resulting from the Project, and
20 if so, please: a) summarize in general terms any such suggestion, discussion or
21 consideration; and b) describe and provide any conclusions of the Proponent in respect
22 of any such suggestion, discussion or consideration of such options and measures.

23 **RESPONSE:**

24 To the best recollection of the Partnership, including the aquatic environment technical
25 team, provision of passage to Lake Sturgeon specifically at the Kelsey GS was not raised
26 as a compensation measure at Aquatic Working Group meetings, fish passage
27 workshops held in Thompson or other venues in which the environmental assessment
28 team participated.

29 However, the Partnership and Manitoba Hydro do acknowledge that concerns about the
30 effects of turbines during downstream fish passage at Kelsey GS have been raised by
31 York Factory First Nation through Project-related discussions and through other
32 discussions not linked to Keeyask Partnership activities.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
 2 **Volume; Section: 1.4.6 Sources of Information; 7.5.1 Mammal Sign**
 3 **Surveys; Page No.: 1-27, 7A-7, 7-7, Map 7-2**

4 **CEC Rd 2 MMF-0040a**

5 **ORIGINAL PREAMBLE AND QUESTION (MMF-0001a):**

6 EIS Scoping Document Reference: 4.1.3.6 Mammals: "The EIS will describe the following
 7 attributes in the applicable study area(s): ..Species composition, distribution and relative
 8 abundance of small mammals, furbearers, large carnivores and ungulates, in relation to
 9 habitat including seasonal changes."

10 The Scoping Document (Section 4.1.3.6) sets out that the EIS will describe the
 11 composition, distribution, and relative abundance of ungulates. Appendix 7A makes
 12 reference to "statistical comparisons" with collected data (TE-SV-7.0, Appendix 7A, p.
 13 7A-7); however, no analyses or statistical comparisons are presented in TE-SV-7.0 or
 14 Appendix 7A. It appears the study design for the Project included both "proxy" and
 15 "benchmark" areas (TE-SV-1.0, Section 1.4.6, p. 1-27) which can be useful for
 16 comparison to areas that have experienced similar project impacts and relatively
 17 pristine areas that will presumably remain pristine. However, the mammals report (TE-
 18 SV-7.0) does not appear to contain any results of comparisons utilizing data from the
 19 proxy and benchmark areas. With sufficient sample size, analyses should demonstrate
 20 the effectiveness (or ineffectiveness) of mitigation measures applied to previous
 21 hydroelectric projects. Analyses should also demonstrate that benchmarks function
 22 effectively as control sites (i.e., not impacted by hydroelectric activity and similar in
 23 nature to Project study area at baseline).

24 Describe what statistical analyses or comparisons were completed for ungulates for the
 25 Project and provide the results.

26 **FOLLOW-UP QUESTION:**

27 The Partnership provides reference to descriptive statistics (e.g. mean, median,
 28 frequency, standard error) in Appendix 7B that were used to summarize the data, but
 29 these have not been formally compared using mathematical statistical analysis.
 30 Therefore, we assume from the Partnership's response that all comparisons of
 31 summarized data for the Keeyask impact assessment are qualitative in nature. The
 32 Partnership also references a document that is not yet available for review: Habitat
 33 Relationships and Wildlife Habitat Quality Models for the Keeyask Region. Will the
 34 Partnership commit to provide this report for review by the MMF once available
 35 (expected late summer 2013)?

36 **RESPONSE:**

37 Statistical hypothesis testing were not reported for the comparisons referred to in the
38 question. The report entitled Habitat Relationships and Wildlife Habitat Quality Models
39 for the Keeyask Region includes statistical comparisons for key results. This report is
40 currently being revised to include additional information provided in supplemental
41 filings (e.g., updated caribou sections provided in Supplemental Filing #3) and responses
42 to information requests. It will be made available to regulators and hearing participants
43 on the Partnership's website as soon as it is finalized.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
 2 **Volume; Section: 1.4.6 Sources of Information; 7.5.1 Mammal Sign**
 3 **Surveys; Page No.: 1-27**

4 **CEC Rd 2 MMF-0040b**

5 **ORIGINAL PREAMBLE AND QUESTION (MMF-0001b):**

6 EIS Scoping Document Reference: 4.1.3.6 Mammals: "The EIS will describe the following
 7 attributes in the applicable study area(s): ..Species composition, distribution and relative
 8 abundance of small mammals, furbearers, large carnivores and ungulates, in relation to
 9 habitat including seasonal changes."

10 The Scoping Document (Section 4.1.3.6) sets out that the EIS will describe the
 11 composition, distribution, and relative abundance of ungulates. Appendix 7A makes
 12 reference to "statistical comparisons" with collected data (TE-SV-7.0, Appendix 7A, p.
 13 7A-7); however, no analyses or statistical comparisons are presented in TE-SV-7.0 or
 14 Appendix 7A. It appears the study design for the Project included both "proxy" and
 15 "benchmark" areas (TE-SV-1.0, Section 1.4.6, p. 1-27) which can be useful for
 16 comparison to areas that have experienced similar project impacts and relatively
 17 pristine areas that will presumably remain pristine. However, the mammals report (TE-
 18 SV-7.0) does not appear to contain any results of comparisons utilizing data from the
 19 proxy and benchmark areas. With sufficient sample size, analyses should demonstrate
 20 the effectiveness (or ineffectiveness) of mitigation measures applied to previous
 21 hydroelectric projects. Analyses should also demonstrate that benchmarks function
 22 effectively as control sites (i.e., not impacted by hydroelectric activity and similar in
 23 nature to Project study area at baseline).

24 Indicate if analyses performed provide support for proposed Project mitigation
 25 measures for ungulates.

26 **FOLLOW-UP QUESTION:**

27 The support presented for proposed mitigation measures is not statistically rigorous.
 28 Based on the Partnership's response to CEC Rd 1 MMF-0001a, we assume that all
 29 comparisons of summarized data for the Keeyask impact assessment are qualitative in
 30 nature. Some of the support appears to be reliant on information not yet available for
 31 review (Habitat Relationships and Wildlife Habitat Quality Models for the Keeyask
 32 Region) and, as such, cannot be verified. The Partnership indicates that mitigation
 33 includes the implementation of the CNP Moose Harvest Sustainability Plan (MHSP). As
 34 this plan has only just been made available for review, we have some information
 35 requests specific to the plan: While First Nations residents provided information on

36 moose taken for domestic harvest, no mention is made regarding Metis harvest.
 37 Without Metis data, moose harvest numbers for the model in the MHSP may be
 38 underestimated which could result in an overestimate of available moose for harvest
 39 (and subsequently could result in a permitted overharvest in future years).

- 40 · Was information on Metis moose harvest gathered for use in the MHSP? We
 41 appreciate that the MHSP acknowledges that more information would contribute to
 42 “a more detailed and accurate picture of the overall system” (MHSP, Appendix C, p.
 43 41).
- 44 · What is the confidence that the model in the MHSP will be successful in mitigating
 45 the impacts of the Keeyask project, particularly given that it appears that Metis
 46 information has not yet been incorporated? The plan states that “With respect to
 47 the allowable harvest by all hunters, the projected total sustainable harvest is
 48 probably a good management guideline, but it can only be implemented if there is a
 49 formal recording of all moose taken by all hunters, licensed and First Nations.”
 50 (Appendix C, p. 41)

51 With the possibility that reporting of moose kills does not achieve the expected goals,
 52 what is the level of confidence that the projected total sustainable harvest numbers will
 53 function as a good management guideline and, subsequently, that the Plan will be
 54 effective mitigation for Keeyask Project effects on moose?

55 **RESPONSE:**

56 *Was information on Metis moose harvest gathered for use in the MHSP? We appreciate*
 57 *that the MHSP acknowledges that more information would contribute to “a more*
 58 *detailed and accurate picture of the overall system” (MHSP, Appendix C, p. 41).*

59 Specific data on the magnitude of Metis harvest of moose in the Split Lake RMA have
 60 not been gathered to date. It is anticipated that this type of information will be made
 61 available through the Metis-specific Traditional Land Use and Knowledge Study being
 62 undertaken by the MMF. Once information from this study is available, incorporation of
 63 these data into the MHSP will be done as warranted.

64 Until information from this study is available, the following points provide useful insight
 65 into the topic.

66 There are two ways in which Metis hunters could have hunted moose in the recent past:

- 67 · By purchasing a resident hunting license or by hunting without a provincial license.
 68 Any hunters who purchased a provincial license would have had their harvest
 69 included in the model within the Licensed Hunting mortality factor. These values
 70 are averages of annual moose harvest data from Manitoba Conservation and Water
 71 Stewardship (MCWS), collected from 1993 to 2007.

72 • Hunting conducted without a provincial license may have been adequately
 73 accounted for in the model by the Black Box mortality factor, which is incorporated
 74 specifically to account for factors that cannot be measured easily. These difficult-to-
 75 measure factors include accidents, disease, poaching, or, in this case, harvest by
 76 Metis hunters. In the MHSP, the Black Box mortality rate is set at 3% for the more
 77 remote moose management units and 6% for the management unit along the
 78 Nelson River corridor, where there is considerable access. If the harvest by Metis
 79 hunters who hunt without a provincial license is relatively small (i.e., in the range of
 80 20-25 moose annually), these two mortality rates probably account for the Metis
 81 harvest, and the existing estimate of overall mortality to hunting would be good.
 82 More specific data from Metis hunters would improve these assumptions.

83 *What is the confidence that the model in the MHSP will be successful in mitigating the*
 84 *impacts of the Keeyask project, particularly given that it appears that Metis information*
 85 *has not yet been incorporated? The plan states that "With respect to the allowable*
 86 *harvest by all hunters, the projected total sustainable harvest is probably a good*
 87 *management guideline, but it can only be implemented if there is a formal recording of*
 88 *all moose taken by all hunters, licensed and First Nations." (Appendix C, p. 41).*

89 The premise of the question (i.e., that the Metis harvest has not been accounted for) is
 90 not entirely accurate (see Answer to Question 1, above), but the question is worth
 91 considering in order to clarify the purpose of the model. The answer is that our
 92 confidence in the model is high, not because individual inputs are necessarily precise
 93 but because a mechanism to manage and monitor project effects will be established.

94 In the early literature outlining the concept of adaptive management of renewable
 95 resources, proponents emphasized the importance of models:

96 "representation(s) of existing understanding of managed systems in terms of explicit
 97 models of dynamic behavior, that spell out assumptions and predictions clearly enough
 98 so that errors can be detected and used as a basis for further learning." (Walters 1986
 99 p. 9).

100 The models in the MHSP were built specifically to be explicit, clear and understandable
 101 to all stakeholders. They are simple for a reason. They were intended to be discussed,
 102 evaluated in the light of new data, and gradually improved. They have incorporated the
 103 known data about the Split Lake RMA moose population, and presented the
 104 consequences of that knowledge as the annual cycle of the herd, including allowable
 105 harvests. This provides a foundation for future learning, and *that* is the reason (not the
 106 exact correctness of a few inputs) that we have confidence in the adequacy of the plan
 107 to guide future sustainable harvest practices.

108 Reference: Walters, C. 1986. Adaptive Management of Renewable Resources.
109 Macmillan, New York.

110 *With the possibility that reporting of moose kills does not achieve the expected goals,*
111 *what is the level of confidence that the projected total sustainable harvest numbers will*
112 *function as a good management guideline and, subsequently, that the Plan will be*
113 *effective mitigation for Keeyask Project effects on moose?*

114 To clarify, CNP has been diligent in supplying harvest data to date. However, the issue is
115 really a more general one, because if any important mortality sources are poorly
116 measured in the future, or not measured at all, understanding of the system will not
117 improve, and management actions (i.e., the responsibility of Manitoba Conservation
118 and Water Stewardship) might not be appropriate. The allowable sustainable harvests
119 in the plan are currently best estimates. They are not presented as exactly the right
120 numbers that should be accepted and then applied uncritically forever, but will change
121 as experience and new information from future monitoring efforts (e.g., Preliminary
122 Terrestrial Effects Monitoring Program) informs the process.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
 2 **Volume; Section: 1.4.6; Page No.: 1-27**

3 **CEC Rd 2 MMF-0040c**

4 **ORIGINAL PREAMBLE AND QUESTION (MMF-0001c):**

5 EIS Scoping Document Reference: 4.1.3.6 Mammals: "The EIS will describe the following
 6 attributes in the applicable study area(s): ..Species composition, distribution and relative
 7 abundance of small mammals, furbearers, large carnivores and ungulates, in relation to
 8 habitat including seasonal changes."

9 The Scoping Document (Section 4.1.3.6) sets out that the EIS will describe the
 10 composition, distribution, and relative abundance of ungulates. Appendix 7A makes
 11 reference to "statistical comparisons" with collected data (TE-SV-7.0, Appendix 7A, p.
 12 7A-7); however, no analyses or statistical comparisons are presented in TE-SV-7.0 or
 13 Appendix 7A. It appears the study design for the Project included both "proxy" and
 14 "benchmark" areas (TE-SV-1.0, Section 1.4.6, p. 1-27) which can be useful for
 15 comparison to areas that have experienced similar project impacts and relatively
 16 pristine areas that will presumably remain pristine. However, the mammals report (TE-
 17 SV-7.0) does not appear to contain any results of comparisons utilizing data from the
 18 proxy and benchmark areas. With sufficient sample size, analyses should demonstrate
 19 the effectiveness (or ineffectiveness) of mitigation measures applied to previous
 20 hydroelectric projects. Analyses should also demonstrate that benchmarks function
 21 effectively as control sites (i.e., not impacted by hydroelectric activity and similar in
 22 nature to Project study area at baseline).

23 Provide power analyses demonstrating that sufficient sample sizes for tracking data were
 24 collected at baseline such that meaningful comparisons with future monitoring data can
 25 be made.

26 **FOLLOW-UP QUESTION:**

27 In its response, the Partnership refers to a document that is not yet available for review
 28 (Habitat Relationships and Wildlife Habitat Quality Models for the Keeyask Region).
 29 Therefore, it is still not clear if and how "proxy" and "benchmark" areas were used in
 30 any data comparisons.

- 31 · Please see follow-up question from CEC Rd 1 MMF-0001a [see CEC-Rd 2 MMF-
 32 0040a].
 33 · Will a power analysis be completed to determine whether sufficient baseline data
 34 have been collected to detect any differences in future analyses (in future
 35 monitoring programs)?

36 **RESPONSE:**

37 *Please see follow-up question from CEC Rd 1 MMF-0001a [see CEC-Rd 2 MMF-0040a].*

38 As indicated in CEC Rd 2 MMF-0040a, this report is currently being revised to include
39 additional information provided in supplemental filings and responses to information
40 requests, and will be made available to regulators and hearing participants on the
41 Partnership's website as soon as it is finalized.

42 *Will a power analysis be completed to determine whether sufficient baseline data have*
43 *been collected to detect any differences in future analyses?*

44 Yes, key results will be included in the report entitled Habitat Relationships and Wildlife
45 Habitat Quality Models for the Keeyask Region.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
 2 **Volume; Section: 7.2.5.1, 7.3.6, 7.4.6.2.1, 7.4.6.2.2, 7.5.1; Page No.:**
 3 **7.2.5.1, 7.3.6, 7.4.6.2.1, 7.4.6.2.2, 7.5.1**

4 **CEC Rd 2 MMF-0041a**

5 **ORIGINAL PREAMBLE AND QUESTION (MMF-0002a):**

6 EIS Scoping Document Reference: 4.1.3.6 Mammals: "The EIS will describe the following
 7 attributes in the applicable study area(s): ..Species composition, distribution and relative
 8 abundance of small mammals, furbearers, large carnivores and ungulates, Page 8 in
 9 relation to habitat including seasonal changes."

10 The Scoping Document (Section 4.1.3.6) sets out that the EIS will describe the
 11 composition, distribution, and relative abundance of ungulates. The EIS states that
 12 additional efforts were made to design studies and collect sufficient data to construct
 13 and validate "statistically derived multivariate habitat models" for mammal VECs (TE-SV-
 14 7.0, Section 7.2.5, p. 7-7). Section 7.3.6.1 discusses "expert information models" that
 15 were used to estimate the abundance of habitat available pre- and post-Project. The
 16 expert information models are described as being based on scientific literature and
 17 expert information (not statistically derived). Section 7.3.6.3.4 contains a Caribou
 18 Habitat Model discussion and Section 7.3.6.4.4 contains a Moose Model discussion;
 19 however, neither appear to be "statistically derived", nor do they appear to be
 20 statistically validated. Appendix 6A of the Response to EIS Guidelines lists an
 21 Environmental Study Report titled "Habitat relationships and wildlife habitat quality
 22 models for the Keeyask region" but does not provide a status or date completed.

23 The habitat model discussions require some additional information. It is critical to
 24 explain how suitability of islands and peatland complexes for calving caribou was
 25 determined as this information feeds into the impact assessment. The EIS states
 26 "Evidence of calving was documented on approximately 10% of the island in Gull and
 27 Stephens lakes and only 5% of the peatland complexes surveyed in 2010 and 2011,
 28 indicating that there is likely more habitat available than caribou are currently using."
 29 (TE-SV-7.0, Section 7.4.6.2, p. 7-112). Alternatively, this may indicate that the unused
 30 islands and peatland complexes may have characteristics that result in caribou
 31 avoidance of these sites. Since the EIS also identifies important moose calving and
 32 rearing habitat in the LSA to be similar to those used by summer resident caribou (TE-
 33 SV-7.0, Section 7.4.6.3.1, p. 7-124), the assumption that more calving habitat is available
 34 needs to be supported for moose as well. Project impact predictions require more
 35 consistent argumentation and clarity and support for assumptions made within the
 36 presented arguments.

37 Provide the reference to sections where the details on how “statistically derived
38 multivariate habitat models” for caribou and moose were generated and validated.

39 **FOLLOW-UP QUESTION:**

40 The Partnership references a document that is not yet available for review: Habitat
41 Relationships and Wildlife Habitat Quality Models for the Keeyask Region. Presumably
42 this document will contain details of caribou and moose model generation and
43 validation procedures as the Partnership’s response provides little new information.
44 Please see follow-up question from CEC Rd 1 MMF-0001a [see CEC Rd 2 MMF-0040a].

45 **RESPONSE:**

46 This document will contain details of caribou and moose model generation and
47 validation procedures. Please see the response to CEC Rd 2 MMF-0040a.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
 2 **Volume; Section: 7.2.5.1, 7.3.6, 7.4.6.2.1, 7.4.6.2.2, 7.5.1 ; Page No.:**
 3 **7-7, 7-57, 7-75, 7-112, 7-120, 7-124**

4 **CEC Rd 2 MMF-0041b**

5 **ORIGINAL PREAMBLE AND QUESTION (MMF-0002b):**

6 EIS Scoping Document Reference: 4.1.3.6 Mammals: "The EIS will describe the following
 7 attributes in the applicable study area(s): ..Species composition, distribution and relative
 8 abundance of small mammals, furbearers, large carnivores and ungulates, Page 8 in
 9 relation to habitat including seasonal changes."

10 The Scoping Document (Section 4.1.3.6) sets out that the EIS will describe the
 11 composition, distribution, and relative abundance of ungulates. The EIS states that
 12 additional efforts were made to design studies and collect sufficient data to construct
 13 and validate "statistically derived multivariate habitat models" for mammal VECs (TE-SV-
 14 7.0, Section 7.2.5, p. 7-7). Section 7.3.6.1 discusses "expert information models" that
 15 were used to estimate the abundance of habitat available pre- and post-Project. The
 16 expert information models are described as being based on scientific literature and
 17 expert information (not statistically derived). Section 7.3.6.3.4 contains a Caribou
 18 Habitat Model discussion and Section 7.3.6.4.4 contains a Moose Model discussion;
 19 however, neither appear to be "statistically derived", nor do they appear to be
 20 statistically validated. Appendix 6A of the Response to EIS Guidelines lists an
 21 Environmental Study Report titled "Habitat relationships and wildlife habitat quality
 22 models for the Keeyask region" but does not provide a status or date completed.

23 The habitat model discussions require some additional information. It is critical to
 24 explain how suitability of islands and peatland complexes for calving caribou was
 25 determined as this information feeds into the impact assessment. The EIS states
 26 "Evidence of calving was documented on approximately 10% of the island in Gull and
 27 Stephens lakes and only 5% of the peatland complexes surveyed in 2010 and 2011,
 28 indicating that there is likely more habitat available than caribou are currently using."
 29 (TE-SV-7.0, Section 7.4.6.2, p. 7-112). Alternatively, this may indicate that the unused
 30 islands and peatland complexes may have characteristics that result in caribou
 31 avoidance of these sites. Since the EIS also identifies important moose calving and
 32 rearing habitat in the LSA to be similar to those used by summer resident caribou (TE-
 33 SV-7.0, Section 7.4.6.3.1, p. 7-124), the assumption that more calving habitat is available
 34 needs to be supported for moose as well. Project impact predictions require more
 35 consistent argumentation and clarity and support for assumptions made within the
 36 presented arguments.

37 Provide the status or date completed for the Environmental Study Report titled "Habitat
38 relationships and wildlife habitat quality models for the Keeyask region". If available,
39 please provide the report to the Métis for review.

40 **FOLLOW-UP QUESTION:**

41 Please see follow-up question from CEC Rd 1 MMF-0001a [see CEC Rd 2 MMF-0040a].

42 **RESPONSE:**

43 Please see the response to CEC Rd 2 MMF-0040a.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
 2 **Volume; Section: 7.2.5.1, 7.3.6, 7.4.6.2.1, 7.4.6.2.2, 7.5.1; Page No.:**
 3 **7-7, 7-57, 7-75, 7-112, 7-120, 7-124**

4 **CEC Rd 2 MMF-0041c**

5 **ORIGINAL PREAMBLE AND QUESTION (MMF-0002c):**

6 EIS Scoping Document Reference: 4.1.3.6 Mammals: "The EIS will describe the following
 7 attributes in the applicable study area(s): ..Species composition, distribution and relative
 8 abundance of small mammals, furbearers, large carnivores and ungulates, Page 8 in
 9 relation to habitat including seasonal changes."

10 The Scoping Document (Section 4.1.3.6) sets out that the EIS will describe the
 11 composition, distribution, and relative abundance of ungulates. The EIS states that
 12 additional efforts were made to design studies and collect sufficient data to construct
 13 and validate "statistically derived multivariate habitat models" for mammal VECs (TE-SV-
 14 7.0, Section 7.2.5, p. 7-7). Section 7.3.6.1 discusses "expert information models" that
 15 were used to estimate the abundance of habitat available pre- and post-Project. The
 16 expert information models are described as being based on scientific literature and
 17 expert information (not statistically derived). Section 7.3.6.3.4 contains a Caribou
 18 Habitat Model discussion and Section 7.3.6.4.4 contains a Moose Model discussion;
 19 however, neither appear to be "statistically derived", nor do they appear to be
 20 statistically validated. Appendix 6A of the Response to EIS Guidelines lists an
 21 Environmental Study Report titled "Habitat relationships and wildlife habitat quality
 22 models for the Keeyask region" but does not provide a status or date completed.

23 The habitat model discussions require some additional information. It is critical to
 24 explain how suitability of islands and peatland complexes for calving caribou was
 25 determined as this information feeds into the impact assessment. The EIS states
 26 "Evidence of calving was documented on approximately 10% of the island in Gull and
 27 Stephens lakes and only 5% of the peatland complexes surveyed in 2010 and 2011,
 28 indicating that there is likely more habitat available than caribou are currently using."
 29 (TE-SV-7.0, Section 7.4.6.2, p. 7-112). Alternatively, this may indicate that the unused
 30 islands and peatland complexes may have characteristics that result in caribou
 31 avoidance of these sites. Since the EIS also identifies important moose calving and
 32 rearing habitat in the LSA to be similar to those used by summer resident caribou (TE-
 33 SV-7.0, Section 7.4.6.3.1, p. 7-124), the assumption that more calving habitat is available
 34 needs to be supported for moose as well. Project impact predictions require more
 35 consistent argumentation and clarity and support for assumptions made within the
 36 presented arguments.

37 Provide support for the assumption that “there is likely more habitat available than
38 caribou are currently using”. How was suitability of islands and peatland complexes for
39 caribou and moose calving determined?

40 **FOLLOW-UP QUESTION:**

41 The Partnership’s response contains qualitative information to support their
42 conclusions. For example, the Partnership states that “...it was apparent that higher
43 rates of use were evident for larger islands in lakes and peatland complexes”, but does
44 not indicate if this is a statistically significant difference in use. The Partnership
45 repeatedly refers to “comparisons” that have been made, but it appears these
46 comparisons are all qualitative in nature. Alternatively, perhaps more detailed
47 quantitative information will be contained within the, as yet, unavailable report: Habitat
48 Relationships and Wildlife Habitat Quality Models for the Keeyask Region. The
49 quantitative information being requested is critical for understanding and supporting
50 the series of arguments leading to conclusions regarding significance of impacts.
51 Without it, conclusions could be biased. Please see follow-up question from CEC Rd 1
52 MMF-0001a [see CEC Rd 2 MMF-0040a].

53 **RESPONSE:**

54 Please see the response to CEC Rd 2 MMF-0040a.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
 2 **Volume; Section: Section 1.4.4; 5.5 (Response to EIS Guidelines);**
 3 **Page No.: Table 1-4, p. 1-24; Figure 5-1, p. 5-9 (Response to EIS**
 4 **Guidelines)**

5 **CEC Rd 2 MMF-0042a**

6 **ORIGINAL PREAMBLE AND QUESTION (MMF-0003a):**

7 EIS Scoping Document Reference: 5.1.1 Criteria for Determining Significance: "The
 8 following criteria will be used to determine the significance of residual adverse
 9 environmental effects on each VEC: Nature (i.e., positive or negative) of the effect;
 10 Magnitude (i.e., severity) of the effect; Temporal boundaries (i.e., duration); and Spatial
 11 boundaries (i.e., geographic extent)...In assessing the significance of environmental
 12 effects on a VEC, the EIS may also discuss the frequency of effects, ecological context
 13 and the reversibility, where relevant."

14 The EIS discusses the approach used to determining "Regulatory Significance" (R to EIS,
 15 Section 5.5, p. 5-9). As per the Keeyask Generation Project Scoping Document (hereafter
 16 Scoping Document) Section 5.1.1, the EIS uses the "Magnitude" criterion to assist in
 17 determination of impact significance. In the EIS, the definition of moderate magnitude
 18 is: "Moderate – Effects that could be measured and could be determined within a
 19 normal range of variation of a well designed monitoring program; or are generally below
 20 or only marginally beyond guidelines or established thresholds of acceptable change; or
 21 are marginally beyond the range of natural variability or marginally beyond minimal
 22 impairment of ecosystem component's function". The definition of large magnitude is:
 23 "Large – Effects that are easily observable, measured and described (i.e., readily
 24 detectable without a monitoring program), and well beyond guidelines or established
 25 thresholds of acceptable changes, are well beyond the range of natural variability, or are
 26 well beyond minimal impairment of an ecosystem component's functions". (R to EIS,
 27 Section 5.5, p. 5-11). This implies that the ranges of natural variability (RNV) of
 28 populations are known. The current presentation of data for moose and caribou does
 29 not clearly indicate the RNV. The "Reversibility" criterion is only considered in "Step 2"
 30 of the regulatory significance assessment for those VECs that have an adverse effect and
 31 meet particular criteria (R to EIS, Section 5.3.1; Scoping Document 5.1.1). Reversible is
 32 defined as an "Effect that is reversible during the life of the Project" (R to EIS, Section
 33 5.3.1). All borrow areas (except portions of G-1 and G-3), all road footprints (except the
 34 north and south access roads and Butnau road upgrades), camp, work, and landfill areas
 35 would be decommissioned at the end of construction (TE-SV-1.0, Section 1.5.1, p. 1-30
 36 to 1-31). Under operations, camp, work, borrow, other temporarily cleared areas (TE-
 37 SV-1.0, Section 1.5.2, p. 1-32), and material placement areas will undergo some degree

Page 1 of 2

38 of rehabilitation (R to EIS, Section 4.6.16, p. 4-40). Unfortunately, “a detailed
39 decommissioning and rehabilitation plan for infrastructure not required for the
40 operation of the Project will be developed during the construction phase and provided
41 to regulators for review and approval” (R to EIS, Section 4.6.16, p. 4-41). Without a
42 rehabilitation plan, it is difficult to evaluate whether those areas identified for
43 rehabilitation will meet the reversibility criterion or whether the duration (“Step 1”) of
44 effects was accurately assessed.

45 Explain the concept of “regulatory significance” and provide reasoning and references
46 for its use in environmental impact assessment.

47 **FOLLOW-UP QUESTION:**

48 Please clarify whether the concept of “regulatory significance” indicates that the
49 regulators agree with the benchmarks used by the Partnership to determine
50 significance.

51 **RESPONSE:**

52 As stated in the initial response: “The term “regulatory significance” was adopted by the
53 Partnership in the EIS to help distinguish this very specific use of the term for regulatory
54 assessment purposes from other more common uses in very different contexts.”

55 In short, the term indicates that the analysis is prepared for the regulators in accordance
56 with the EIS Guidelines. It does not indicate that the regulators agree in advance with
57 what is submitted in accordance with the EIS Guidelines.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
 2 **Volume; Section: Section 1.4.4; 5.5 (Response to EIS Guidelines) ;**
 3 **Page No.: Table 1-4, p. 1-24; Figure 5-1, p. 5-9 (Response to EIS**
 4 **Guidelines)**

5 **CEC Rd 2 MMF-0042b**

6 **ORIGINAL PREAMBLE AND QUESTION (MMF-0003b):**

7 EIS Scoping Document Reference: 5.1.1 Criteria for Determining Significance: "The
 8 following criteria will be used to determine the significance of residual adverse
 9 environmental effects on each VEC: Nature (i.e., positive or negative) of the effect;
 10 Magnitude (i.e., severity) of the effect; Temporal boundaries (i.e., duration); and Spatial
 11 boundaries (i.e., geographic extent)...In assessing the significance of environmental
 12 effects on a VEC, the EIS may also discuss the frequency of effects, ecological context
 13 and the reversibility, where relevant."

14 The EIS discusses the approach used to determining "Regulatory Significance" (R to EIS,
 15 Section 5.5, p. 5-9). As per the Keeyask Generation Project Scoping Document (hereafter
 16 Scoping Document) Section 5.1.1, the EIS uses the "Magnitude" criterion to assist in
 17 determination of impact significance. In the EIS, the definition of moderate magnitude
 18 is: "Moderate – Effects that could be measured and could be determined within a
 19 normal range of variation of a well designed monitoring program; or are generally below
 20 or only marginally beyond guidelines or established thresholds of acceptable change; or
 21 are marginally beyond the range of natural variability or marginally beyond minimal
 22 impairment of ecosystem component's function". The definition of large magnitude is:
 23 "Large – Effects that are easily observable, measured and described (i.e., readily
 24 detectable without a monitoring program), and well beyond guidelines or established
 25 thresholds of acceptable changes, are well beyond the range of natural variability, or are
 26 well beyond minimal impairment of an ecosystem component's functions". (R to EIS,
 27 Section 5.5, p. 5-11). This implies that the ranges of natural variability (RNV) of
 28 populations are known. The current presentation of data for moose and caribou does
 29 not clearly indicate the RNV. The "Reversibility" criterion is only considered in "Step 2"
 30 of the regulatory significance assessment for those VECs that have an adverse effect and
 31 meet particular criteria (R to EIS, Section 5.3.1; Scoping Document 5.1.1). Reversible is
 32 defined as an "Effect that is reversible during the life of the Project" (R to EIS, Section
 33 5.3.1). All borrow areas (except portions of G-1 and G-3), all road footprints (except the
 34 north and south access roads and Butnau road upgrades), camp, work, and landfill areas
 35 would be decommissioned at the end of construction (TE-SV-1.0, Section 1.5.1, p. 1-30
 36 to 1-31). Under operations, camp, work, borrow, other temporarily cleared areas (TE-
 37 SV-1.0, Section 1.5.2, p. 1-32), and material placement areas will undergo some degree

Page 1 of 2

38 of rehabilitation (R to EIS, Section 4.6.16, p. 4-40). Unfortunately, “a detailed
 39 decommissioning and rehabilitation plan for infrastructure not required for the
 40 operation of the Project will be developed during the construction phase and provided
 41 to regulators for review and approval” (R to EIS, Section 4.6.16, p. 4-41). Without a
 42 rehabilitation plan, it is difficult to evaluate whether those areas identified for
 43 rehabilitation will meet the reversibility criterion or whether the duration (“Step 1”) of
 44 effects was accurately assessed.

45 Present data outlining the range of natural variability (RNV) and thresholds in moose
 46 and caribou populations (i.e., provide upper and lower targets in moose and caribou
 47 populations, beyond which adaptive management action would need to be
 48 implemented) that are being used to determine magnitude. Explain how one
 49 determines whether effects are “marginally” vs. “well-beyond” guidelines or the range
 50 of natural variability.

51 **FOLLOW-UP QUESTION:**

52 The Partnership does not have adequate data to describe the RNV for moose and
 53 summer resident caribou and the presence of migratory caribou are too variable in the
 54 regional study area. Therefore, the Partnership must rely on other criteria considered to
 55 determine the magnitude of the Project effects. “The magnitude of Project effects on
 56 moose and caribou was determined using benchmarks (TE SV Section 7.2.6), including
 57 physical habitat loss, intactness, linear feature density, gray wolf density, and harvest. If
 58 a benchmark is exceeded, additional mitigation or action may be considered, whether
 59 effects are marginally or well beyond guidelines.”

60 • Please see follow-up questions under CEC Rd 1 MMF-0006b [see CEC Rd 2 MMF-
 61 0045b].

62 As the MHSP has only just been made available for review, we have some information
 63 requests specific to the plan:

64 • Please see follow-up questions under CEC Rd 1 MMF-0001b above regarding the
 65 MHSP. [see CEC Rd 2 MMF-0040b].

66 **RESPONSE:**

67 Please see the responses to CEC Rd 2 MMF-0045b and CEC Rd 2 MMF-0040b.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
 2 **Volume; Section: Section 1.4.4; 5.5 (Response to EIS Guidelines);**
 3 **Page No.: Table 1-4, p. 1-24; Figure 5-1, p. 5-9 (Response to EIS**
 4 **Guidelines)**

5 **CEC Rd 2 MMF-0042c**

6 **ORIGINAL PREAMBLE AND QUESTION (MMF-0003c):**

7 EIS Scoping Document Reference: 5.1.1 Criteria for Determining Significance: "The
 8 following criteria will be used to determine the significance of residual adverse
 9 environmental effects on each VEC: Nature (i.e., positive or negative) of the effect;
 10 Magnitude (i.e., severity) of the effect; Temporal boundaries (i.e., duration); and Spatial
 11 boundaries (i.e., geographic extent)...In assessing the significance of environmental
 12 effects on a VEC, the EIS may also discuss the frequency of effects, ecological context
 13 and the reversibility, where relevant."

14 The EIS discusses the approach used to determining "Regulatory Significance" (R to EIS,
 15 Section 5.5, p. 5-9). As per the Keeyask Generation Project Scoping Document (hereafter
 16 Scoping Document) Section 5.1.1, the EIS uses the "Magnitude" criterion to assist in
 17 determination of impact significance. In the EIS, the definition of moderate magnitude
 18 is: "Moderate – Effects that could be measured and could be determined within a
 19 normal range of variation of a well designed monitoring program; or are generally below
 20 or only marginally beyond guidelines or established thresholds of acceptable change; or
 21 are marginally beyond the range of natural variability or marginally beyond minimal
 22 impairment of ecosystem component's function". The definition of large magnitude is:
 23 "Large – Effects that are easily observable, measured and described (i.e., readily
 24 detectable without a monitoring program), and well beyond guidelines or established
 25 thresholds of acceptable changes, are well beyond the range of natural variability, or are
 26 well beyond minimal impairment of an ecosystem component's functions". (R to EIS,
 27 Section 5.5, p. 5-11). This implies that the ranges of natural variability (RNV) of
 28 populations are known. The current presentation of data for moose and caribou does
 29 not clearly indicate the RNV.

30 The "Reversibility" criterion is only considered in "Step 2" of the regulatory significance
 31 assessment for those VECs that have an adverse effect and meet particular criteria (R to
 32 EIS, Section 5.3.1; Scoping Document 5.1.1). Reversible is defined as an "Effect that is
 33 reversible during the life of the Project" (R to EIS, Section 5.3.1). All borrow areas
 34 (except portions of G-1 and G-3), all road footprints (except the north and south access
 35 roads and Butnau road upgrades), camp, work, and landfill areas would be
 36 decommissioned at the end of construction (TE-SV-1.0, Section 1.5.1, p. 1-30 to 1-31).

37 Under operations, camp, work, borrow, other temporarily cleared areas (TE-SV-1.0,
 38 Section 1.5.2, p. 1-32), and material placement areas will undergo some degree of
 39 rehabilitation (R to EIS, Section 4.6.16, p. 4-40). Unfortunately, “a detailed
 40 decommissioning and rehabilitation plan for infrastructure not required for the
 41 operation of the Project will be developed during the construction phase and provided
 42 to regulators for review and approval” (R to EIS, Section 4.6.16, p. 4-41). Without a
 43 rehabilitation plan, it is difficult to evaluate whether those areas identified for
 44 rehabilitation will meet the reversibility criterion or whether the duration (“Step 1”) of
 45 effects was accurately assessed.

46 Identify and describe the rehabilitation target (time frame and vegetation target) and
 47 demonstrate that this target has been achieved elsewhere. Clarify if sites that are to be
 48 rehabilitated are considered “reversible” and if they are “medium-term” or “long-term”
 49 (i.e., how was rehabilitation considered in the determination of impact significance). If
 50 no examples of successful rehabilitation can be provided, re-assess impacts considering
 51 that sites cannot be rehabilitated.

52 **FOLLOW-UP QUESTION:**

53 The Partnership has not demonstrated that the vegetation targets have been achieved
 54 elsewhere, as requested in the original IR. While the Partnership indicates that the
 55 assessments used the total area of habitat affected prior to rehabilitation when
 56 determining the magnitude of effects on VECs, it is still unclear how reversibility and
 57 duration were predicted. The Partnership indicates that timeframes for rehabilitation
 58 depend on the target vegetation type which will not be determined until the completion
 59 of the Keyask Generation Project Vegetation Rehabilitation Plan. The Partnership
 60 indicates that determination of reversibility would be made after rehabilitation (i.e.,
 61 successful rehabilitation = reversible; unsuccessful rehabilitation = irreversible). We
 62 expect that a reversible impact on vegetation would mean the return to pre-disturbance
 63 conditions. If any vegetation type other than pre-disturbance condition is established,
 64 then the impact has not been reversed, particularly from a wildlife habitat point of view.

- 65 • Without the timeframe for rehabilitation, how did the Partnership determine
 66 whether duration of an effect was Medium-term vs. Long-term?
 67 • How did the Partnership make conclusions about significance in “Step 2” if one of
 68 the criteria (reversibility) is not given a value until some, as yet to be determined,
 69 date in the future? If the Partnership has not already done so, re-assess impacts
 70 considering that sites cannot be rehabilitated (i.e., long-term duration and
 71 irreversible). The Partnership does not have site-specific target vegetation types
 72 and time frames developed at this time. These will be provided in the Keyask
 73 Generation Project Vegetation Rehabilitation Plan.

- 74 · Will the Partnership commit to provide this report for review by the MMF once
 75 available?
 76 · Will this report provide quantitative definitions of rehabilitation, outline
 77 revegetation, and off-system marsh success?

78 **RESPONSE:**

79 As a clarification for the last sentence in the preamble to the follow-up questions, it is
 80 noted that the target habitat types (combinations of vegetation type and ecosite type)
 81 for rehabilitating areas not required for Project operation will be the native habitat
 82 types appropriate for the post-construction conditions (see response to TAC Public Rd 2
 83 EC-0029), which may be different from the pre-disturbance habitat type due to:

- 84 · Natural variability;
 85 · Giving preference to the most affected priority habitat types; and,
 86 · Post-construction conditions.

87 Because the natural dynamics of inland terrestrial ecosystems in the Terrestrial Habitat
 88 Regional Study Area are predominantly driven by wildfire and soil development, the
 89 post-fire vegetation type that develops on a site may be different than the one that was
 90 there prior to disturbance. Under natural conditions, a range of vegetation types can be
 91 found on a given ecosite type. On this basis, the target vegetation type will be selected
 92 from among those typically found on the ecosite conditions that can be developed at a
 93 location given post-construction conditions (see below).

94 When selecting from the natural range of vegetation types available for an ecosite type,
 95 preference will be given to selecting the priority habitat types expected to incur the
 96 highest cumulative effects as a means of reducing effects for these types (see Response
 97 to EIS Guidelines, Section 6.5.3.2.1).

98 In some locations, it will not be feasible to rehabilitate one of the habitat types naturally
 99 found on the pre-construction ecosite type due to the degree of site alteration during
 100 construction. For example, it would be very difficult to regenerate an aspen forest in a
 101 borrow area where the clay overburden was removed leaving coarse granular material.
 102 Another example is that a jack pine woodland could not be recreated in the portion of a
 103 granular borrow area where excavation has removed material to a depth where a pond
 104 forms. A marsh or other wetland type will be among the appropriate target habitat
 105 types in the latter situation. Consequently, in locations where construction has
 106 dramatically altered site conditions, the target habitat type will be a native habitat type
 107 that is appropriate for the post-construction site conditions giving preference to the
 108 most affected priority habitat types (see the response to TAC Public Rd 2 EC-0029 for
 109 further information).

110 Each of the specific questions outlined above are answered below.

111 *Without the timeframe for rehabilitation, how did the Partnership determine whether*
 112 *duration of an effect was Medium-term vs. Long-term?*

113 *How did the Partnership make conclusions about significance in "Step 2" if one of the*
 114 *criteria (reversibility) is not given a value until some, as yet to be determined, date in the*
 115 *future? If the Partnership has not already done so, re-assess impacts considering that*
 116 *sites cannot be rehabilitated (i.e., long-term duration and irreversible). The Partnership*
 117 *does not have site-specific target vegetation types and time frames developed at this*
 118 *time. These will be provided in the Keeyask Generation Project Vegetation Rehabilitation*
 119 *Plan.*

120 Terrestrial habitat effects were determined to be long-term and irreversible because
 121 terrestrial habitat losses in the permanent infrastructure and flooded areas are
 122 permanent. Considering these permanent losses and permanent habitat alterations, the
 123 likely Project residual effects on terrestrial habitat are expected to be adverse but
 124 regionally acceptable because no stand level habitat types are lost, the distribution of
 125 area amongst the stand level habitat types is not expected to change substantially and
 126 the cumulative area losses for all of the habitat types remains below 10% of their pre-
 127 development area. Using the criteria established to determine the significance of
 128 Project effects for regulatory purposes, the likely residual Project effects on terrestrial
 129 habitat are expected to be adverse, medium in geographic extent, long term in duration
 130 and, depending on the terrestrial habitat type either nil, small or moderate in
 131 magnitude. The moderate magnitude residual effects are expected to be irreversible,
 132 continuous in frequency, and low in ecological context.

133 *Will the Partnership commit to provide this report for review by the MMF once*
 134 *available?*

135 The Vegetation Rehabilitation Plan will be completed once construction is underway and
 136 the extent of required rehabilitation is understood. This plan will be placed on the
 137 Partnership's Web site once it is ready and will be included as part of the Project's
 138 Environmental Protection Program. The Web site provides contact information, and
 139 questions and comments from the public, including the MMF and its members, are
 140 welcome.

141 *Will this report provide quantitative definitions of rehabilitation, cutline revegetation,*
 142 *and off-system marsh success?*

143 The Keeyask Terrestrial Rehabilitation Plan will provide site specific rehabilitation
 144 targets and prescriptions for each location to be rehabilitated. The Plan will include
 145 quantitative measures such as the target number of trees per hectare.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
 2 **Volume; Section: 7.2.4.1. 7.4.6.2.2; Page No.: 7-5, 7-114**

3 **CEC Rd 2 MMF-0043a**

4 **ORIGINAL PREAMBLE AND QUESTION (MMF-0004a):**

5 EIS Scoping Document Reference: 5.1 Project Effects: "In reporting on the assessment
 6 of potential environmental effects, the EIS will describe the approach and methods used
 7 to identify and assess the effects, and it will also provide a record of assumptions and
 8 analyses that support the conclusions."

9 The Scoping Document (Section 5.1) sets out that assumptions and analyses that
 10 support conclusions regarding Project effects will be described. With respect to
 11 conclusions about the impact of Project related disturbance on caribou, the EIS does not
 12 present or reconcile differing statements when making conclusions about Project
 13 impact. The EIS states that "They [caribou] will often return to disturbed areas once the
 14 disturbance ends" and "Caribou show a high level of site fidelity and do not readily
 15 abandon suitable areas due to disturbance unless they are actively pursued (Tucker and
 16 Mahoney 1990; Dyke 2008)" (TE-SV-7.0, Section 7.4.6.2.2, p. 7-114).

17 However, KCNs noted that caribou are only now just returning to the local region since
 18 Kettle GS was constructed and that the Kettle GS changed the landscape (TE-SV-7.0,
 19 Section 7.2.4.1, p. 7-5). Construction of the Kettle GS was completed in 1974 and the
 20 date of this KCN comment is 2012 (TE-SV-7.0, Section 7.2.4.1, p. 7-5). The Partnership
 21 has committed to monitoring to verify the prediction that impacts to calving and rearing
 22 habitat (and thereby caribou populations) in the RSA will likely be negligible to small.
 23 However, the impact assessment would benefit from any support that can be provided
 24 by existing monitoring data from other GS's in the same watershed given the
 25 discrepancy between KCN observations and The Partnership's impact assessment. There
 26 are at least four other GS's on the Nelson River that should have data that could be used
 27 to inform this impact assessment.

28 Demonstrate that previously disturbed sites would be in pre-disturbance condition as
 29 far as human and predator access is concerned such that caribou would exhibit site
 30 fidelity.

31 **FOLLOW-UP QUESTION:**

32 The Partnership indicated that "Some caribou may avoid the area during construction,
 33 and others may remain despite the disturbance. Some of those that avoid the area are
 34 expected to return once the disturbance ends". They also indicated that "This prediction
 35 is currently being monitored at the Wuskwatim generating station, where caribou still

36 used calving habitat during construction in the area 2-4 km from the access road and
37 borrow areas." It appears that no quantitative evidence is yet available to support this
38 prediction. Monitoring programs will have to confirm these impact predictions for
39 caribou. No further questions at this time.

40 **RESPONSE:**

41 Quantitative evidence to support the prediction can be found in Manitoba Hydro (2011)
42 and is available at [http://keeyask.com/wp/wp-content/uploads/2013/07/Wuskwatim-
43 Generation-Project-Access-Road-Report-2004-2009-WRCS-June-20_2011.pdf](http://keeyask.com/wp/wp-content/uploads/2013/07/Wuskwatim-Generation-Project-Access-Road-Report-2004-2009-WRCS-June-20_2011.pdf). Also see
44 the Updated Caribou Sections, Supplemental Filings #2, available at
45 [http://keeyask.com/wp/wp-content/uploads/2013/07/02-Supplemental-Caribou-
46 Information.pdf](http://keeyask.com/wp/wp-content/uploads/2013/07/02-Supplemental-Caribou-Information.pdf), for current information related to caribou in the Keeyask Infrastructure
47 Project construction zone. Post-construction monitoring for the Wuskwatim Generation
48 Project has recently begun and no results are available at this time.

49 **REFERENCES:**

50 Manitoba Hydro. 2011. Wuskwatim Generation Project. Mammal Monitoring
51 Investigations for the Wuskwatim Generation Project Pre-construction and
52 Construction Report (2004-2009). Prepared for Manitoba Hydro by Wildlife
53 Resource Consulting Services MB Inc. Winnipeg, MB. 186 pp.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
 2 **Volume; Section: 7.2.4.1, 7.4.6.2.2; Page No.: 7-5, 7-114**

3 **CEC Rd 2 MMF-0043b**

4 **ORIGINAL PREAMBLE AND QUESTION (MMF-0004b):**

5 EIS Scoping Document Reference: 5.1 Project Effects: "In reporting on the assessment
 6 of potential environmental effects, the EIS will describe the approach and methods used
 7 to identify and assess the effects, and it will also provide a record of assumptions and
 8 analyses that support the conclusions."

9 The Scoping Document (Section 5.1) sets out that assumptions and analyses that
 10 support conclusions regarding Project effects will be described. With respect to
 11 conclusions about the impact of Project related disturbance on caribou, the EIS does not
 12 present or reconcile differing statements when making conclusions about Project
 13 impact. The EIS states that "They [caribou] will often return to disturbed areas once the
 14 disturbance ends" and "Caribou show a high level of site fidelity and do not readily
 15 abandon suitable areas due to disturbance unless they are actively pursued (Tucker and
 16 Mahoney 1990; Dyke 2008)" (TE-SV-7.0, Section 7.4.6.2.2, p. 7-114).

17 However, KCNs noted that caribou are only now just returning to the local region since
 18 Kettle GS was constructed and that the Kettle GS changed the landscape (TE-SV-7.0,
 19 Section 7.2.4.1, p. 7-5). Construction of the Kettle GS was completed in 1974 and the
 20 date of this KCN comment is 2012 (TE-SV-7.0, Section 7.2.4.1, p. 7-5). The Partnership
 21 has committed to monitoring to verify the prediction that impacts to calving and rearing
 22 habitat (and thereby caribou populations) in the RSA will likely be negligible to small.
 23 However, the impact assessment would benefit from any support that can be provided
 24 by existing monitoring data from other GS's in the same watershed given the
 25 discrepancy between KCN observations and The Partnership's impact assessment. There
 26 are at least four other GS's on the Nelson River that should have data that could be used
 27 to inform this impact assessment.

28 Can monitoring data from other projects be used to support this prediction, particularly
 29 given the discrepancy between KCN observations and The Partnership's impact
 30 assessment? Longer term results from monitoring programs for existing GS's should be
 31 used to inform the impact assessment.

32 **FOLLOW-UP QUESTION:**

33 The Partnership indicates that caribou still used calving habitat during construction of
 34 the Wuskwatim generating station. The article provided by the Partnership, Mahoney
 35 and Schaefer (2002), concluded that the hydroelectric development caused disruption

36 of migration during construction and in the longer-term diminished caribou use of the
37 range surrounding the project site. The Partnership does not have any technical
38 monitoring data from GS's that have been operating longer than the Wuskwatim
39 generating station that could be used to evaluate the conclusion regarding longer-term
40 impacts to caribou, as was requested in the original IR. The Partnership's conclusion
41 regarding impacts to caribou in the RSA seems to be counter to observations by the KCN
42 and by Mahoney and Schaefer (2002) and the Partnership did not provide the
43 quantitative monitoring information required to make an informed decision about the
44 effectiveness of past mitigation/management measures. No further questions at this
45 time.

46 **RESPONSE:**

47 In addition to the referral to the Wuskwatim generating station, and to clarify further,
48 the article provided by the Partnership was cited in the following context: "Sensory
49 disturbance could result in a temporary loss of effective calving and rearing habitat and
50 altered movements (Mahoney and Schaefer 2002)" (TE SV p. 7-114). Additionally, it was
51 noted in the EIS that "The level of disturbance expected during construction could
52 change animal distributions and influence migration rates" (TE SV p. 7-114). As such,
53 these outcomes were acknowledged by the Partnership as potential Project effects.

54 Data collected during field studies conducted from 2001 to 2013 and other information
55 presented in the TE SV (Section 7.3.6.3) and in the Supplemental Filing #2 Updated
56 Caribou Sections⁴, including Aboriginal Traditional Knowledge from the KCNs, indicate
57 that caribou have returned to areas around existing generating stations. Data collected
58 in and around the Kettle reservoir (Stephens Lake), a proxy area for the future Keeyask
59 reservoir, demonstrate that there is substantial caribou activity in the area, and summer
60 resident caribou are known to calve on islands in the reservoir. Please see CEC Rd 2
61 MMF-0043a for details about available monitoring information.

⁴ Available at <http://keeyask.com/wp/wp-content/uploads/2013/07/02-Supplemental-Caribou-Information.pdf>

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
 2 **Volume; Section: 7.4.6.2.1, 7.4.6.2.2 Valued Environmental**
 3 **Components - Caribou; Page No.: 7-113, 7-116, 7-121**

4 **CEC Rd 2 MMF-0044**

5 **ORIGINAL PREAMBLE AND QUESTION (MMF-0005):**

6 EIS Scoping Document Reference: Attachment C: "The Keeyask Generation Project (the
 7 Project) involves the operation of the following permanent infrastructure constructed as
 8 part of the Keeyask Infrastructure Project (KIP): North access road, including a clear-
 9 span bridge over Looking Back Creek and an upgrade at the intersection of the road."
 10 (Attachment C, Scoping Document); 5.1 Project Effects: In reporting on the assessment
 11 of potential environmental effects, the EIS will describe the approach and methods used
 12 to identify and assess the effects, and it will also provide a record of assumptions and
 13 analyses that support the conclusions."

14 The Scoping Document (Attachment C) indicates that the Keeyask Project requires use
 15 of the North access road and that the EIS will describe the approach and methods used
 16 to identify and assess Project effects (Section 5.1). With respect to the assessment of
 17 sensory disturbance and mortality on caribou, the EIS does not adequately describe the
 18 linkages between caribou and the changes caused by the Project during construction
 19 and operations. During construction, the EIS considers sensory disturbance and
 20 mortality due to wildlife-vehicle collisions on the south access road (TE-SV-7.0, Section
 21 7.4.6.2.1, p. 7-113). It does not appear that the north access road was considered as an
 22 impact on sensory disturbance and mortality for caribou during construction, even
 23 though it will be the main access route to the GS during construction and will likely
 24 receive higher human use than pre-Project (TE-SV-7.0, Section 7.4.6.2.1, p. 7-116).
 25 Under the operations scenario, both the north and south roads are considered and the
 26 EIS predicts that the risk of wildlife-vehicle collisions is unlikely to change (TE-SV-7.0,
 27 Section 7.4.6.2.2, p. 7-121).

28 Re-assess the loss of effective habitat in the LSA considering the north access road
 29 during construction.

30 **FOLLOW-UP QUESTION:**

31 Information request satisfied. The Partnership corrects a typographical error.

32 **RESPONSE:**

33 No response required.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
 2 **Volume; Section: N/A; Page No.: N/A**

3 **CEC Rd 2 MMF-0045a**

4 **ORIGINAL PREAMBLE AND QUESTION (MMF-0006a):**

5 EIS Scoping Document Reference: 5.1 Project Effects: "In reporting on the assessment
 6 of potential environmental effects, the EIS will describe the approach and methods used
 7 to identify and assess the effects, and it will also provide a record of assumptions and
 8 analyses that support the conclusions."

9 The Scoping Document (Section 5.1) sets out that assumptions and analyses that
 10 support conclusions regarding Project effects will be described. However, the EIS does
 11 not present adequate support for assumptions or premises when making predictions
 12 about Project impact on summer resident caribou. Furthermore, there is an
 13 inconsistency in the scale at which analyses are conducted and the scale at which
 14 conclusions are made.

15 The EIS states that "Because some of the summer resident caribou are likely coastal
 16 caribou, caribou are not using all of the calving and rearing habitat currently available in
 17 the Regional Study Area, and the proportion of undisturbed habitat is greater beyond
 18 the Regional Study Area, the effect of habitat disturbance on summer resident caribou is
 19 predicted to be small" (TE-SV-7.0, Section 7.4.6.2.1, p. 7-117). The EIS discusses a 65%
 20 undisturbed habitat benchmark, as recommended in the draft caribou recovery strategy
 21 (Environment Canada 2011; final version now available: Environment Canada 2012), in
 22 reference to the above impact prediction on boreal woodland caribou.

23 There are some assumptions in the above quote from the EIS that should be verified to
 24 support the prediction. Also, there is some confusion about the Zone being considered
 25 in this impact prediction. Zone 4 is the caribou LSA, Zone 6 is the caribou RSA, and Zone
 26 5 was used to assess Intactness (the degree to which a geographic area has not been
 27 subdivided into smaller areas by human features (TE-SV-7.0, Section 7.2.6.2, p. 7-9)).
 28 According to the EIS, Zone 5 is currently 48% intact or undisturbed and 36% of Zone 5 is
 29 less than 40 years old (R to EIS, Section 6.5.8.1.1, p. 6-372), but no similar estimates are
 30 provided for the caribou LSA or RSA. Furthermore, reference is made to undisturbed
 31 area "beyond the RSA" in the above quote, but no estimate of undisturbed area is
 32 provided. With the information provided and using the 65% undisturbed habitat
 33 benchmark (Environment Canada 2012), it appears that an insufficient amount of
 34 undisturbed habitat is currently available to support a sustainable woodland caribou
 35 population in Zone 5 (48% undisturbed). The conclusion of "small" Project impact is
 36 based on a scale ("beyond the RSA") for which no measures were provided. Given that

37 the amount of undisturbed habitat available in Zone 5 is below the recommended 65%
38 in the recovery strategy, any contribution, however small, could have negative
39 repercussions on the long-term viability of the population (See MMF IR #19 and 22).

40 Assumptions requiring verification: o Are all of the summer resident caribou actually
41 coastal caribou?

- 42 · Is the unused calving and rearing habitat in the RSA suitable?
- 43 · Is the proportion of undisturbed habitat greater beyond the RSA such that the 65%
44 benchmark of undisturbed habitat is met? (What is the estimate of undisturbed
45 habitat beyond the RSA? What area beyond the RSA is measured and considered in
46 this assessment on caribou?)

47 **FOLLOW-UP QUESTION:**

48 Regarding summer resident caribou being coastal caribou, it is understood that there is
49 uncertainty thus casting uncertainty on the impact predictions. An estimate of
50 undisturbed habitat beyond the RSA was provided for the Pen Islands caribou summer
51 range. We assume this is the range outlined in Figure 7-21 of TE-SV-7.0.

- 52 · Regarding the suitability of unused calving and rearing habitat, please refer to
53 response under CEC Rd 1 MMF-0002c [see CEC Rd 2 MMF-0040a].

54 **RESPONSE:**

55 To clarify, Map 7-21 does not depict undisturbed habitat for caribou; it delineates
56 caribou ranges in and around the Keeyask region. Undisturbed summer habitat for Pen
57 Islands coastal caribou beyond the Regional Study Area was estimated for the portion of
58 this area occupied by radio-collared summer residents. The original reference to CEC Rd
59 1 CEC-0037a as a source of additional information was incorrect. The estimate of
60 undisturbed habitat beyond the Regional Study Area is in CEC Rd 1 CEC-0037b (see Map
61 3).

62 Regarding the suitability of unused calving and rearing habitat, please refer to the
63 response to CEC Rd 2 MMF-0040a.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
 2 **Volume; Section: 7.4.6.2.1, 6.5.8.1.1; Page No.: 7-117, 6-369**

3 **CEC Rd 2 MMF-0045b**

4 **ORIGINAL PREAMBLE AND QUESTION (MMF-0006b):**

5 EIS Scoping Document Reference: 5.1 Project Effects: "In reporting on the assessment
 6 of potential environmental effects, the EIS will describe the approach and methods used
 7 to identify and assess the effects, and it will also provide a record of assumptions and
 8 analyses that support the conclusions."

9 The Scoping Document (Section 5.1) sets out that assumptions and analyses that
 10 support conclusions regarding Project effects will be described. However, the EIS does
 11 not present adequate support for assumptions or premises when making predictions
 12 about Project impact on summer resident caribou. Furthermore, there is an
 13 inconsistency in the scale at which analyses are conducted and the scale at which
 14 conclusions are made. The EIS states that "Because some of the summer resident
 15 caribou are likely coastal caribou, caribou are not using all of the calving and rearing
 16 habitat currently available in the Regional Study Area, and the proportion of
 17 undisturbed habitat is greater beyond the Regional Study Area, the effect of habitat
 18 disturbance on summer resident caribou is predicted to be small" (TE-SV-7.0, Section
 19 7.4.6.2.1, p. 7-117).

20 The EIS discusses a 65% undisturbed habitat benchmark, as recommended in the draft
 21 caribou recovery strategy (Environment Canada 2011; final version now available:
 22 Environment Canada 2012), in reference to the above impact prediction on boreal
 23 woodland caribou. There are some assumptions in the above quote from the EIS that
 24 should be verified to support the prediction. Also, there is some confusion about the
 25 Zone being considered in this impact prediction. Zone 4 is the caribou LSA, Zone 6 is the
 26 caribou RSA, and Zone 5 was used to assess Intactness (the degree to which a
 27 geographic area has not been subdivided into smaller areas by human features (TE-SV-
 28 7.0, Section 7.2.6.2, p. 7-9)).

29 According to the EIS, Zone 5 is currently 48% intact or undisturbed and 36% of Zone 5 is
 30 less than 40 years old (R to EIS, Section 6.5.8.1.1, p. 6-372), but no similar estimates are
 31 provided for the caribou LSA or RSA. Furthermore, reference is made to undisturbed
 32 area "beyond the RSA" in the above quote, but no estimate of undisturbed area is
 33 provided. With the information provided and using the 65% undisturbed habitat
 34 benchmark (Environment Canada 2012), it appears that an insufficient amount of
 35 undisturbed habitat is currently available to support a sustainable woodland caribou
 36 population in Zone 5 (48% undisturbed).

37 The conclusion of “small” Project impact is based on a scale (“beyond the RSA”) for
 38 which no measures were provided. Given that the amount of undisturbed habitat
 39 available in Zone 5 is below the recommended 65% in the recovery strategy, any
 40 contribution, however small, could have negative repercussions on the long-term
 41 viability of the population (See MMF IR #19 and 22).

42 Assess the effect of habitat disturbance on summer resident caribou for the defined
 43 caribou study areas. Alternatively, justify the selection of a larger study area than the
 44 caribou RSA as the basis for the predicted impact on summer resident caribou and
 45 provide associated measure of intactness.

46 **FOLLOW-UP QUESTION:**

47 The Partnership presents revised calculations for summer resident caribou. They
 48 present new calculations of disturbed habitat based on Study Zone 6 (RSA) and Study
 49 Zone 5, making adjustments to the calculation method based on Environment Canada
 50 (2012). Study Zone 5 was described as being more appropriate to assess changes in
 51 intactness on a summer resident caribou population hypothesized to be boreal
 52 woodland caribou, while Study Zone 6 was chosen as the regional study area for all
 53 caribou types to account for the large ranges of migratory herds. Overall, there is
 54 uncertainty regarding the exact core range of summer resident caribou and uncertainty
 55 as to whether they are coastal, boreal woodland, or a mixture of both caribou types.
 56 The amount of undisturbed habitat with the Project within Zone 5 is now 63.9% (36.1%
 57 disturbed) and within Zone 6 is now 65.8% (34.2% disturbed). The benchmark identified
 58 in the caribou recovery strategy (Environment Canada 2012) is 65% undisturbed habitat.
 59 The 65% undisturbed habitat threshold provided by Environment Canada (2012) is a
 60 minimum threshold “because at 65% undisturbed habitat there remains a significant risk
 61 (40%) that local populations will not be self-sustaining.” Depending on how the summer
 62 resident caribou herd is defined, the impact of the project either results in an
 63 exceedence of the EC benchmark (Zone 5 calculation) or close to an exceedence (Zone 6
 64 calculation). Given that:

- 65 • the amount of undisturbed habitat available in Zone 5 is below the recommended
- 66 65% in the recovery strategy
- 67 • the amount of undisturbed habitat available in Zone 6 is within 0.8% of the
- 68 recommended 65% in the recovery strategy
- 69 • the uncertainty regarding the exact core range of summer resident caribou and
- 70 uncertainty as to whether they are coastal, boreal woodland, or a mixture of both
- 71 caribou types there could be significant negative repercussions on the long-term
- 72 viability of the summer resident caribou population.

73 Please explain why a 35-40% disturbed habitat (60-65% undisturbed habitat) only
74 corresponds to a moderate magnitude effect give the associated risk of the population
75 not being self-sustaining at 65% undisturbed habitat.

76 **RESPONSE:**

77 It should be noted that for the EIS that these values were treated as benchmarks, and
78 not thresholds. Thresholds imply that these values are absolute 'tipping points' where
79 this is rarely the case when interpreting ecological gradients. Secondly, the
80 interpretation of the Environment Canada's values is somewhat precautionary, because
81 if the immediate Thompson area were excluded from these calculations, the values
82 reported would be slightly higher. Also of note, the values between 55-65% intactness
83 (or conversely between 35-45% total disturbance) are identified as a moderate level of
84 risk in Environment Canada's (2011) assessment of risk and identification of
85 management thresholds.

86 It is correct that there is a level of uncertainty in assessing effects to caribou. Because
87 this was noted to be the case, the effects assessment used all information available to
88 draw conclusions. Several benchmarks in addition to intactness were used in the
89 determination of the significance of potential Project effects on caribou: physical habitat
90 loss (including calving and winter habitat), linear feature density, and gray wolf density.
91 Using these benchmarks, literature, field studies and professional judgement, it was
92 concluded that residual Project effects on caribou will likely be adverse but small based
93 on all of the benchmarks, and not exclusively based on the Environment Canada
94 intactness thresholds (see Response to EIS Guidelines Section 6.5.8.1 and CEC Rd 1 CEC-
95 0037a).

96 **REFERENCES:**

97 Environment Canada. 2011. Scientific assessment to inform the identification of critical
98 habitat for woodland caribou (*Rangifer tarandus caribou*), Boreal Population, in
99 Canada: 2011 update. Ottawa, ON. 102 pp.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
 2 **Volume; Section: 7.4.6.2.1 Valued Environmental Components -**
 3 **Caribou; Chapter 6, Section 6.5.8.1.1 Construction Effects and**
 4 **Mitigation - Caribou (Response to EIS Guidelines); Page No.: 7-117;**
 5 **6-369**

6 **CEC Rd 2 MMF-0045c**

7 **ORIGINAL PREAMBLE AND QUESTION (MMF-006c):**

8 EIS Scoping Document Reference: 5.1 Project Effects: "In reporting on the assessment
 9 of potential environmental effects, the EIS will describe the approach and methods used
 10 to identify and assess the effects, and it will also provide a record of assumptions and
 11 analyses that support the conclusions."

12 The Scoping Document (Section 5.1) sets out that assumptions and analyses that
 13 support conclusions regarding Project effects will be described. However, the EIS does
 14 not present adequate support for assumptions or premises when making predictions
 15 about Project impact on summer resident caribou. Furthermore, there is an
 16 inconsistency in the scale at which analyses are conducted and the scale at which
 17 conclusions are made.

18 The EIS states that "Because some of the summer resident caribou are likely coastal
 19 caribou, caribou are not using all of the calving and rearing habitat currently available in
 20 the Regional Study Area, and the proportion of undisturbed habitat is greater beyond
 21 the Regional Study Area, the effect of habitat disturbance on summer resident caribou is
 22 predicted to be small" (TE-SV-7.0, Section 7.4.6.2.1, p. 7-117). The EIS discusses a 65%
 23 undisturbed habitat benchmark, as recommended in the draft caribou recovery strategy
 24 (Environment Canada 2011; final version now available: Environment Canada 2012), in
 25 reference to the above impact prediction on boreal woodland caribou. There are some
 26 assumptions in the above quote from the EIS that should be verified to support the
 27 prediction. Also, there is some confusion about the Zone being considered in this impact
 28 prediction. Zone 4 is the caribou LSA, Zone 6 is the caribou RSA, and Zone 5 was used to
 29 assess Intactness (the degree to which a geographic area has not been subdivided into
 30 smaller areas by human features (TE-SV-7.0, Section 7.2.6.2, p. 7-9)). According to the
 31 EIS, Zone 5 is currently 48% intact or undisturbed and 36% of Zone 5 is less than 40
 32 years old (R to EIS, Section 6.5.8.1.1, p. 6-372), but no similar estimates are provided for
 33 the caribou LSA or RSA. Furthermore, reference is made to undisturbed area "beyond
 34 the RSA" in the above quote, but no estimate of undisturbed area is provided. With the
 35 information provided and using the 65% undisturbed habitat benchmark (Environment
 36 Canada 2012), it appears that an insufficient amount of undisturbed habitat is currently

37 available to support a sustainable woodland caribou population in Zone 5 (48%
38 undisturbed). The conclusion of "small" Project impact is based on a scale ("beyond the
39 RSA") for which no measures were provided. Given that the amount of undisturbed
40 habitat available in Zone 5 is below the recommended 65% in the recovery strategy, any
41 contribution, however small, could have negative repercussions on the long-term
42 viability of the population (See MMF IR #19 and 22).

43 Explain why no measures of undisturbed habitat are provided for the caribou LSA and
44 RSA? (What data are used as the foundation of the impact assessment for habitat
45 disturbance on summer resident caribou?)

46 **FOLLOW-UP QUESTION:**

47 Information request satisfied. Measures are provided for the RSA.

48 **RESPONSE:**

49 No response required.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
 2 **Volume; Section: 7.4.6.2.2 Valued Environmental Components -**
 3 **Caribou ; Page No.: 7-121 to 7-122; 78-79 (FLCN 2012)**

4 **CEC Rd 2 MMF-0046a**

5 **ORIGINAL PREAMBLE AND QUESTION (MMF-0007a):**

6 EIS Scoping Document Reference: 5.1 Project Effects: “In reporting on the assessment
 7 of potential environmental effects, the EIS will describe the approach and methods used
 8 to identify and assess the effects, and it will also provide a record of assumptions and
 9 analyses that support the conclusions.”

10 The Scoping Document (Section 5.1) sets out that assumptions and analyses that
 11 support conclusions regarding Project effects will be described. With respect to
 12 conclusions about the impact of Project altered ice conditions on caribou, the EIS does
 13 not reconcile differing accounts using data or references when making conclusions
 14 about Project impact. Concerns about caribou falling through the ice and drowning due
 15 to altered ice conditions were raised by the FLCN (FLCN 2012, p. 78-79).

16 The EIS concludes that caribou drowning is unlikely because “once the ice has
 17 formed...post-Project conditions include the formation of a stable ice cover on the
 18 reservoir..., including maintaining a steady reservoir level during freeze-up and
 19 monitoring ice thickness..., and less variation in water levels once the reservoir is
 20 established relative to current conditions” (TE-SV-7.0, Section 7.4.6.2.2, p. 7-121).

21 The impact assessment would benefit from any support that can be provided by existing
 22 monitoring data from other GS’s in the same watershed given the discrepancy between
 23 KCN observations and The Partnerships impact assessment. There are at least four other
 24 GS’s on the Nelson River that should have data that could be used to inform this impact
 25 assessment. The EIS states that “There is no mitigation for dam failure” (TE-SV-7.0,
 26 Section 7.4.6.2.2, p. 7-122), but does not indicate the likelihood of dam failure and does
 27 not describe the potential impact on caribou. This should be explained so that affected
 28 groups can have a complete understanding of potential Project effects.

29 Describe any mitigation proposed to manage impacts of an altered ice regime (thin ice,
 30 air pockets under ice) on caribou mortality.

31 **FOLLOW-UP QUESTION:**

32 Can the Partnership please define what they would consider a “population-level effect”
 33 on the summer resident caribou herd estimated to be about 20-50 animals?

34 **RESPONSE:**

35 To clarify, the size of the summer resident caribou herd located in the Caribou Regional
36 Study Area (Zone 6) was qualified and quantified in the response to information request
37 CEC Rd1 CEC-0037a, and ranges between 275-688 animals. The 20-50 animals being
38 referred to are part of the sub-population during summer found in the Caribou Local
39 Study Area. Hypothetically, if all these summer resident animals were boreal woodland
40 caribou, these animals would belong to a smaller population estimated in Zone 5
41 between 128-320 animals. Please also see response CEC Rd 2 CEC-0105.

42 A population-level effect is defined as an effect that increases mortality to a sufficiently
43 high level that exceeds reproduction and immigration, and, over time, may result in a
44 population that is no longer self-sustaining. Sensitivity analyses have been used to
45 identify demographic trends of ungulate populations and what impact the loss of
46 animals has on a population as a whole. Notably, adult female mortality has a
47 disproportionate effect on population dynamics, based on the reduced reproductive
48 potential of a population, in comparison with calf mortality rates which are much more
49 variable (Gailliard et al. 1998). The extent to which the reduction of adult females
50 through mortality will affect a caribou population can be related to the ratio of adult
51 female mortalities to the size of the population as a whole.

52 Given the uncertainty regarding the affiliation or herd status of summer resident
53 caribou, it is not possible to speak with high certainty with regard to population-level
54 effects on these animals. On the one hand, should these animals prove to be essentially
55 a subset of the Pen Islands herd, which is currently assessed as having thousands of
56 animals (Manitoba Hydro 2012), the loss of a few individuals within the Caribou Local
57 Study Area from the 20-50 animals (only a portion of which would be adult females)
58 would likely not have a substantive population-level effect. Alternately, if these animals
59 represent a unique boreal woodland caribou grouping that consists of considerably
60 fewer individuals, the loss of individual caribou would demonstrate a larger scale
61 population-level effect.

62 To this extent, it is unlikely that a self-sufficient boreal woodland caribou population
63 exists that does not also depend on additional caribou outside of the Caribou Local
64 Study Area. The 20-50 animals estimated inside the Caribou Local Study Area should be
65 treated as part of a considerably larger grouping (again, between 275-688 animals). This
66 has in part been demonstrated through the assessment of radio-collared Pen Islands
67 caribou using islands in the Caribou Local Study Area during the calving and rearing
68 season and engaging in large migratory movements outside of the Caribou Local Study
69 Area during the winter season (Manitoba Hydro 2012). For more information on the
70 potential number of caribou in Study Zone 5 and the Caribou Regional Study Area please
71 refer to the response to CEC Rd 1 CEC-0037a.

72 **REFERENCES:**

73 Gaillard, J.-M., M. Festa-Bianchet, and N.G. Yoccoz. 1998. Population dynamics of large
74 herbivores: variable recruitment with constant adult survival. *Trends in Ecology
75 and Evolution* 13(2): 58-63.

76 Manitoba Hydro. 2012. Bipole III Transmission Project supplemental caribou technical
77 report. Prepared for Manitoba Hydro by Joro Consultants Inc. Winnipeg, MB.
78 108 pp.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
 2 **Volume; Section: 7.4.6.2.2 Valued Environmental Components -**
 3 **Caribou; Page No.: 7-121 to 7-122; 78-79 (FLCN 2012)**

4 **CEC Rd 2 MMF-0046b**

5 **ORIGINAL PREAMBLE AND QUESTION (MMF-0007b):**

6 EIS Scoping Document Reference: 5.1 Project Effects: "In reporting on the assessment
 7 of potential environmental effects, the EIS will describe the approach and methods used
 8 to identify and assess the effects, and it will also provide a record of assumptions and
 9 analyses that support the conclusions."

10 The Scoping Document (Section 5.1) sets out that assumptions and analyses that
 11 support conclusions regarding Project effects will be described. With respect to
 12 conclusions about the impact of Project altered ice conditions on caribou, the EIS does
 13 not reconcile differing accounts using data or references when making conclusions
 14 about Project impact. Concerns about caribou falling through the ice and drowning due
 15 to altered ice conditions were raised by the FLCN (FLCN 2012, p. 78-79).

16 The EIS concludes that caribou drowning is unlikely because "once the ice has
 17 formed...post-Project conditions include the formation of a stable ice cover on the
 18 reservoir..., including maintaining a steady reservoir level during freeze-up and
 19 monitoring ice thickness..., and less variation in water levels once the reservoir is
 20 established relative to current conditions" (TE-SV-7.0, Section 7.4.6.2.2, p. 7-121).

21 The impact assessment would benefit from any support that can be provided by existing
 22 monitoring data from other GS's in the same watershed given the discrepancy between
 23 KCN observations and The Partnerships impact assessment. There are at least four other
 24 GS's on the Nelson River that should have data that could be used to inform this impact
 25 assessment. The EIS states that "There is no mitigation for dam failure" (TE-SV-7.0,
 26 Section 7.4.6.2.2, p. 7-122), but does not indicate the likelihood of dam failure and does
 27 not describe the potential impact on caribou. This should be explained so that affected
 28 groups can have a complete understanding of potential Project effects.

29 Can monitoring data from other projects be used to support this prediction, particularly
 30 given the discrepancy between KCN observations and The Partnerships impact
 31 assessment?

32 **FOLLOW-UP QUESTION:**

33 The Partnership does not have any technical monitoring data from existing GS's that
 34 could be used to evaluate the conclusion regarding altered ice conditions on caribou, as

35 was requested in the original IR. Caribou drowning reports will be investigated and
36 reported in the Partnership's Terrestrial Effects Monitoring plan. No further questions at
37 this time.

38 **RESPONSE:**

39 No response required.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
 2 **Volume; Section: 7.4.6.2.2 Valued Environmental Components -**
 3 **Caribou ; Page No.: 7-121 to 7-122; 78-79 (FLCN 2012)**

4 **CEC Rd 2 MMF-0046c**

5 **ORIGINAL PREAMBLE AND QUESTION (MMF-0007c):**

6 EIS Scoping Document Reference: 5.1 Project Effects: "In reporting on the assessment
 7 of potential environmental effects, the EIS will describe the approach and methods used
 8 to identify and assess the effects, and it will also provide a record of assumptions and
 9 analyses that support the conclusions."

10 The Scoping Document (Section 5.1) sets out that assumptions and analyses that
 11 support conclusions regarding Project effects will be described. With respect to
 12 conclusions about the impact of Project altered ice conditions on caribou, the EIS does
 13 not reconcile differing accounts using data or references when making conclusions
 14 about Project impact. Concerns about caribou falling through the ice and drowning due
 15 to altered ice conditions were raised by the FLCN (FLCN 2012, p. 78-79).

16 The EIS concludes that caribou drowning is unlikely because "once the ice has
 17 formed...post-Project conditions include the formation of a stable ice cover on the
 18 reservoir..., including maintaining a steady reservoir level during freeze-up and
 19 monitoring ice thickness..., and less variation in water levels once the reservoir is
 20 established relative to current conditions" (TE-SV-7.0, Section 7.4.6.2.2, p. 7-121).

21 The impact assessment would benefit from any support that can be provided by existing
 22 monitoring data from other GS's in the same watershed given the discrepancy between
 23 KCN observations and The Partnerships impact assessment. There are at least four other
 24 GS's on the Nelson River that should have data that could be used to inform this impact
 25 assessment. The EIS states that "There is no mitigation for dam failure" (TE-SV-7.0,
 26 Section 7.4.6.2.2, p. 7-122), but does not indicate the likelihood of dam failure and does
 27 not describe the potential impact on caribou. This should be explained so that affected
 28 groups can have a complete understanding of potential Project effects.

29 Explain the likelihood of dam failure and the potential impact on caribou.

30 **FOLLOW-UP QUESTION:**

31 The Partnership refers to their response TAC Public Rd 2 CEAA-0009, which we assume
 32 was a typographical error and they intended to direct us to TAC Public Rd 1 CEAA-0009.
 33 This response only indicates that dam failure is "extremely unlikely" and does not

34 discuss any impacts on caribou, as requested in the original IR. No further questions at
35 this time.

36 **RESPONSE:**

37 To clarify, TAC Public Rd 1 CEAA-0009 was filed in Rd 1 and added to in TAC Public Rd 2
38 CEAA-0009.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
 2 **Volume; Section: 7.4.6.2.2 Valued Environmental Components -**
 3 **Caribou ; Page No.: 7-121**

4 **CEC Rd 2 MMF-0047a**

5 **ORIGINAL PREAMBLE AND QUESTION (MMF-0008a):**

6 EIS Scoping Document Reference: 5.1 Project Effects: “Measures to mitigate potential
 7 effects that are technically and economically feasible will be identified. Potential effects
 8 that remain after the application of mitigation measures will be considered to be
 9 potential residual effects”

10 The Scoping Document (Section 5.1) indicates that the EIS will describe the approach
 11 and methods used to identify and assess Project effects (Section 5.1). The EIS states that
 12 “This new section of PR 280 could increase local caribou hunting activity by domestic
 13 resource users” (TE-SV-7.0, Section 7.4.6.2.2, p. 7-121).

14 The EIS concludes that harvest of LSA caribou populations is not expected to affect the
 15 broader regional harvest, and thus, the effect is expected to be small. It is not clear if
 16 the predicted Project impact is similar for the different caribou herds in the Keeyask
 17 region. The Scoping Document (Section 5.1) sets out that measures to mitigate
 18 potential effects that are technically and economically feasible will be identified, but
 19 more specific details are required to understand how Project impacts might be
 20 managed.

21 The EIS refers to Adverse Effects Agreements (AEA) offsetting programs that will result
 22 in alternate harvesting opportunities in the SLRMA to offset loss of TR due to the Project
 23 and to disperse harvest pressure in the LSA (TE-SV-7.0, Section 7.4.6.2.2, p.7-121). No
 24 details are provided of precisely how AEA offsetting programs will disperse existing
 25 harvest pressure. AEA offsetting programs mitigate impacts to First Nations Project
 26 partners by providing alternative harvesting opportunities. No reference was made to
 27 how other potential harvesters, such as Métis members, will be managed.

28 Describe how the effect of harvest on caribou populations differs between barren-
 29 ground and summer resident caribou.

30 **FOLLOW-UP QUESTION:**

31 Information request satisfied. The Partnership provided details on the effect of harvest
 32 on the different caribou populations.

- 33 **RESPONSE:**
- 34 No response required.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
 2 **Volume; Section: 7.4.6.2.2 Valued Environmental Components -**
 3 **Caribou; Page No.: 7-121**

4 **CEC Rd 2 MMF-0047b**

5 **ORIGINAL PREAMBLE AND QUESTION (MMF-0008b):**

6 EIS Scoping Document Reference: 5.1 Project Effects: “Measures to mitigate potential
 7 effects that are technically and economically feasible will be identified. Potential effects
 8 that remain after the application of mitigation measures will be considered to be
 9 potential residual effects”

10 The Scoping Document (Section 5.1) indicates that the EIS will describe the approach
 11 and methods used to identify and assess Project effects (Section 5.1). The EIS states that
 12 “This new section of PR 280 could increase local caribou hunting activity by domestic
 13 resource users” (TE-SV-7.0, Section 7.4.6.2.2, p. 7-121).

14 The EIS concludes that harvest of LSA caribou populations is not expected to affect the
 15 broader regional harvest, and thus, the effect is expected to be small. It is not clear if
 16 the predicted Project impact is similar for the different caribou herds in the Keeyask
 17 region. The Scoping Document (Section 5.1) sets out that measures to mitigate
 18 potential effects that are technically and economically feasible will be identified, but
 19 more specific details are required to understand how Project impacts might be
 20 managed.

21 The EIS refers to Adverse Effects Agreements (AEA) offsetting programs that will result
 22 in alternate harvesting opportunities in the SLRMA to offset loss of TR due to the Project
 23 and to disperse harvest pressure in the LSA (TE-SV-7.0, Section 7.4.6.2.2, p.7-121). No
 24 details are provided of precisely how AEA offsetting programs will disperse existing
 25 harvest pressure. AEA offsetting programs mitigate impacts to First Nations Project
 26 partners by providing alternative harvesting opportunities. No reference was made to
 27 how other potential harvesters, such as Métis members, will be managed.

28 Provide the details of the components of the AEA offsetting program that function as
 29 mitigation for harvesting effects on caribou populations. Do these programs give
 30 consideration to Métis harvest in the region? How will residual adverse effects on Métis
 31 be offset?

32 **FOLLOW-UP QUESTION:**

33 The Partnership indicates in their response that “to date caribou have not been
 34 explicitly identified as a large game species harvested by Metis in any location in the

35 Resource Use Regional Study Area.” The Partnership goes on to say that a Metis-specific
36 Traditional Land Use and Knowledge Study, socio-economic impact assessment and
37 historical narrative for the Keeyask region will be undertaken.

38 · Does the Partnership intend to revisit the impact assessment for caribou if the
39 Manitoba Metis impact assessment indicates caribou hunting within the terrestrial
40 Regional Study Area?

41 **RESPONSE:**

42 The Partnership remains committed to considering any additional information provided
43 on the use of lands and resources for traditional purposes by the Metis. The Partnership
44 is committed to further dialogue with the MMF so that it can determine how best to
45 incorporate this new information into planning and development processes for the
46 Keeyask Generation Project, once it is available.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
 2 **Volume; Section: Sections 7.4.2.1.4, 7.4.6.2.1, 7.4.6.2.2, 7.4.6.2.3**
 3 **(TE SV); Section 6.5.8.1.1, 4.6.3, 6.5.8 (R to EIS); Section 3.3.2 (PD**
 4 **SV) ; Page No.: 7-90, 7-117, 7-121 to 7-124, Map 7-27 (TE SV); 6-**
 5 **371, 4-34, 6-367 (R to EIS); 3-14 (PD SV)**

6 **CEC Rd 2 MMF-0048a**

7 **ORIGINAL PREAMBLE AND QUESTION (MMF-0009a):**

8 EIS Scoping Document Reference: 5.1 Project Effects: “Measures to mitigate potential
 9 effects that are technically and economically feasible will be identified. Potential effects
 10 that remain after the application of mitigation measures will be considered to be
 11 potential residual effects;”

12 The Scoping Document (Section 5.1) sets out that measures to mitigate potential effects
 13 that are technically and economically feasible will be identified, but more specific details
 14 are required to understand how Project impacts might be managed. The EIS indicates a
 15 “high confidence” (TE-SV-7.0, Section 7.4.6.2.3, p. 7-124) in the ability to mitigate and
 16 manage potential Project effects on caribou, yet the EIS provides little detail on
 17 proposed mitigation measures and does not appear to have provided the details of
 18 some plans intended to outline mitigation measures. It is difficult, if not impossible, to
 19 understand residual Project effects (and conclusions regarding the magnitude, extent,
 20 duration, and direction of residual effects) without a complete understanding of the
 21 proposed mitigation measures and the effectiveness of those measures. Details of how
 22 mitigation success will be measured, including targets or definitions of success, are not
 23 provided. The following proposed mitigation measures require more information in
 24 order to have a better understanding of how Project impacts might be managed:

- 25 • “Use of the access roads by resources users will be addressed in the Construction
 26 Access Management Plan” (TE-SV-7.0, Section 7.4.6.2.1, p. 7-117). During
 27 operations, the EIS indicates that Project-related cutlines and trails will be blocked
 28 and portions re-vegetated (Section 7.4.6.2.2, p. 7-123). The Preliminary
 29 Construction Access Management Plan ([http://keeyask.com/wp/wp-](http://keeyask.com/wp/wp-content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-CD-version.pdf)
 30 [content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-](http://keeyask.com/wp/wp-content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-CD-version.pdf)
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 32 assume responsibility for the north and south access roads (with permanent river
 33 crossing) once construction is completed. It is not clear if any further mitigation
 34 measures are proposed to manage increased access created by the upgraded and
 35 permanent north and south roads once construction is complete.

- 36 • “Roadside ditches will be rehabilitated with native plants with low quality food
 37 value for caribou where practicable, to minimize attraction and the risk of collisions
 38 and harvest opportunities” (TE-SV-7.0, Section 7.4.6.2.1, p. 7-118), but no
 39 description or list of the native plant species to be used is provided.
- 40 • First Nations indicated concerns about hindered access by wildlife due to debris
 41 accumulation on shorelines upon flooding. The EIS concluded a negligible to small
 42 effect on local caribou movement along shorelines due to implementation of the
 43 Forebay Clearing Plan and Waterways Management Plan (TE-SV-7.0, Section
 44 7.4.6.2.2, p. 7-121). A Reservoir Clearing Plan for the Keeyask Project
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 49 included within either report.
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 51 converge on the site (TE-SV-7.0, Section 7.4.2.1.4, p. 7-90, Map 7-27). It is not clear
 52 what mitigation measures are proposed to specifically address this scenario for
 53 caribou.
- 54 • Blasting restrictions will be put in place with respect to caribou calving season
 55 (Project Description SV, Section 3.3.2, p. 3-14), but it is not clear what mitigation is
 56 in place for blasting during other times caribou are present in the Keeyask region.
- 57 • “A plan is being developed to coordinate caribou mitigation and monitoring
 58 activities among MH’s northern developments, as well as with government
 59 authorities and existing caribou committees and management boards” (TE-SV-7.0,
 60 Section 7.4.6.2.2, p. 7-123). No timeframe was provided for when this plan could be
 61 available for review by affected parties.

62 Indicate if there will be any ongoing mitigation of increased access by resource users,
 63 created by the upgraded and permanent north and south roads, upon completion of
 64 construction. If so, please describe.

65 **FOLLOW-UP QUESTION:**

66 The Partnership indicates that no mitigation measures directed at effects of increased
 67 access by resource users are planned during operation and that this is within the
 68 mandate of MCWS. Based on the response, it is uncertain what mitigation measures
 69 might be in place, if any, for the north and south access roads during operations,
 70 whether or not mitigation success will be measured, who is responsible for measuring it,
 71 and how it will be measured (No definitions or targets for mitigation success have been
 72 provided).

- 73 • Will the outcome of discussions between the Partnership and MCWS be made
74 available to the MMF for comment?
75 • Has the impact assessment for caribou taken into consideration that there may not
76 be any mitigation measures directed at increased access by resource users during
77 operations?
78 • Please refer to follow-up questions under CEC Rd 1 MMF-0009g below [MMF-
79 0048g].

80 **RESPONSE:**

81 The response to CEC Rd 1 MMF-0009a requires clarification. It stated “no mitigation
82 measures directed at effects on resources as a result of increased access by resource
83 users created by the north and south access roads....are planned during operation”. It
84 should be clarified that operation phase effects on caribou have been reduced through
85 Project design. For example, access roads were routed to avoid caribou calving
86 complexes and to reduce loss of effective habitat. Mitigation involves measures
87 implemented in the construction phase (see 7.4.6.2.1 of the TE SV), the benefits of
88 which will carry over into the operations phase, as follows:

- 89 • Roadside ditches will be rehabilitated with native plants with low quality food value
90 for caribou, where practicable, to minimize attraction and the risk of collisions and
91 harvest opportunities; and
92 • Except for the existing resource-use trails (see Construction Access Management
93 Plan), Project-related cutlines and trails will be blocked where they intersect Zone 1
94 (Project Footprint including access roads) and the portions of these features within
95 100 m of Zone 1 will be re-vegetated to minimize the risk of habitat disturbance,
96 accidental fire and access-related effects.

97 *Will the outcome of discussions between the Partnership and MCWS be made available*
98 *to the MMF for comment?*

99 It is not clear which discussions the reviewer is referring to.

100 As noted in TAC Public Rd 2 EC-0032a, the Partnership will be providing environmental
101 protection plans, monitoring plans and management plans to the Province for review
102 and approval (most of the preliminary plans were provided as of June 28, 2013 and are
103 available on the Partnership’s website). These plans include mitigation and monitoring
104 measures for protection of wildlife. For example, the success of the re-vegetation efforts
105 will be monitored as part of the Terrestrial Effects Monitoring Plan and additional
106 efforts will be applied to areas not meeting objectives. Wildlife collisions will also be
107 monitored to determine if additional mitigation measures are required (e.g., speed limit
108 adjustments). The results of these programs will be reported on annually. Reports will
109 be filed with Manitoba Conservation and Water Stewardship and placed on the

110 Partnership's website at www.keeyask.com (see also CEC Rd 1 MMF-0012e, CEC Rd1
111 MMF-0016c).

112 *Has the impact assessment for caribou taken into consideration that there may not be*
113 *any mitigation measures directed at increased access by resource users during*
114 *operations?*

115 As noted in the clarification above, Project design (e.g., road routing) was adapted
116 specifically to avoid effects on caribou associated with the north and south access roads.
117 Mitigation measures implemented in the construction phase will apply to operation
118 phase effects. The impact assessment on caribou has considered these mitigation
119 measures.

120 Road routing, however, cannot entirely preclude the possibility that the highly variable
121 temporal and spatial occurrences of caribou may periodically coincide with the specific
122 areas of the north and south access roads (i.e., which constitute improved but not new
123 access). Any potential additional opportunistic domestic harvest that may occur in
124 relation to the improved access during operation, would incrementally add to the
125 harvest of coastal and barren-ground caribou. This potential effect on caribou
126 populations was taken into consideration in the impact assessment.

127 As noted in the original response to CEC Rd 1 MMF-0009a, the Partnership does not
128 have authority to manage the harvest of fish or wildlife populations in public areas.
129 Manitoba Conservation and Water Stewardship have the mandate to sustainably
130 manage use of fisheries and wildlife resources in these (and all) public areas which can
131 be accomplished through provincial harvest restrictions applicable to recreational
132 resource users. Caribou hunting, for example, is prohibited in the north and south
133 access road areas by recreational hunters. Each of the KCNs is working with Manitoba
134 Hydro (on behalf of the Partnership) to develop community-specific ATK monitoring
135 programs for the Project. It is expected that the ATK monitoring will involve the
136 development and implementation of annual monitoring programs based on
137 construction and/or operational activities and related community concerns about
138 potential effects (Section 8.2.7).

139 In recognition of these possibilities and the limitations of the Project with respect to
140 wildlife management, the Partnership has proposed a draft of the TEMP for monitoring
141 effects, and has broadened the scope of monitoring efforts to co-ordinate and manage
142 its facilities for caribou beyond Study Zone 6 (see CEC Rd 1 MMF-0014), where the
143 Partnership is willing to share information and to work with regulators in addressing all
144 issues. As described similarly for moose (see CEC Rd 2 MMF-0050), the Partnership,
145 remains committed to considering any additional information provided on the use of
146 lands and resources for traditional purposes by the Metis, and is willing to work with all

- 147 stakeholders in the best interests of managing Project effects to sustain our natural
148 resources such as caribou.
- 149 *Please refer to follow-up questions under CEC Rd 1 MMF-0009g below [MMF-0048g].*
- 150 Responses to these follow-up questions are provided in CEC Rd 2 MMF-0048g.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
 2 **Volume; Section: Sections 7.4.2.1.4, 7.4.6.2.1, 7.4.6.2.2, 7.4.6.2.3**
 3 **(TE SV); Section 6.5.8.1.1, 4.6.3, 6.5.8 (R to EIS); Section 3.3.2 (PD**
 4 **SV) ; Page No.: 7-90, 7-117, 7-121 to 7-124, Map 7-27 (TE SV); 6-**
 5 **371, 4-34, 6-367 (R to EIS); 3-14 (PD SV)**

6 **CEC Rd 2 MMF-0048b**

7 **ORIGINAL PREAMBLE AND QUESTION (MMF-0048b):**

8 EIS Scoping Document Reference: 5.1 Project Effects: “Measures to mitigate potential
 9 effects that are technically and economically feasible will be identified. Potential effects
 10 that remain after the application of mitigation measures will be considered to be
 11 potential residual effects;”

12 The Scoping Document (Section 5.1) sets out that measures to mitigate potential effects
 13 that are technically and economically feasible will be identified, but more specific details
 14 are required to understand how Project impacts might be managed. The EIS indicates a
 15 “high confidence” (TE-SV-7.0, Section 7.4.6.2.3, p. 7-124) in the ability to mitigate and
 16 manage potential Project effects on caribou, yet the EIS provides little detail on
 17 proposed mitigation measures and does not appear to have provided the details of
 18 some plans intended to outline mitigation measures. It is difficult, if not impossible, to
 19 understand residual Project effects (and conclusions regarding the magnitude, extent,
 20 duration, and direction of residual effects) without a complete understanding of the
 21 proposed mitigation measures and the effectiveness of those measures. Details of how
 22 mitigation success will be measured, including targets or definitions of success, are not
 23 provided. The following proposed mitigation measures require more information in
 24 order to have a better understanding of how Project impacts might be managed:

- 25 • “Use of the access roads by resources users will be addressed in the Construction
 26 Access Management Plan” (TE-SV-7.0, Section 7.4.6.2.1, p. 7-117). During
 27 operations, the EIS indicates that Project-related cutlines and trails will be blocked
 28 and portions re-vegetated (Section 7.4.6.2.2, p. 7-123). The Preliminary
 29 Construction Access Management Plan ([http://keyask.com/wp/wp-](http://keyask.com/wp/wp-content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-CD-version.pdf)
 30 [content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-](http://keyask.com/wp/wp-content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-CD-version.pdf)
 31 [CD-version.pdf](http://keyask.com/wp/wp-content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-CD-version.pdf)) indicates that Manitoba Infrastructure and Transportation (MIT) will
 32 assume responsibility for the north and south access roads (with permanent river
 33 crossing) once construction is completed. It is not clear if any further mitigation
 34 measures are proposed to manage increased access created by the upgraded and
 35 permanent north and south roads once construction is complete.

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 37 value for caribou where practicable, to minimize attraction and the risk of collisions
 38 and harvest opportunities” (TE-SV-7.0, Section 7.4.6.2.1, p. 7-118), but no
 39 description or list of the native plant species to be used is provided.
- 40 • First Nations indicated concerns about hindered access by wildlife due to debris
 41 accumulation on shorelines upon flooding. The EIS concluded a negligible to small
 42 effect on local caribou movement along shorelines due to implementation of the
 43 Forebay Clearing Plan and Waterways Management Plan (TE-SV-7.0, Section
 44 7.4.6.2.2, p. 7-121). A Reservoir Clearing Plan for the Keeyask Project
 45 (http://www.hydro.mb.ca/projects/keeyask/pdf/Schedule_11_1_090529.pdf) and a
 46 Waterways Management Program for the Keeyask Project
 47 (http://www.hydro.mb.ca/projects/keeyask/pdf/Schedule_11_2_090529.pdf) were
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 56 in place for blasting during other times caribou are present in the Keeyask region.
- 57 • “A plan is being developed to coordinate caribou mitigation and monitoring
 58 activities among MH’s northern developments, as well as with government
 59 authorities and existing caribou committees and management boards” (TE-SV-7.0,
 60 Section 7.4.6.2.2, p. 7-123). No timeframe was provided for when this plan could be
 61 available for review by affected parties.

62 Describe or list the native plant species to be used in roadside rehabilitation. Are these
 63 plant species a potential attractant for other species, such as moose?

64 **FOLLOW-UP QUESTION:**

65 Information request satisfied. A table listing plant species and their percentages in a
 66 recommended seed mix is provided.

67 **RESPONSE:**

68 No response required.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
 2 **Volume; Section: Sections 7.4.2.1.4, 7.4.6.2.1, 7.4.6.2.2, 7.4.6.2.3**
 3 **(TE SV); Section 6.5.8.1.1, 4.6.3, 6.5.8 (R to EIS); Section 3.3.2 (PD**
 4 **SV) ; Page No.: 7-90, 7-117, 7-121 to 7-124, Map 7-27 (TE SV); 6-**
 5 **371, 4-34, 6-367 (R to EIS); 3-14 (PD SV)**

6 **CEC Rd 2 MMF-0048c**

7 **ORIGINAL PREAMBLE AND QUESTION (MMF-0009c):**

8 EIS Scoping Document Reference: 5.1 Project Effects: “Measures to mitigate potential
 9 effects that are technically and economically feasible will be identified. Potential effects
 10 that remain after the application of mitigation measures will be considered to be
 11 potential residual effects;”

12 The Scoping Document (Section 5.1) sets out that measures to mitigate potential effects
 13 that are technically and economically feasible will be identified, but more specific details
 14 are required to understand how Project impacts might be managed. The EIS indicates a
 15 “high confidence” (TE-SV-7.0, Section 7.4.6.2.3, p. 7-124) in the ability to mitigate and
 16 manage potential Project effects on caribou, yet the EIS provides little detail on
 17 proposed mitigation measures and does not appear to have provided the details of
 18 some plans intended to outline mitigation measures. It is difficult, if not impossible, to
 19 understand residual Project effects (and conclusions regarding the magnitude, extent,
 20 duration, and direction of residual effects) without a complete understanding of the
 21 proposed mitigation measures and the effectiveness of those measures. Details of how
 22 mitigation success will be measured, including targets or definitions of success, are not
 23 provided. The following proposed mitigation measures require more information in
 24 order to have a better understanding of how Project impacts might be managed:

- 25 • “Use of the access roads by resources users will be addressed in the Construction
 26 Access Management Plan” (TE-SV-7.0, Section 7.4.6.2.1, p. 7-117). During
 27 operations, the EIS indicates that Project-related cutlines and trails will be blocked
 28 and portions re-vegetated (Section 7.4.6.2.2, p. 7-123). The Preliminary
 29 Construction Access Management Plan ([http://keeyask.com/wp/wp-](http://keeyask.com/wp/wp-content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-CD-version.pdf)
 30 [content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-](http://keeyask.com/wp/wp-content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-CD-version.pdf)
 31 [CD-version.pdf](http://keeyask.com/wp/wp-content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-CD-version.pdf)) indicates that Manitoba Infrastructure and Transportation (MIT) will
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 34 measures are proposed to manage increased access created by the upgraded and
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 38 and harvest opportunities” (TE-SV-7.0, Section 7.4.6.2.1, p. 7-118), but no
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 42 effect on local caribou movement along shorelines due to implementation of the
 43 Forebay Clearing Plan and Waterways Management Plan (TE-SV-7.0, Section
 44 7.4.6.2.2, p. 7-121). A Reservoir Clearing Plan for the Keeyask Project
 45 (http://www.hydro.mb.ca/projects/keeyask/pdf/Schedule_11_1_090529.pdf) and a
 46 Waterways Management Program for the Keeyask Project
 47 (http://www.hydro.mb.ca/projects/keeyask/pdf/Schedule_11_2_090529.pdf) were
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 51 converge on the site (TE-SV-7.0, Section 7.4.2.1.4, p. 7-90, Map 7-27). It is not clear
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 58 activities among MH’s northern developments, as well as with government
 59 authorities and existing caribou committees and management boards” (TE-SV-7.0,
 60 Section 7.4.6.2.2, p. 7-123). No timeframe was provided for when this plan could be
 61 available for review by affected parties.

62 Describe proposed mitigation measures to address impacts on local caribou movement
 63 due to debris accumulation on shorelines.

64 **FOLLOW-UP QUESTION:**

65 Will any debris accumulation along shorelines be managed by the Partnership after
 66 impoundment and during operation, if requested by affected groups?

67 **RESPONSE:**

68 As part of the Waterways Management Program (JKDA Schedule 11-2; Response to EIS
 69 Guidelines Appendix 4B), the areas in which debris is present or accumulating will be
 70 identified so that debris management activities may be prioritized to focus on areas
 71 more likely to cause debris that may move into the waterway and impede safe
 72 navigation.

73 It is anticipated that some debris will not need to be removed as some will subsequently
74 become immobilized or it may be located in areas where it is less likely to be moved into
75 the waterway and is not impeding travel routes. The main navigation routes and landing
76 sites, which will be identified as part of the Waterways Management Program, will be a
77 priority for debris removal.

78 The Waterways Management Program commits to a larger workforce in the early years
79 of operation when greater amounts of debris are anticipated to try ensuring that the
80 available resources will be able to fulfill the objectives of the Waterways Management
81 Program.

82 Affected groups can request debris removal in Keeyask waterways. Any such requests
83 would be evaluated, in light of the objectives of the Waterways Management Program,
84 and the requested debris removal work would be undertaken if required.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
 2 **Volume; Section: Sections 7.4.2.1.4, 7.4.6.2.1, 7.4.6.2.2, 7.4.6.2.3**
 3 **(TE SV); Section 6.5.8.1.1, 4.6.3, 6.5.8 (R to EIS); Section 3.3.2 (PD**
 4 **SV) ; Page No.: 7-90, 7-117, 7-121 to 7-124, Map 7-27 (TE SV); 6-**
 5 **371, 4-34, 6-367 (R to EIS); 3-14 (PD SV)**

6 **CEC Rd 2 MMF-0048d**

7 **ORIGINAL PREAMBLE AND QUESTION (MMF-0009d):**

8 EIS Scoping Document Reference: 5.1 Project Effects: “Measures to mitigate potential
 9 effects that are technically and economically feasible will be identified. Potential effects
 10 that remain after the application of mitigation measures will be considered to be
 11 potential residual effects;”

12 The Scoping Document (Section 5.1) sets out that measures to mitigate potential effects
 13 that are technically and economically feasible will be identified, but more specific details
 14 are required to understand how Project impacts might be managed. The EIS indicates a
 15 “high confidence” (TE-SV-7.0, Section 7.4.6.2.3, p. 7-124) in the ability to mitigate and
 16 manage potential Project effects on caribou, yet the EIS provides little detail on
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 47 (http://www.hydro.mb.ca/projects/keeyask/pdf/Schedule_11_2_090529.pdf) were
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 59 authorities and existing caribou committees and management boards” (TE-SV-7.0,
 60 Section 7.4.6.2.2, p. 7-123). No timeframe was provided for when this plan could be
 61 available for review by affected parties.

62 Describe the mitigation measures established to minimize impacts when the presence of
 63 caribou in the Keeyask region coincides with proposed reservoir clearing.

64 **FOLLOW-UP QUESTION:**

65 Given that there is the potential for caribou to be present in the LSA during reservoir
 66 clearing, plans to minimize impacts to caribou should be in place.

- 67 • Will clearing be delayed if caribou are present in the LSA or will other measures be
 68 used to displace caribou from the LSA?

69 **RESPONSE:**

70 The Partnership has no plans to delay reservoir clearing if caribou are present in the LSA.
 71 If caribou are present within the reservoir area at the time clearing is going to be

- 72 undertaken, Manitoba Conservation and Water Stewardship will be consulted for
73 advice.
- 74 There are no plans to use measures to displace caribou from the LSA.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
 2 **Volume, Response to EIS Guidelines, Project Description**
 3 **Supporting Volume; Section: Sections 7.4.2.1.4, 7.4.6.2.1, 7.4.6.2.2,**
 4 **7.4.6.2.3 (TE SV); Section 6.5.8.1.1, 4.6.3, 6.5.8 (R to EIS); Section**
 5 **3.3.2 (PD SV) ; Page No.: 7-90, 7-117, 7-121 to 7-124, Map 7-27 (TE**
 6 **SV); 6-371, 4-34, 6-367 (R to EIS); 3-14 (PD SV)**

7 **CEC Rd 2 MMF-0048e**

8 **ORIGINAL PREAMBLE AND QUESTION (MMF-0009e):**

9 EIS Scoping Document Reference: 5.1 Project Effects: “Measures to mitigate potential
 10 effects that are technically and economically feasible will be identified. Potential effects
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 30 Construction Access Management Plan ([http://keeyask.com/wp/wp-](http://keeyask.com/wp/wp-content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-CD-version.pdf)
 31 [content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-](http://keeyask.com/wp/wp-content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-CD-version.pdf)
 32 [CD-version.pdf](http://keeyask.com/wp/wp-content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-CD-version.pdf)) indicates that Manitoba Infrastructure and Transportation (MIT) will
 33 assume responsibility for the north and south access roads (with permanent river
 34 crossing) once construction is completed. It is not clear if any further mitigation
 35 measures are proposed to manage increased access created by the upgraded and
 36 permanent north and south roads once construction is complete.

- 37 • “Roadside ditches will be rehabilitated with native plants with low quality food
38 value for caribou where practicable, to minimize attraction and the risk of collisions
39 and harvest opportunities” (TE-SV-7.0, Section 7.4.6.2.1, p. 7-118), but no
40 description or list of the native plant species to be used is provided.
- 41 • First Nations indicated concerns about hindered access by wildlife due to debris
42 accumulation on shorelines upon flooding. The EIS concluded a negligible to small
43 effect on local caribou movement along shorelines due to implementation of the
44 Forebay Clearing Plan and Waterways Management Plan (TE-SV-7.0, Section
45 7.4.6.2.2, p. 7-121). A Reservoir Clearing Plan for the Keeyask Project
46 (http://www.hydro.mb.ca/projects/keeyask/pdf/Schedule_11_1_090529.pdf) and a
47 Waterways Management Program for the Keeyask Project
48 (http://www.hydro.mb.ca/projects/keeyask/pdf/Schedule_11_2_090529.pdf) were
49 found on-line. No measures specific to caribou (or wildlife) movement were
50 included within either report.
- 51 • The majority of reservoir clearing will be occurring in winter when caribou herds
52 converge on the site (TE-SV-7.0, Section 7.4.2.1.4, p. 7-90, Map 7-27). It is not clear
53 what mitigation measures are proposed to specifically address this scenario for
54 caribou.
- 55 • Blasting restrictions will be put in place with respect to caribou calving season
56 (Project Description SV, Section 3.3.2, p. 3-14), but it is not clear what mitigation is
57 in place for blasting during other times caribou are present in the Keeyask region.
- 58 • “A plan is being developed to coordinate caribou mitigation and monitoring
59 activities among MH’s northern developments, as well as with government
60 authorities and existing caribou committees and management boards” (TE-SV-7.0,
61 Section 7.4.6.2.2, p. 7-123). No timeframe was provided for when this plan could be
62 available for review by affected parties.

63 Indicate if blasting will occur while caribou are present in the Keeyask region. If so,
64 describe the mitigation measure established to minimize the impacts of blasting on
65 caribou.

66 **FOLLOW-UP QUESTION:**

67 The Partnership responds that “blasting will be minimized to the maximum extent
68 feasible from May 15 to June 30”.

- 69 • If caribou remain present beyond the undefined “maximum extent feasible”, are
70 any techniques planned to move caribou out of blasting zones?
- 71 • Please provide a threshold that defines the “maximum extent feasible”.
- 72 • Please provide the assessment of residual impacts of blasting that still occurs during
73 that time.

74 **RESPONSE:**

75 With active and on-going construction, caribou are not anticipated to occur in the
76 immediate areas designated for blasting activities. However, if caribou are present,
77 MCWS will be consulted for advice prior to blasting. As stated in the original response to
78 CEC Rd 1 MMF- 0009e, blasting will be minimized to the maximum extent feasible from
79 May 15 to June 30. The maximum extent feasible does not refer to a spatial extent away
80 from the blasting areas but rather it refers to minimizing blasting as much as possible
81 when it is feasible and practicable to do so. To the extent practical, the construction
82 schedule has been developed to avoid or reduce work activities during sensitive periods
83 for aquatic and wildlife species, as discussed in the Response to EIS Guidelines Chapter
84 6, Effects Assessment. It is prudent to note that some construction activities are
85 seasonally sensitive and delays of a few weeks during critical periods have the potential
86 to result in a loss of a year to the schedule (PDSV Section 3.1).

87 The residual effects assessment on caribou does not change. Study Zone 3 (TE SV Map 1-
88 1) was used to capture the spatial extent of sensory disturbances, including blasting
89 effects, which incorporates the loss of effective habitat. The response to CEC Rd 1 CEC-
90 0037c shows the loss of effective habitat. The effects of sensory disturbance on caribou
91 during construction can be found in Section 6.5.8.1.1 of the Response to EIS Guidelines.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
 2 **Volume; Section: Sections 7.4.2.1.4, 7.4.6.2.1, 7.4.6.2.2, 7.4.6.2.3**
 3 **(TE SV); Section 6.5.8.1.1, 4.6.3, 6.5.8 (R to EIS); Section 3.3.2 (PD**
 4 **SV) ; Page No.: 7-90, 7-117, 7-121 to 7-124, Map 7-27 (TE SV); 6-**
 5 **371, 4-34, 6-367 (R to EIS); 3-14 (PD SV)**

6 **CEC Rd 2 MMF-0048f**

7 **ORIGINAL PREAMBLE AND QUESTION (MMF-0009f):**

8 EIS Scoping Document Reference: 5.1 Project Effects: “Measures to mitigate potential
 9 effects that are technically and economically feasible will be identified. Potential effects
 10 that remain after the application of mitigation measures will be considered to be
 11 potential residual effects;”

12 The Scoping Document (Section 5.1) sets out that measures to mitigate potential effects
 13 that are technically and economically feasible will be identified, but more specific details
 14 are required to understand how Project impacts might be managed. The EIS indicates a
 15 “high confidence” (TE-SV-7.0, Section 7.4.6.2.3, p. 7-124) in the ability to mitigate and
 16 manage potential Project effects on caribou, yet the EIS provides little detail on
 17 proposed mitigation measures and does not appear to have provided the details of
 18 some plans intended to outline mitigation measures. It is difficult, if not impossible, to
 19 understand residual Project effects (and conclusions regarding the magnitude, extent,
 20 duration, and direction of residual effects) without a complete understanding of the
 21 proposed mitigation measures and the effectiveness of those measures. Details of how
 22 mitigation success will be measured, including targets or definitions of success, are not
 23 provided. The following proposed mitigation measures require more information in
 24 order to have a better understanding of how Project impacts might be managed:

- 25 • “Use of the access roads by resources users will be addressed in the Construction
 26 Access Management Plan” (TE-SV-7.0, Section 7.4.6.2.1, p. 7-117). During
 27 operations, the EIS indicates that Project-related cutlines and trails will be blocked
 28 and portions re-vegetated (Section 7.4.6.2.2, p. 7-123). The Preliminary
 29 Construction Access Management Plan ([http://keyask.com/wp/wp-](http://keyask.com/wp/wp-content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-CD-version.pdf)
 30 [content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-](http://keyask.com/wp/wp-content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-CD-version.pdf)
 31 [CD-version.pdf](http://keyask.com/wp/wp-content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-CD-version.pdf)) indicates that Manitoba Infrastructure and Transportation (MIT) will
 32 assume responsibility for the north and south access roads (with permanent river
 33 crossing) once construction is completed. It is not clear if any further mitigation
 34 measures are proposed to manage increased access created by the upgraded and
 35 permanent north and south roads once construction is complete.

- 36 • “Roadside ditches will be rehabilitated with native plants with low quality food
37 value for caribou where practicable, to minimize attraction and the risk of collisions
38 and harvest opportunities” (TE-SV-7.0, Section 7.4.6.2.1, p. 7-118), but no
39 description or list of the native plant species to be used is provided.
- 40 • First Nations indicated concerns about hindered access by wildlife due to debris
41 accumulation on shorelines upon flooding. The EIS concluded a negligible to small
42 effect on local caribou movement along shorelines due to implementation of the
43 Forebay Clearing Plan and Waterways Management Plan (TE-SV-7.0, Section
44 7.4.6.2.2, p. 7-121). A Reservoir Clearing Plan for the Keeyask Project
45 (http://www.hydro.mb.ca/projects/keeyask/pdf/Schedule_11_1_090529.pdf) and a
46 Waterways Management Program for the Keeyask Project
47 (http://www.hydro.mb.ca/projects/keeyask/pdf/Schedule_11_2_090529.pdf) were
48 found on-line. No measures specific to caribou (or wildlife) movement were
49 included within either report.
- 50 • The majority of reservoir clearing will be occurring in winter when caribou herds
51 converge on the site (TE-SV-7.0, Section 7.4.2.1.4, p. 7-90, Map 7-27). It is not clear
52 what mitigation measures are proposed to specifically address this scenario for
53 caribou.
- 54 • Blasting restrictions will be put in place with respect to caribou calving season
55 (Project Description SV, Section 3.3.2, p. 3-14), but it is not clear what mitigation is
56 in place for blasting during other times caribou are present in the Keeyask region.
- 57 • “A plan is being developed to coordinate caribou mitigation and monitoring
58 activities among MH’s northern developments, as well as with government
59 authorities and existing caribou committees and management boards” (TE-SV-7.0,
60 Section 7.4.6.2.2, p. 7-123). No timeframe was provided for when this plan could be
61 available for review by affected parties.

62 Indicate when the details of the plan for coordination of caribou mitigation and
63 monitoring activities will be available to the Métis for review.

64 **FOLLOW-UP QUESTION:**

- 65 • Please see follow-up questions from CEC Rd 1 MMF-0009g below regarding the
66 TEMP.
- 67 • Will the Partnership provide the Terrestrial Mitigation Implementation Plan for
68 review by the MMF once available?

69 **RESPONSE:**

70 *Please see follow-up questions from CEC Rd 1 MMF-0009g below regarding the TEMP.*

71 Please see response to this in MMF-0048g.

72 *Will the Partnership provide the Terrestrial Mitigation Implementation Plan for review by*
73 *the MMF once available?*

74 The Terrestrial Mitigation Implementation Plan will be developed once construction is
75 underway, and the actual extent of clearing and disturbance caused by construction of
76 the Keeyask Generation Project are known. This plan will be placed on the Partnership's
77 Web site once it is ready and will be included as part of the Project's Environmental
78 Protection Program. The Web site provides contact information, and questions and
79 comments from the public, including the MMF and its members, are welcome.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
 2 **Volume; Section: Sections 7.4.2.1.4, 7.4.6.2.1, 7.4.6.2.2, 7.4.6.2.3**
 3 **(TE SV); Section 6.5.8.1.1, 4.6.3, 6.5.8 (R to EIS); Section 3.3.2 (PD**
 4 **SV); Page No.: 7-90, 7-117, 7-121 to 7-124, Map 7-27 (TE SV); 6-**
 5 **371, 4-34, 6-367 (R to EIS); 3-14 (PD SV)**

6 **CEC Rd 2 MMF-0048g**

7 **ORIGINAL PREAMBLE AND QUESTION (MMF-0009g):**

8 EIS Scoping Document Reference: 5.1 Project Effects: “Measures to mitigate potential
 9 effects that are technically and economically feasible will be identified. Potential effects
 10 that remain after the application of mitigation measures will be considered to be
 11 potential residual effects;”

12 The Scoping Document (Section 5.1) sets out that measures to mitigate potential effects
 13 that are technically and economically feasible will be identified, but more specific details
 14 are required to understand how Project impacts might be managed. The EIS indicates a
 15 “high confidence” (TE-SV-7.0, Section 7.4.6.2.3, p. 7-124) in the ability to mitigate and
 16 manage potential Project effects on caribou, yet the EIS provides little detail on
 17 proposed mitigation measures and does not appear to have provided the details of
 18 some plans intended to outline mitigation measures. It is difficult, if not impossible, to
 19 understand residual Project effects (and conclusions regarding the magnitude, extent,
 20 duration, and direction of residual effects) without a complete understanding of the
 21 proposed mitigation measures and the effectiveness of those measures. Details of how
 22 mitigation success will be measured, including targets or definitions of success, are not
 23 provided. The following proposed mitigation measures require more information in
 24 order to have a better understanding of how Project impacts might be managed:

- 25 • “Use of the access roads by resources users will be addressed in the Construction
 26 Access Management Plan” (TE-SV-7.0, Section 7.4.6.2.1, p. 7-117). During
 27 operations, the EIS indicates that Project-related cutlines and trails will be blocked
 28 and portions re-vegetated (Section 7.4.6.2.2, p. 7-123). The Preliminary
 29 Construction Access Management Plan ([http://keeyask.com/wp/wp-](http://keeyask.com/wp/wp-content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-CD-version.pdf)
 30 [content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-](http://keeyask.com/wp/wp-content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-CD-version.pdf)
 31 [CD-version.pdf](http://keeyask.com/wp/wp-content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-CD-version.pdf)) indicates that Manitoba Infrastructure and Transportation (MIT) will
 32 assume responsibility for the north and south access roads (with permanent river
 33 crossing) once construction is completed. It is not clear if any further mitigation
 34 measures are proposed to manage increased access created by the upgraded and
 35 permanent north and south roads once construction is complete.

- 36 • “Roadside ditches will be rehabilitated with native plants with low quality food
 37 value for caribou where practicable, to minimize attraction and the risk of collisions
 38 and harvest opportunities” (TE-SV-7.0, Section 7.4.6.2.1, p. 7-118), but no
 39 description or list of the native plant species to be used is provided.
- 40 • First Nations indicated concerns about hindered access by wildlife due to debris
 41 accumulation on shorelines upon flooding. The EIS concluded a negligible to small
 42 effect on local caribou movement along shorelines due to implementation of the
 43 Forebay Clearing Plan and Waterways Management Plan (TE-SV-7.0, Section
 44 7.4.6.2.2, p. 7-121). A Reservoir Clearing Plan for the Keeyask Project
 45 (http://www.hydro.mb.ca/projects/keeyask/pdf/Schedule_11_1_090529.pdf) and a
 46 Waterways Management Program for the Keeyask Project
 47 (http://www.hydro.mb.ca/projects/keeyask/pdf/Schedule_11_2_090529.pdf) were
 48 found on-line. No measures specific to caribou (or wildlife) movement were
 49 included within either report.
- 50 • The majority of reservoir clearing will be occurring in winter when caribou herds
 51 converge on the site (TE-SV-7.0, Section 7.4.2.1.4, p. 7-90, Map 7-27). It is not clear
 52 what mitigation measures are proposed to specifically address this scenario for
 53 caribou.
- 54 • Blasting restrictions will be put in place with respect to caribou calving season
 55 (Project Description SV, Section 3.3.2, p. 3-14), but it is not clear what mitigation is
 56 in place for blasting during other times caribou are present in the Keeyask region.
- 57 • “A plan is being developed to coordinate caribou mitigation and monitoring
 58 activities among MH’s northern developments, as well as with government
 59 authorities and existing caribou committees and management boards” (TE-SV-7.0,
 60 Section 7.4.6.2.2, p. 7-123). No timeframe was provided for when this plan could be
 61 available for review by affected parties.

62 Indicate how the success of mitigation will be gauged.

63 **FOLLOW-UP QUESTION:**

64 The Partnership indicates that a preliminary draft TEMP was filed on June 28, 2013 and
 65 that “the TEMP describes the monitoring of caribou during operation to evaluate
 66 performance of mitigation measures.” As this plan has only recently been filed, we have
 67 some information requests specific to the plan: For the purposes of monitoring, pre-
 68 construction is defined “as the period between Project approval and the start of clearing
 69 activities for construction” (Preliminary TEMP, Section 1.3, p.1-6).

- 70 • Please indicate if construction activity for the Keeyask Infrastructure Project (KIP)
 71 has already begun or will be ongoing in any of the Keeyask study areas during the
 72 collection of pre-construction information for the Keeyask Project.

- 73 · Will monitoring activity in association with the north and south access roads
74 continue during operations (i.e., once responsibility has been transferred to
75 Manitoba Infrastructure and Transportation (MIT))? If so, who is responsible for
76 continued monitoring?

77 **RESPONSE:**

78 Construction activity for the Keeyask Infrastructure Project (KIP) began in January 2012.
79 KIP construction is scheduled to be completed in the spring of 2014 which is prior to the
80 anticipated issuance of licenses and authorizations for the Keeyask Generation Station
81 Project. Therefore, KIP will be completed prior to the pre-construction period defined in
82 the Terrestrial Effects Monitoring Plan (TEMP).

83 The Partnership has committed in the TEMP to operation monitoring associated with
84 study zones 1, 2, 3, 4, 5 and 6, as shown in section 8.0 of the TEMP. The north and
85 south access roads are included within these study zones.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
2 **Volume, Response to EIS Guidelines; Section: 7.4.6.3.1 (TE SV),**
3 **6.5.8.2.1 (R to EIS); p. 7-116, 6-378**

4 **CEC Rd 2 MMF-0049a**

5 **ORIGINAL PREAMBLE AND QUESTION (MMF-0010a):**

6 EIS Scoping Document Reference: 5.1 Project Effects: In reporting on the assessment of
7 potential environmental effects, the EIS will describe the approach and methods used to
8 identify and assess the effects, and it will also provide a record of assumptions and
9 analyses that support the conclusions.”

10 The Scoping Document (Section 5.1) sets out that assumptions and analyses that
11 support conclusions regarding Project effects will be described. More detail is required
12 to understand how conclusions about the Project impact on moose were reached. The
13 EIS concludes that sensory disturbance on moose in the LSA are expected to be
14 negligible to small. This conclusion is partially based on results on the Mammal
15 Monitoring Investigations for the Wuskwatim Generation Project Pre-construction and
16 Construction Report (2004-2009), but no data was provided.

17 The EIS also indicates that moose may avoid heavy traffic roads. The northern access
18 road appears to be within the largest concentration of primary moose habitat in the LSA
19 (R to EIS, Map 6-68) and will be the primary access during construction of the GS (TE-SV-
20 7.0, Section 7.4.6.2.1, p. 7-116). It is not clear if this was factored into the assessment
21 for the impact of sensory disturbance on moose.

22 Are the Mammal Monitoring Investigations for the Wuskwatim General Project available
23 for review by the Métis? If so, please provide.

24 **FOLLOW-UP QUESTION:**

25 Information request satisfied. The Partnership provided the Mammal Monitoring
26 Investigations for the Wuskwatim Generation Project Pre-construction and Construction
27 Report (2004-2009).

28 **RESPONSE:**

29 No response required.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
 2 **Volume, Response to EIS Guidelines; Section: 7.4.6.3.1 (TE SV),**
 3 **6.5.8.2.1 (R to EIS); p. 7-116, 6-378**

4 **CEC Rd 2 MMF-0049b**

5 **ORIGINAL PREAMBLE AND QUESTION (MMF-0010b):**

6 EIS Scoping Document Reference: 5.1 Project Effects: In reporting on the assessment of
 7 potential environmental effects, the EIS will describe the approach and methods used to
 8 identify and assess the effects, and it will also provide a record of assumptions and
 9 analyses that support the conclusions.”

10 The Scoping Document (Section 5.1) sets out that assumptions and analyses that
 11 support conclusions regarding Project effects will be described. More detail is required
 12 to understand how conclusions about the Project impact on moose were reached. The
 13 EIS concludes that sensory disturbance on moose in the LSA are expected to be
 14 negligible to small. This conclusion is partially based on results on the Mammal
 15 Monitoring Investigations for the Wuskwatim Generation Project Pre-construction and
 16 Construction Report (2004-2009), but no data was provided.

17 The EIS also indicates that moose may avoid heavy traffic roads. The northern access
 18 road appears to be within the largest concentration of primary moose habitat in the LSA
 19 (R to EIS, Map 6-68) and will be the primary access during construction of the GS (TE-SV-
 20 7.0, Section 7.4.6.2.1, p. 7-116). It is not clear if this was factored into the assessment
 21 for the impact of sensory disturbance on moose.

22 • Was the association between the high levels of use of north access road and primary
 23 moose habitat in the LSA factored into the assessment for the impact of sensory
 24 disturbance on moose during construction? If not, re-assess the loss of effective
 25 habitat in the LSA considering the north access road during construction or add
 26 further justification for the negligible to small impact of sensory disturbance on
 27 moose during construction considering this information.

28 **FOLLOW-UP QUESTION:**

29 Neumann et al (2013) suggests that moose may only select for habitat near roads during
 30 times when traffic volumes are generally lower. Therefore, periods of heavy road traffic
 31 could result in loss of effective habitat for moose (i.e., by avoidance of roads). Spatio-
 32 temporal patterns in moose movement in relation to roads was also found by Eldergard
 33 et al (2012). Moose moved closer to roads at night and closer to smaller roads, both
 34 movements due to lower traffic volumes. Moose have also been noted to present a
 35 seasonal response to roads. Moose crossed roads less frequently in the summer (Beyer

36 et al. 2013) and were found further from roads in the summer during periods of higher
37 food availability (Eldergard et al. 2012). Therefore, moose exhibit behavioural
38 adaptations to cope with roads and traffic and these adaptations can contribute to loss
39 of effective habitat, particularly if high quality habitat is located near roads, as in the
40 case of the Keeyask project. Monitoring programs will have to confirm impact
41 predictions for moose during construction. No further questions at this time.

42 **RESPONSE:**

43 No response required.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
 2 **Volume; Section: 7.3.6.4.3; p. 7-75**

3 **CEC Rd 2 MMF-0050**

4 **ORIGINAL PREAMBLE AND QUESTION (MMF-0011):**

5 EIS Scoping Document Reference: 5.1 Project Effects: "Measures to mitigate potential
 6 effects that are technically and economically feasible will be identified. Potential effects
 7 that remain after the application of mitigation measures will be considered to be
 8 potential residual effects;"

9 The Scoping Document (Section 5.1) sets out that measures to mitigate potential effects
 10 that are technically and economically feasible will be identified, but more specific details
 11 are required to understand how Project impacts might be managed. The EIS refers to
 12 AEA offsetting programs that will result in alternate harvesting opportunities in the
 13 SLRMA to offset loss of TR due to the Project and to disperse harvest pressure in the LSA
 14 (TE-SV-7.0, Section 7.4.6.3.2, p. 7-130).

15 No details are provided of precisely how AEA offsetting programs will disperse existing
 16 harvest pressure on moose. AEA offsetting programs mitigate impacts to First Nations
 17 Project partners by providing alternative harvesting opportunities. No reference was
 18 made to how other potential harvesters, such as Métis members, will be managed. The
 19 mean regional moose population is "extra low" according to aerial surveys conducted
 20 from 2002 to 2006 (mean 0.04 moose/km²; Table 7-26) and criteria provided in the EIS
 21 (Section 7.3.6.4.3, p. 7-75).

22 The EIS concluded that moose harvest in the SLRMA will not likely exceed sustainable
 23 limits based on an estimate of current moose harvest (<10% of regional population)
 24 sourced from the Moose Harvest Sustainability Plan (MHSP). This information is used to
 25 support a prediction of negligible or small effect of moose harvest on the regional
 26 moose population. However, it does not appear that the Moose Harvest Sustainability
 27 Plan has been finalized or released for review. Understanding the details of the
 28 approach to moose management is critical for understanding if and how Project impacts
 29 are appropriately and successfully mitigated, particularly given the extra low regional
 30 moose population.

- 31 · Provide the details of the components of the AEA offsetting program that function
 32 as mitigation for harvesting effects on moose. Do these programs give consideration
 33 to Métis harvest in the region? How will residual adverse effects on Métis be offset?
 34 · Provide the Moose Harvest Sustainability Plan or indicate when it will be available
 35 for review by the Métis.

36 **FOLLOW-UP QUESTION:**

37 The original IR asked about mitigation for the potential increase in harvesting pressure
 38 on moose (due to increased access), not mitigation of impacts on First Nations
 39 harvesting opportunities. The Partnership refers to the Resource Use Section 1.2.4.2 of
 40 SE SV for an answer to the IR. This section largely discusses how impacts to domestic
 41 hunting will be mitigated. However, within this section it states that “AEA Offsetting
 42 Programs are expected to reduce hunting and gathering pressures in existing resource
 43 use areas and redistribute KCNs’ domestic hunting and gathering activity over larger
 44 (regional) land bases” (p1-35). It appears that self-regulation of wildlife harvest by KCNs
 45 is a main component of the offsetting programs.

- 46 · How will this self-regulation mitigation be monitored? The Partnership indicates in
 47 their response that, at this time, they are “not aware of any Metis-specific concerns
 48 regarding moose harvest in the Resource Use Regional Study Area or the Moose
 49 Regional Study Areas”. The Partnership goes on to say that a Metis-specific
 50 Traditional Land Use and Knowledge Study, socio-economic impact assessment and
 51 historical narrative for the Keeyask region will be undertaken.
- 52 · Does the Partnership intend to revisit the impact assessment for moose if the
 53 Manitoba Metis impact assessment indicates moose harvest within the terrestrial
 54 Regional Study Area?
- 55 · Will the Metis have the opportunity to reconcile any desired mitigation measures
 56 with KCN-specific mitigation (e.g., self-regulation of wildlife harvest)? The MHSP is
 57 currently undergoing an internal review and approval process.
- 58 · Will the Partnership provide the final CNP Moose Harvest Sustainability Plan for
 59 review by the MMF once available?

60 **RESPONSE:**

61 A response to each of the questions stated above is provided below.

62 *How will this self-regulation mitigation be monitored?*

63 There are two types of Project-related monitoring that will capture the effects of the
 64 Project (direct and indirect) on moose populations:

- 65 · Monitoring Plans associated with the Partnership’s Environmental Protection
 66 Program, including the Terrestrial Effects Monitoring Plan (TEMP) and the Resource
 67 Use Monitoring Plan (RUMP), and
 68 · The CNP Moose Harvest Sustainability Plan (MHSP).

69 The TEMP will monitor the effects of the Project on moose populations within the
 70 Regional Study Area and, this would include, any effects that may be experienced as a
 71 result of the redistribution of harvest effort. The outcomes of TEMP monitoring will help

72 to inform the effects that may be experienced by resources users harvesting in the
 73 region. Similarly, monitoring will also be undertaken of resource use activities (especially
 74 licenced harvest activities) that will assist in understanding how harvest is contributing
 75 to the effects seen through TEMP monitoring.

76 The MHSP is being developed to assist CNP Program Manager's so that they have the
 77 tools to implement and monitor the Access Programs in a manner that promotes long-
 78 term sustainability of the moose population in the Split Lake Resource Management
 79 Area. The CNP have lived in this area for thousands of years and have demonstrated
 80 ongoing stewardship for the land and resources within this region. The outcomes of
 81 monitoring through the MHSP will inform community management of its offsetting
 82 programs, but will also be shared with the Split Lake Resource Management Board to
 83 help inform Board and provincial government decisions with respect to resources in the
 84 region.

85 Results of all monitoring activities will also be discussed and assessed at the
 86 Partnership's Monitoring Advisory Committee (MAC). Through this forum, all partners
 87 will be informed on the outcomes of moose population and harvest monitoring. As an
 88 advisory committee to the Partnership Board, MAC will oversee the monitoring and will
 89 make recommendations to address concerns, if they arise.

90 *Does the Partnership intend to revisit the impact assessment for moose if the Manitoba
 91 Metis impact assessment indicates moose harvest within the terrestrial Regional Study
 92 Area? Will the Metis have the opportunity to reconcile any desired mitigation measures
 93 with KCN-specific mitigation (e.g., self-regulation of wildlife harvest)?*

94 The Partnership remains committed to considering any additional information provided
 95 on the use of lands and resources for traditional purposes by the Metis. The Partnership
 96 is committed to ongoing dialogue with the MMF so that it can determine how best to
 97 incorporate this new information into planning and development processes for the
 98 Keeyask Generation Project, once it is available.

99 *The MHSP is currently undergoing an internal review and approval process. Will the
 100 Partnership provide the final CNP Moose Harvest Sustainability Plan for review by the
 101 MMF once available?*

102 As noted in CEC Rd 1 MMF-0011a, the MHSP contains monitoring and is currently
 103 undergoing an internal review and approval process involving TCN and WLFN members
 104 and Chiefs and Councils and was expected to be available in final form by August 1,
 105 2013. Once ready, the Plan will be presented to the Split Lake Resource Management
 106 Board (SLRMB) for review and discussion. This Plan has been developed specifically for
 107 use by CNP program managers responsible for implementation of the TCN and WLFN

108 Access Programs negotiated in each community's Adverse Effects Agreement. The
109 MHSP appendices have been released as part of the technical reports referenced in
110 Responses to Information Requests (CEC Round 1) available at:
111 [http://keeyask.com/wp/wp-content/uploads/2013/07/Moose-Harvest-Sustainability-](http://keeyask.com/wp/wp-content/uploads/2013/07/Moose-Harvest-Sustainability-Plan-Draft-18Jun2013-Extracted-Appendix.pdf)
112 [Plan-Draft-18Jun2013-Extracted-Appendix.pdf](http://keeyask.com/wp/wp-content/uploads/2013/07/Moose-Harvest-Sustainability-Plan-Draft-18Jun2013-Extracted-Appendix.pdf). Once the MHSP is finalized through
113 these community-approval process, the Plan will be made available to the public.

1 **REFERENCE: Volume: N/A; Section: N/A; Page No.: N/A**

2 **CEC Rd 2 MMF-0051a**

3 **ORIGINAL PREAMBLE AND QUESTION (MMF-0012a):**

4 "EIS Scoping Document Reference: 5.1 Project Effects: "Measures to mitigate potential
5 effects that are technically and economically feasible will be identified. Potential effects
6 that remain after the application of mitigation measures will be considered to be
7 potential residual effects;"

8 The Scoping Document (Section 5.1) sets out that measures to mitigate potential effects
9 that are technically and economically feasible will be identified, but more specific details
10 are required to understand how Project impacts might be managed.

11 The EIS indicates a "high confidence" (TE-SV-7.0, Section 7.4.6.3.3, p. 7-131) in the
12 ability to mitigate and manage potential Project effects on moose, yet the EIS provides
13 little detail on proposed mitigation measures and does not appear to have provided the
14 details of some plans intended to outline mitigation measures. It is difficult, if not
15 impossible, to understand residual Project effects (and conclusions regarding the
16 magnitude, extent, duration, and direction of residual effects) without a complete
17 understanding of the proposed mitigation measures and the effectiveness of those
18 measures. Details of how mitigation success will be measured, including targets or
19 definitions of success, are not provided.

20 The following proposed mitigation measures require more information in order to have
21 a better understanding of how Project impacts might be managed:

- 22 • "Use of the access roads by resource users will be addressed in the Construction
23 Access Management Plan" (TE-SV-7.0, Section 7.4.6.3.1, p. 7-127). During
24 operations, the EIS indicates that Project-related cutlines and trails will be blocked
25 and portions re-vegetated (Section 7.4.6.3.2, p. 7-130). The Preliminary
26 Construction Access Management Plan ([http://keeyask.com/wp/wp-
27 content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-
28 CD-version.pdf](http://keeyask.com/wp/wp-content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-CD-version.pdf)) indicates that Manitoba Infrastructure and Transportation (MIT) will
29 assume responsibility for the north and south access roads (with permanent river
30 crossing) once construction is completed. It is not clear if any further mitigation
31 measures are proposed to manage increased access created by the upgraded and
32 permanent north and south roads once construction is complete.
- 33 • The EIS indicated that access to the north and south roads will be restricted to
34 "designated resource harvesters only" (TE-SV-1.0, Section 1.5.1, p.1-31). There is no

35 definition of or explanation of how one becomes a “designated resource harvester”.
 36 It is not clear if this includes Métis members.

- 37 · The EIS makes reference to a Moose Harvest Sustainability Plan developed by TCN
 38 to guide the management of their Adverse Effects Agreement Access Program. This
 39 Plan apparently contains mitigation to ensure the sustainability of the moose
 40 population in the SLRMA. The MHSP appears to be a primary piece of mitigation for
 41 moose, yet we are not able to review the detailed information in this report and do
 42 not know when we will be able to review the report.
- 43 · “Roadside ditches will be rehabilitated with native plants with low quality food
 44 value for moose where practicable, to minimize attraction of moose to the road and
 45 the risk of wildlife-vehicle collisions and harvest opportunities” (TE-SV-7.0, Section
 46 7.4.6.3.1, p. 7-127), but no description or list of the native plant species to be used is
 47 provided.
- 48 · “Continue to communicate and coordinate with TCN Members to verify that
 49 recommendations in the moose harvest sustainability plan are being implemented”
 50 (TE-SV-7.0, Section 7.4.6.3.2, p. 7-130). There is no indication that any plans are in
 51 place to communicate with Métis members regarding Project impacts on moose.
- 52 · The EIS indicates that mitigation for wetland function will benefit moose (TE-SV-7.0,
 53 Section 7.4.6.3.2, p. 7-130). Map 2-22 (Project Description SV) and Map 4-10 (R to
 54 EIS, Section 4.0) show Mitigation Areas and, more specifically, the location of
 55 Potential High Quality Wetlands. The route for the Proposed South Access Road
 56 runs directly through the Potential High Quality Wetland. It seems likely that this
 57 interaction would result in moose adjacent to the road which would increase
 58 mortality risk from collisions and/or hunting. It is not clear if this interaction was
 59 taken into consideration.”

60 Indicate if there will be any ongoing mitigation of increased access by resource users,
 61 created by the upgraded and permanent north and south roads, upon completion of
 62 construction. If so, please describe.

63 **FOLLOW-UP QUESTION:**

64 The Partnership (in CEC Rd 1 MMF-0009a) indicates that no mitigation measures
 65 directed at effects of increased access by resource users are planned during operation
 66 and that this is within the mandate of MCWS. The Partnership intends to work with
 67 MCWS to monitor changes in moose licence demand and harvest locations. Based on
 68 the response, it is uncertain what mitigation measures might be in place for the north
 69 and south access roads during operations, if any, whether or not mitigation success will
 70 be measured, who is responsible for measuring it, and how it will be measured (no
 71 definitions or targets for mitigation success have been provided).

- 72 · Will the outcome of discussions between the Partnership and MCWS be made
73 available to the MMF for comment?
74 · Please refer to follow-up questions under CEC Rd 1 MMF-0009g [see CEC Rd2 MMF-
75 0048g].

76 **RESPONSE:**

77 The response to CEC Rd 1 MMF-0009a requires clarification. It stated “no mitigation
78 measures directed at effects on resources as a result of increased access by resource
79 users created by the north and south access roads....are planned during operation”.
80 Mitigation involves measures implemented in the construction phase (see 7.4.6.2.1 of
81 the TE SV) the benefits of which will carry over into the operations phase as follows:

- 82 · Roadside ditches will be rehabilitated with native plants with low quality food value
83 for moose, where practicable, to minimize attraction and the risk of collisions and
84 harvest opportunities;
85 · Except for the existing resource-use trails (see Construction Access Management
86 Plan), Project-related cutlines and trails will be blocked where they intersect Zone 1
87 (Project Footprint including access roads) and the portions of these features within
88 100 m of Zone 1 will be re-vegetated to minimize the risk of habitat disturbance,
89 accidental fire and access-related effects; and
90 · A moose harvest sustainability plan will be implemented by the CNP so that the
91 moose population will remain at a sustainable level in the SLRMA.

92 *Will the outcome of discussions between the Partnership and MCWS be made available*
93 *to the MMF for comment?*

94 Please see response provided in CEC Rd 2 MMF-0048a.

95 *Please refer to follow-up questions under CEC Rd 1 MMF-0009g [see CEC Rd2 MMF-*
96 *0048g].*

97 Responses to these follow-up questions are provided in CEC Rd 2 MMF-0048g.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
 2 **Volume; Section: N/A; Page No.: N/A**

3 **CEC Rd 2 MMF-0051b**

4 **ORIGINAL PREAMBLE AND QUESTION (MMF-0012b):**

5 "EIS Scoping Document Reference: 5.1 Project Effects: "Measures to mitigate potential
 6 effects that are technically and economically feasible will be identified. Potential effects
 7 that remain after the application of mitigation measures will be considered to be
 8 potential residual effects;"

9 The Scoping Document (Section 5.1) sets out that measures to mitigate potential effects
 10 that are technically and economically feasible will be identified, but more specific details
 11 are required to understand how Project impacts might be managed.

12 The EIS indicates a "high confidence" (TE-SV-7.0, Section 7.4.6.3.3, p. 7-131) in the
 13 ability to mitigate and manage potential Project effects on moose, yet the EIS provides
 14 little detail on proposed mitigation measures and does not appear to have provided the
 15 details of some plans intended to outline mitigation measures. It is difficult, if not
 16 impossible, to understand residual Project effects (and conclusions regarding the
 17 magnitude, extent, duration, and direction of residual effects) without a complete
 18 understanding of the proposed mitigation measures and the effectiveness of those
 19 measures. Details of how mitigation success will be measured, including targets or
 20 definitions of success, are not provided.

21 The following proposed mitigation measures require more information in order to have
 22 a better understanding of how Project impacts might be managed:

- 23 • "Use of the access roads by resources users will be addressed in the Construction
 24 Access Management Plan" (TE-SV-7.0, Section 7.4.6.3.1, p. 7-127). During
 25 operations, the EIS indicates that Project-related cutlines and trails will be blocked
 26 and portions re-vegetated (Section 7.4.6.3.2, p. 7-130). The Preliminary
 27 Construction Access Management Plan ([http://keeyask.com/wp/wp-](http://keeyask.com/wp/wp-content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-CD-version.pdf)
 28 [content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-](http://keeyask.com/wp/wp-content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-CD-version.pdf)
 29 [CD-version.pdf](http://keeyask.com/wp/wp-content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-CD-version.pdf)) indicates that Manitoba Infrastructure and Transportation (MIT) will
 30 assume responsibility for the north and south access roads (with permanent river
 31 crossing) once construction is completed. It is not clear if any further mitigation
 32 measures are proposed to manage increased access created by the upgraded and
 33 permanent north and south roads once construction is complete.
- 34 • The EIS indicated that access to the north and south roads will be restricted to
 35 "designated resource harvesters only" (TE-SV-1.0, Section 1.5.1, p.1-31). There is no

36 definition of or explanation of how one becomes a “designated resource harvester”.
 37 It is not clear if this includes Métis members.

- 38 · The EIS makes reference to a Moose Harvest Sustainability Plan developed by TCN
 39 to guide the management of their Adverse Effects Agreement Access Program. This
 40 Plan apparently contains mitigation to ensure the sustainability of the moose
 41 population in the SLRMA. The MHSP appears to be a primary piece of mitigation for
 42 moose, yet we are not able to review the detailed information in this report and do
 43 not know when we will be able to review the report.
- 44 · “Roadside ditches will be rehabilitated with native plants with low quality food
 45 value for moose where practicable, to minimize attraction of moose to the road and
 46 the risk of wildlife-vehicle collisions and harvest opportunities” (TE-SV-7.0, Section
 47 7.4.6.3.1, p. 7-127), but no description or list of the native plant species to be used is
 48 provided.
- 49 · “Continue to communicate and coordinate with TCN Members to verify that
 50 recommendations in the moose harvest sustainability plan are being implemented”
 51 (TE-SV-7.0, Section 7.4.6.3.2, p. 7-130). There is no indication that any plans are in
 52 place to communicate with Métis members regarding Project impacts on moose.
- 53 · The EIS indicates that mitigation for wetland function will benefit moose (TE-SV-7.0,
 54 Section 7.4.6.3.2, p. 7-130). Map 2-22 (Project Description SV) and Map 4-10 (R to
 55 EIS, Section 4.0) show Mitigation Areas and, more specifically, the location of
 56 Potential High Quality Wetlands. The route for the Proposed South Access Road
 57 runs directly through the Potential High Quality Wetland. It seems likely that this
 58 interaction would result in moose adjacent to the road which would increase
 59 mortality risk from collisions and/or hunting. It is not clear if this interaction was
 60 taken into consideration.”

61 Define and explain how one becomes a “designated resource harvester”. Does this
 62 designation include Métis members?

63 **FOLLOW-UP QUESTION:**

64 Information request satisfied. The opportunity to request access to the north and south
 65 roads is available to the Metis.

66 **RESPONSE:**

67 No response required.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
 2 **Volume; Section: N/A; Page No.: N/A**

3 **CEC Rd 2 MMF-0051c**

4 **ORIGINAL PREAMBLE AND QUESTION (MMF-0012c):**

5 "EIS Scoping Document Reference: 5.1 Project Effects: "Measures to mitigate potential
 6 effects that are technically and economically feasible will be identified. Potential effects
 7 that remain after the application of mitigation measures will be considered to be
 8 potential residual effects;"

9 The Scoping Document (Section 5.1) sets out that measures to mitigate potential effects
 10 that are technically and economically feasible will be identified, but more specific details
 11 are required to understand how Project impacts might be managed.

12 The EIS indicates a "high confidence" (TE-SV-7.0, Section 7.4.6.3.3, p. 7-131) in the
 13 ability to mitigate and manage potential Project effects on moose, yet the EIS provides
 14 little detail on proposed mitigation measures and does not appear to have provided the
 15 details of some plans intended to outline mitigation measures. It is difficult, if not
 16 impossible, to understand residual Project effects (and conclusions regarding the
 17 magnitude, extent, duration, and direction of residual effects) without a complete
 18 understanding of the proposed mitigation measures and the effectiveness of those
 19 measures. Details of how mitigation success will be measured, including targets or
 20 definitions of success, are not provided.

21 The following proposed mitigation measures require more information in order to have
 22 a better understanding of how Project impacts might be managed:

- 23 • "Use of the access roads by resources users will be addressed in the Construction
 24 Access Management Plan" (TE-SV-7.0, Section 7.4.6.3.1, p. 7-127). During
 25 operations, the EIS indicates that Project-related cutlines and trails will be blocked
 26 and portions re-vegetated (Section 7.4.6.3.2, p. 7-130). The Preliminary
 27 Construction Access Management Plan ([http://keeyask.com/wp/wp-](http://keeyask.com/wp/wp-content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-CD-version.pdf)
 28 [content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-](http://keeyask.com/wp/wp-content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-CD-version.pdf)
 29 [CD-version.pdf](http://keeyask.com/wp/wp-content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-CD-version.pdf)) indicates that Manitoba Infrastructure and Transportation (MIT) will
 30 assume responsibility for the north and south access roads (with permanent river
 31 crossing) once construction is completed. It is not clear if any further mitigation
 32 measures are proposed to manage increased access created by the upgraded and
 33 permanent north and south roads once construction is complete.
- 34 • The EIS indicated that access to the north and south roads will be restricted to
 35 "designated resource harvesters only" (TE-SV-1.0, Section 1.5.1, p.1-31). There is no

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- 38 · The EIS makes reference to a Moose Harvest Sustainability Plan developed by TCN
 39 to guide the management of their Adverse Effects Agreement Access Program. This
 40 Plan apparently contains mitigation to ensure the sustainability of the moose
 41 population in the SLRMA. The MHSP appears to be a primary piece of mitigation for
 42 moose, yet we are not able to review the detailed information in this report and do
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- 44 · “Roadside ditches will be rehabilitated with native plants with low quality food
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 47 7.4.6.3.1, p. 7-127), but no description or list of the native plant species to be used is
 48 provided.
- 49 · “Continue to communicate and coordinate with TCN Members to verify that
 50 recommendations in the moose harvest sustainability plan are being implemented”
 51 (TE-SV-7.0, Section 7.4.6.3.2, p. 7-130). There is no indication that any plans are in
 52 place to communicate with Métis members regarding Project impacts on moose.
- 53 · The EIS indicates that mitigation for wetland function will benefit moose (TE-SV-7.0,
 54 Section 7.4.6.3.2, p. 7-130). Map 2-22 (Project Description SV) and Map 4-10 (R to
 55 EIS, Section 4.0) show Mitigation Areas and, more specifically, the location of
 56 Potential High Quality Wetlands. The route for the Proposed South Access Road
 57 runs directly through the Potential High Quality Wetland. It seems likely that this
 58 interaction would result in moose adjacent to the road which would increase
 59 mortality risk from collisions and/or hunting. It is not clear if this interaction was
 60 taken into consideration.”

61 Describe the mitigation measures or plans that are in place to address Métis-specific
 62 concerns regarding moose harvest (the Moose Harvest Sustainability Plan seems to be
 63 First Nation specific, although this would need to be confirmed once it is available for
 64 review).

65 **FOLLOW-UP QUESTION:**

66 Please see follow-up questions under CEC Rd 1 MMF-0011a [CEC Rd 2 MMF-0050].

67 **RESPONSE:**

68 Please see the response to CEC Rd 2 MMF-0050.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
 2 **Volume; Section: N/A; Page No.: N/A**

3 **CEC Rd 2 MMF-0051d**

4 **ORIGINAL PREAMBLE AND QUESTION (MMF-0012d):**

5 "EIS Scoping Document Reference: 5.1 Project Effects: "Measures to mitigate potential
 6 effects that are technically and economically feasible will be identified. Potential effects
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9 The Scoping Document (Section 5.1) sets out that measures to mitigate potential effects
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 25 operations, the EIS indicates that Project-related cutlines and trails will be blocked
 26 and portions re-vegetated (Section 7.4.6.3.2, p. 7-130). The Preliminary
 27 Construction Access Management Plan ([http://keeyask.com/wp/wp-](http://keeyask.com/wp/wp-content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-CD-version.pdf)
 28 [content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-](http://keeyask.com/wp/wp-content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-CD-version.pdf)
 29 [CD-version.pdf](http://keeyask.com/wp/wp-content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-CD-version.pdf)) indicates that Manitoba Infrastructure and Transportation (MIT) will
 30 assume responsibility for the north and south access roads (with permanent river
 31 crossing) once construction is completed. It is not clear if any further mitigation
 32 measures are proposed to manage increased access created by the upgraded and
 33 permanent north and south roads once construction is complete.
- 34 • The EIS indicated that access to the north and south roads will be restricted to
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 40 Plan apparently contains mitigation to ensure the sustainability of the moose
 41 population in the SLRMA. The MHSP appears to be a primary piece of mitigation for
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 47 7.4.6.3.1, p. 7-127), but no description or list of the native plant species to be used is
 48 provided.
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 50 recommendations in the moose harvest sustainability plan are being implemented”
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 55 EIS, Section 4.0) show Mitigation Areas and, more specifically, the location of
 56 Potential High Quality Wetlands. The route for the Proposed South Access Road
 57 runs directly through the Potential High Quality Wetland. It seems likely that this
 58 interaction would result in moose adjacent to the road which would increase
 59 mortality risk from collisions and/or hunting. It is not clear if this interaction was
 60 taken into consideration.”

61 Describe or list the native plant species to be used in roadside rehabilitation. Are these
 62 plant species a potential attractant for other species, such as caribou?

63 **FOLLOW-UP QUESTION:**

64 Information request satisfied. A table listing plant species and their percentages in a
 65 recommended seed mix is provided.

66 **RESPONSE:**

67 No response required.

1 **REFERENCE: Volume: N/A; Section: N/A; Page No.: N/A**

2 **CEC Rd 2 MMF-0051e**

3 **ORIGINAL PREAMBLE AND QUESTION (MMF-0012e):**

4 "EIS Scoping Document Reference: 5.1 Project Effects: "Measures to mitigate potential
5 effects that are technically and economically feasible will be identified. Potential effects
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11 The EIS indicates a "high confidence" (TE-SV-7.0, Section 7.4.6.3.3, p. 7-131) in the
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26 Construction Access Management Plan ([http://keeyask.com/wp/wp-
27 content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-
28 CD-version.pdf](http://keeyask.com/wp/wp-content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-CD-version.pdf)) indicates that Manitoba Infrastructure and Transportation (MIT) will
29 assume responsibility for the north and south access roads (with permanent river
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 55 Potential High Quality Wetlands. The route for the Proposed South Access Road
 56 runs directly through the Potential High Quality Wetland. It seems likely that this
 57 interaction would result in moose adjacent to the road which would increase
 58 mortality risk from collisions and/or hunting. It is not clear if this interaction was
 59 taken into consideration.”

60 Are any plans proposed to communicate with the Métis community regarding moose
 61 harvest in Project area?

62 **FOLLOW-UP QUESTION:**

63 The Manitoba Metis will soon complete a Metis-specific Traditional Land Use and
 64 Knowledge Study, socio-economic impact assessment and historical narrative for the
 65 Keeyask region.

66 Will the Metis have the opportunity to contribute to the development of the TEMP?

67 Will the Metis be alerted to any activities relating to monitoring plan development,
 68 implementation, and reporting?

69 **RESPONSE:**

70 Please see the response to CEC Rd 2 MMF-0055b.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
 2 **Volume; Section: N/A; Page No.: N/A**

3 **CEC Rd 2 MMF-0051f**

4 **ORIGINAL PREAMBLE AND QUESTION (MMF-0051f):**

5 "EIS Scoping Document Reference: 5.1 Project Effects: "Measures to mitigate potential
 6 effects that are technically and economically feasible will be identified. Potential effects
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 20 definitions of success, are not provided.

21 The following proposed mitigation measures require more information in order to have
 22 a better understanding of how Project impacts might be managed:

- 23 • "Use of the access roads by resources users will be addressed in the Construction
 24 Access Management Plan" (TE-SV-7.0, Section 7.4.6.3.1, p. 7-127). During
 25 operations, the EIS indicates that Project-related cutlines and trails will be blocked
 26 and portions re-vegetated (Section 7.4.6.3.2, p. 7-130). The Preliminary
 27 Construction Access Management Plan ([http://keeyask.com/wp/wp-](http://keeyask.com/wp/wp-content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-CD-version.pdf)
 28 [content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-](http://keeyask.com/wp/wp-content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-CD-version.pdf)
 29 [CD-version.pdf](http://keeyask.com/wp/wp-content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-CD-version.pdf)) indicates that Manitoba Infrastructure and Transportation (MIT) will
 30 assume responsibility for the north and south access roads (with permanent river
 31 crossing) once construction is completed. It is not clear if any further mitigation
 32 measures are proposed to manage increased access created by the upgraded and
 33 permanent north and south roads once construction is complete.
- 34 • The EIS indicated that access to the north and south roads will be restricted to
 35 "designated resource harvesters only" (TE-SV-1.0, Section 1.5.1, p.1-31). There is no

36 definition of or explanation of how one becomes a “designated resource harvester”.
 37 It is not clear if this includes Métis members.

- 38 · The EIS makes reference to a Moose Harvest Sustainability Plan developed by TCN
 39 to guide the management of their Adverse Effects Agreement Access Program. This
 40 Plan apparently contains mitigation to ensure the sustainability of the moose
 41 population in the SLRMA. The MHSP appears to be a primary piece of mitigation for
 42 moose, yet we are not able to review the detailed information in this report and do
 43 not know when we will be able to review the report.
- 44 · “Roadside ditches will be rehabilitated with native plants with low quality food
 45 value for moose where practicable, to minimize attraction of moose to the road and
 46 the risk of wildlife-vehicle collisions and harvest opportunities” (TE-SV-7.0, Section
 47 7.4.6.3.1, p. 7-127), but no description or list of the native plant species to be used is
 48 provided.
- 49 · “Continue to communicate and coordinate with TCN Members to verify that
 50 recommendations in the moose harvest sustainability plan are being implemented”
 51 (TE-SV-7.0, Section 7.4.6.3.2, p. 7-130). There is no indication that any plans are in
 52 place to communicate with Métis members regarding Project impacts on moose.
- 53 · The EIS indicates that mitigation for wetland function will benefit moose (TE-SV-7.0,
 54 Section 7.4.6.3.2, p. 7-130). Map 2-22 (Project Description SV) and Map 4-10 (R to
 55 EIS, Section 4.0) show Mitigation Areas and, more specifically, the location of
 56 Potential High Quality Wetlands. The route for the Proposed South Access Road
 57 runs directly through the Potential High Quality Wetland. It seems likely that this
 58 interaction would result in moose adjacent to the road which would increase
 59 mortality risk from collisions and/or hunting. It is not clear if this interaction was
 60 taken into consideration.”

61 Indicate if and explain how the interaction between proposed potential high quality
 62 wetlands and the south access road was factored into the impact assessment.

63 **FOLLOW-UP QUESTION:**

64 The partnership concludes that a minimum 100 m buffer on either side of the road will
 65 result in an unsubstantial increase in the risk of moose-vehicle collisions. Please provide
 66 any data or literature that would support this conclusion, particularly given that the
 67 wetland continues on either side of the road and may encourage crossings by moose.

68 **RESPONSE:**

69 There is no literature that specifies that a 100 m buffer on either side of the road is
 70 required to reduce the risk of moose-vehicle collisions. Speed limits based on design
 71 criteria engineered to safely operate machinery and vehicles on access roads and
 72 temporary haul trails will reduce the risk of wildlife-vehicle collisions (see the response
 73 to CEC Rd 1 CEC-0037c).

74 The original information request (CEC Rd 1b MMF-0012f) suggested that the south
 75 access road running through the potential high quality wetland would result in moose
 76 adjacent to the road which would increase mortality risk from collisions, and wondered
 77 if this interaction was taken into consideration. The original response suggested that
 78 because the proposed mitigation areas would not be next to the road, the risk of
 79 moose-vehicle collisions would not be expected to increase substantially. This was
 80 based on literature that suggests that the lack of suitable forage near roads influences
 81 moose activity, not the width of the buffer zone.

82 In northern Manitoba, no collisions with moose were reported during construction of
 83 the Wuskwatim Generating Station. Manitoba Public Insurance statistics from 2008 to
 84 2012 reported 217 claims of wildlife-vehicle collisions around Thompson. Over this five-
 85 year period, two moose collisions were reported in 2010 and 1 was reported in 2012
 86 (Manitoba Public Insurance unpubl. data). These data are limited by what claimants
 87 reported (i.e., species may not have been specified in each case) and are affected by
 88 people's ability to correctly identify wildlife species.

89 Individual behaviour is an important determinant in whether or not moose cross roads
 90 (Neumann et al. 2012). Some moose will cross the access roads and others will avoid
 91 them, as suggested in CEC Rd 2 MMF-0049b. Collisions between moose and vehicles do
 92 occur in northern Manitoba, but are relatively rare and are not likely to increase
 93 substantially due to the Project, including in the proximity of the created off-system
 94 marsh. Increased risk of collisions with vehicles may affect a few individuals whose
 95 home ranges overlap the access roads, but will not affect the population in the Regional
 96 Study Area (Study Zone 5).

97 **REFERENCES:**

98 Neumann, W., G. Erricsson, H. Dettki, N. Bunnefeld, N.S. Keuler, D.P. Helmers, and V.C.
 99 Radeloff. 2012. Difference in spatiotemporal patterns of wildlife road-crossings
 100 and wildlife-vehicle collisions. *Biological Conservation* 145: 70-78.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
 2 **Volume; Section: Sections 7.4.2.1.4, 7.4.6.2.1, 7.4.6.2.2, 7.4.6.2.3**
 3 **(TE SV); Section 6.5.8.1.1, 4.6.3, 6.5.8 (R to EIS); Section 3.3.2 (PD**
 4 **SV) ; Page No.: 7-90, 7-117, 7-121 to 7-124, Map 7-27 (TE SV); 6-**
 5 **371, 4-34, 6-367 (R to EIS); 3-14 (PD SV)**

6 **CEC Rd 2 MMF-0051g**

7 **ORIGINAL PREAMBLE AND QUESTION (MMF-0012g):**

8 EIS Scoping Document Reference: 5.1 Project Effects: “Measures to mitigate potential
 9 effects that are technically and economically feasible will be identified. Potential effects
 10 that remain after the application of mitigation measures will be considered to be
 11 potential residual effects;”

12 The Scoping Document (Section 5.1) sets out that measures to mitigate potential effects
 13 that are technically and economically feasible will be identified, but more specific details
 14 are required to understand how Project impacts might be managed. The EIS indicates a
 15 “high confidence” (TE-SV-7.0, Section 7.4.6.3.3, p. 7-131) in the ability to mitigate and
 16 manage potential Project effects on moose, yet the EIS provides little detail on proposed
 17 mitigation measures and does not appear to have provided the details of some plans
 18 intended to outline mitigation measures. It is difficult, if not impossible, to understand
 19 residual Project effects (and conclusions regarding the magnitude, extent, duration, and
 20 direction of residual effects) without a complete understanding of the proposed
 21 mitigation measures and the effectiveness of those measures. Details of how mitigation
 22 success will be measured, including targets or definitions of success, are not provided.

23 The following proposed mitigation measures require more information in order to have
 24 a better understanding of how Project impacts might be managed:

- 25 • *“Use of the access roads by resources users will be addressed in the Construction*
 26 *Access Management Plan”* (TE-SV-7.0, Section 7.4.6.3.1, p. 7-127). During
 27 operations, the EIS indicates that Project-related cutlines and trails will be blocked
 28 and portions re-vegetated (Section 7.4.6.3.2, p. 7-130). The Preliminary
 29 Construction Access Management Plan ([http://keeyask.com/wp/wp-](http://keeyask.com/wp/wp-content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-CD-version.pdf)
 30 [content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-](http://keeyask.com/wp/wp-content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-CD-version.pdf)
 31 [CD-version.pdf](http://keeyask.com/wp/wp-content/uploads/2013/04/05-Preliminary-Construction-Access-Management-Plan-CD-version.pdf)) indicates that Manitoba Infrastructure and Transportation (MIT) will
 32 assume responsibility for the north and south access roads (with permanent river
 33 crossing) once construction is completed. It is not clear if any further mitigation
 34 measures are proposed to manage increased access created by the upgraded and
 35 permanent north and south roads once construction is complete.

- 36 · The EIS indicated that access to the north and south roads will be restricted to
 37 “designated resource harvesters only” (TE-SV-1.0, Section 1.5.1, p.1-31). There is no
 38 definition of or explanation of how one becomes a “designated resource harvester”.
 39 It is not clear if this includes Métis members.
- 40 · The EIS makes reference to a Moose Harvest Sustainability Plan developed by TCN
 41 to guide the management of their Adverse Effects Agreement Access Program. This
 42 Plan apparently contains mitigation to ensure the sustainability of the moose
 43 population in the SLRMA. The MHSP appears to be a primary piece of mitigation for
 44 moose, yet we are not able to review the detailed information in this report and do
 45 not know when we will be able to review the report.
- 46 · *“Roadside ditches will be rehabilitated with native plants with low quality food value
 47 for moose where practicable, to minimize attraction of moose to the road and the
 48 risk of wildlife-vehicle collisions and harvest opportunities”* (TE-SV-7.0, Section
 49 7.4.6.3.1, p. 7-127), but no description or list of the native plant species to be used is
 50 provided.
- 51 · *“Continue to communicate and coordinate with TCN Members to verify that
 52 recommendations in the moose harvest sustainability plan are being implemented”*
 53 (TE-SV-7.0, Section 7.4.6.3.2, p. 7-130). There is no indication that any plans are in
 54 place to communicate with Métis members regarding Project impacts on moose.
- 55 · The EIS indicates that mitigation for wetland function will benefit moose (TE-SV-7.0,
 56 Section 7.4.6.3.2, p. 7-130). Map 2-22 (Project Description SV) and Map 4-10 (R to
 57 EIS, Section 4.0) show Mitigation Areas and, more specifically, the location of
 58 Potential High Quality Wetlands. The route for the Proposed South Access Road
 59 runs directly through the Potential High Quality Wetland. It seems likely that this
 60 interaction would result in moose adjacent to the road which would increase
 61 mortality risk from collisions and/or hunting. It is not clear if this interaction was
 62 taken into consideration.

63 Indicate how the success of mitigation will be gauged.

64 **FOLLOW-UP QUESTION:**

65 The Partnership indicates that a preliminary draft TEMP was filed on June 28, 2013 and
 66 that “the success of mitigation specific to moose will be gauged via the results of moose
 67 monitoring outlined in the TEMP”. As this plan has only recently been filed, we have
 68 some information requests specific to the plan.

- 69 · Please see follow-up questions under CEC Rd 1 MMF-0009g [CEC Rd 2 MMF-0048g].

70 **RESPONSE:**

71 Refer to CEC Rd 2 MMF 0048g for responses to specific questions on the TEMP.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 8.1.3**
 2 **Adaptive Management; Page No.: 8-7**

3 **CEC Rd 2 MMF-0052**

4 **ORIGINAL PREAMBLE AND QUESTION (MMF-0013a):**

5 EIS Scoping Document Reference: 7.0 Environmental Monitoring, Management and
 6 Follow-up:: "The monitoring programs will determine effects of the Project....To address
 7 relevant issues and concerns identified by KCN, other Aboriginal groups and other
 8 stakeholders; and To identify the role of KCN in implementing the plans."

9 The EIS outlines numerous potential adaptive management measures for a range of
 10 VECs. However, there is no discussion of "action thresholds" or adaptive management
 11 triggers. Such triggers are necessary for understanding when to invoke the outlined
 12 adaptive management measures, or for modifying planned mitigation measures that are
 13 unsuccessful (CEAA 2009).

- 14 • Provide adaptive management triggers for all VECs considered in CEA, especially for
 15 those where the assessment is most uncertain.
 16 • Provide a table of adaptive management thresholds and triggers for VECs as a
 17 reference tool for use in follow-up and monitoring programs.
 18 • Provide potential management actions that would be triggered if thresholds are
 19 surpassed.

20 **FOLLOW-UP QUESTION:**

21 While we appreciate that flexibility is a key element of adaptive management in order to
 22 address uncertainty, so is the identification of Action Thresholds (CEAA, 2009), at least
 23 for those cases where sound baseline data exists to reduce uncertainty about impact
 24 assessments or the effectiveness of mitigation. No table of quantitative adaptive
 25 management thresholds and triggers for VECs that could be used as a reference tool for
 26 use in follow-up and monitoring programs was provided, as asked in the original IR.

- 27 • How does the Partnership intend to satisfy CEAA policy which requires that adaptive
 28 management thresholds are determined?
 29 • Will the MMF have the opportunity to be involved in the development of adaptive
 30 management thresholds?

31 **RESPONSE:**

32 The response to CEC Rd 1 MMF-0013 outlined how the term "adaptive management" is
 33 used in the EIS.

34 The Partnership's approach to adaptive management generally follows the referenced
35 2009 Canadian Environmental Assessment Agency Operational Policy Statement on
36 Adaptive Management Measures under the *Canadian Environmental Assessment Act*.
37 The policy does not appear to *require* that adaptive management thresholds are
38 determined. The Section on Identification of Action Thresholds says "Predetermined
39 action thresholds *can* [italicized for emphasis] be used to indicate when environmental
40 performance is below an acceptable level and requires corrective management action.
41 In such cases, adaptive management measures may be required to prevent significant
42 adverse environmental effects." In their Example 1, they note that "The decisions to
43 adapt the plan or trigger new or modified mitigation measures were to be based on
44 multiple lines of evidence indicating negative trends."

45 The Partnership recognizes that adaptive management is an important tool to deal with
46 uncertainties in predictions of effects, but as noted in the previous response in many
47 cases it is not feasible to define specific measures at this time and alternate approaches
48 were developed. Variations in predicted and actual results identified through
49 monitoring will be assessed by the Partnership and regulatory authorities for follow up
50 actions such as mitigation adjustments and adaptive management.

51 The Partnership is responsible for developing and implementing monitoring and follow-
52 up programs. At this time, the Partnership does not anticipate any role for the Manitoba
53 Metis Federation (MMF) in the development of adaptive management thresholds
54 associated with these programs. A description of any adaptive management
55 thresholds/measures developed will be reported as part of the process of ongoing
56 monitoring and reporting to regulators and will be posted for viewing by the public,
57 including the MMF and its members, on the Partnership's Website. The Website
58 provides contact information, and questions and comments from the public, including
59 the MMF, its members and other Metis citizens, are always welcome.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 8.3.2;**
2 **p. 8-23, 8-24**

3 **CEC Rd 2 MMF-0053**

4 **ORIGINAL PREAMBLE AND QUESTION (MMF-0014):**

5 EIS Scoping Document Reference: 7.0 Environmental Monitoring, Management and
6 follow-up: "The EIS will describe a preliminary outline of an environmental protection
7 program for monitoring and managing the effects of the Project on the biophysical and
8 socio-economic environments arising from the construction, operation, and
9 decommissioning of the Project".

10 The EIS states that monitoring of caribou and moose VECs will occur "Regularly during
11 construction and continuing for up to 30 years of operation, depending on results." (R to
12 EIS, Section 8.2.3, Table 8-4, p. 8-23). Given the open ended lifespan of the Project,
13 where hydroelectric generating stations can operate for a century or more, limiting the
14 temporal scope of the monitoring program may cause important cumulative effects to
15 be overlooked.

16 Provide an explanation for limiting the temporal scope of caribou and moose monitoring
17 programs to 30 years post-construction given an expected lifespan of the Project of 100
18 years or more and the potential for cumulative effects resulting from the high level of
19 development and disturbance already occurring and expected to increase in the region
20 over the life of this Project.

21 **FOLLOW-UP QUESTION:**

22 Information request satisfied. There is the opportunity for monitoring to be extended
23 should monitoring show deviations from benchmarks or uncertainties related to these
24 effects.

25 **RESPONSE:**

26 No response required.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: N/A;**
2 **Page No.: N/A**

3 **CEC Rd 2 MMF-0054**

4 **ORIGINAL PREAMBLE AND QUESTION (MMF-0015):**

5 EIS Scoping Document Reference: 7.0 Environmental Monitoring, Management and
6 follow-up: "The EIS will describe a preliminary outline of an environmental protection
7 program for monitoring and managing the effects of the Project on the biophysical and
8 socio-economic environments arising from the construction, operation, and
9 decommissioning of the Project".

10 The EIS states that monitoring of predators will occur annually during construction, and
11 then every 5 years, for only 30 years, during operations. Given the natural variability in
12 population dynamics of potential prey species (e.g. caribou and moose), and the
13 cumulative effects already impacting prey species, it would seem finer temporal scale
14 data, over a longer period would be necessary to separate potential causal factors (e.g.
15 density independent or dependent factors from anthropogenic factors) for prey species
16 declines.

17 **QUESTION:**

18 Information request satisfied. There is the opportunity for monitoring to be extended
19 should monitoring show deviations from benchmarks or uncertainties related to these
20 effects.

21 **RESPONSE:**

22 No response required.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
 2 **Volume; Section: 7.4.1.0; p. 7-152**

3 **CEC Rd 2 MMF-0055a**

4 **ORIGINAL PREAMBLE AND QUESTION (MMF-0016a):**

5 EIS Scoping Document Reference: 7.0 Environmental Monitoring, Management and
 6 Follow-up: "The monitoring programs will determine effects of the Project....To address
 7 relevant issues and concerns identified by KCN, other Aboriginal groups and other
 8 stakeholders; and To identify the role of KCN in implementing the plans."

9 The Scoping Document (Section 7.0) sets out that monitoring programs will address
 10 relevant issues and concerns identified by KCN, other aboriginal groups and other
 11 stakeholders. Unfortunately, neither the Scoping Document nor the EIS describe how
 12 relevant issues and concerns will be identified nor how Métis members will be involved.

13 The EIS states that "Monitoring is outlined for situations where the ATK and technical
 14 assessments differ, where a prediction has substantial uncertainty or a difference
 15 between predicted and actual residual effects could substantially alter the effects
 16 assessment." (TE-SV-7.0, Section 7.4.10, p. 7-152; R to EIS, Section 5.3.2.1, p. 5-7).

17 It is not clear how it would be determined that there is a potential for "substantial"
 18 alteration to the effects assessment. The EIS contains extensive discussion of the role
 19 the Keeyask Cree Nations (KCNs) will play in the monitoring and follow-up programs for
 20 the Project, including participation in their development and implementation which
 21 "will facilitate capacity building by providing employment and training opportunities" (R
 22 to EIS, Section 8.2.7, p. 8-39) for their members. The EIS also discusses plans to facilitate
 23 communications with KCN communities through forums such as open houses to keep
 24 "community Members updated on Project activities, adverse effects, and proposed
 25 mitigation strategies." (R to EIS, Section 8.2.7, p. 8-39). No mention is made in the EIS if
 26 these same opportunities for participation and capacity building will be extended to
 27 Manitoba Métis Federation members."

28 Explain how it is determined that there could be a substantial alteration to the effects
 29 assessment such that monitoring would be implemented.

30 **FOLLOW-UP QUESTION:**

31 The Partnership did not explain how it is determined that there could be a "substantial"
 32 alteration to the effects assessment since they did not provide a list of quantitative
 33 adaptive management thresholds as was asked in the original IR CEC Rd 1 MMF-0013.

34 **RESPONSE:**

35 As indicated in the response to CEC Rd 2 MMF-0052, variations in predicted and actual
36 results identified through monitoring will be assessed by the Partnership and regulatory
37 authorities for follow up actions such as mitigation adjustments and adaptive
38 management. The amount of alteration considered sufficient to warrant adaptive
39 management will be evaluated on a case-by-case basis. In some instances, specific
40 thresholds exist (e.g., water quality guidelines), but some decisions will be based on
41 regular reporting of monitoring results and discussions with regulators.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
 2 **Volume; Section: 7.4.1.0; p. 7-152**

3 **CEC Rd 2 MMF-0055b**

4 **ORIGINAL PREAMBLE AND QUESTION (MMF-0016b):**

5 EIS Scoping Document Reference: 7.0 Environmental Monitoring, Management and
 6 Follow-up: "The monitoring programs will determine effects of the Project....To address
 7 relevant issues and concerns identified by KCN, other Aboriginal groups and other
 8 stakeholders; and To identify the role of KCN in implementing the plans."

9 The Scoping Document (Section 7.0) sets out that monitoring programs will address
 10 relevant issues and concerns identified by KCN, other aboriginal groups and other
 11 stakeholders. Unfortunately, neither the Scoping Document nor the EIS describe how
 12 relevant issues and concerns will be identified nor how Métis members will be involved.

13 The EIS states that "Monitoring is outlined for situations where the ATK and technical
 14 assessments differ, where a prediction has substantial uncertainty or a difference
 15 between predicted and actual residual effects could substantially alter the effects
 16 assessment." (TE-SV-7.0, Section 7.4.10, p. 7-152; R to EIS, Section 5.3.2.1, p. 5-7).

17 It is not clear how it would be determined that there is a potential for "substantial"
 18 alteration to the effects assessment. The EIS contains extensive discussion of the role
 19 the Keeyask Cree Nations (KCNs) will play in the monitoring and follow-up programs for
 20 the Project, including participation in their development and implementation which
 21 "will facilitate capacity building by providing employment and training opportunities" (R
 22 to EIS, Section 8.2.7, p. 8-39) for their members. The EIS also discusses plans to facilitate
 23 communications with KCN communities through forums such as open houses to keep
 24 "community Members updated on Project activities, adverse effects, and proposed
 25 mitigation strategies." (R to EIS, Section 8.2.7, p. 8-39). No mention is made in the EIS if
 26 these same opportunities for participation and capacity building will be extended to
 27 Manitoba Métis Federation members."

28 Will Manitoba Métis Federation members be invited to participate in the development
 29 and implementation of monitoring and follow-up programs related to the Project? If
 30 yes, explain to what extent the Métis will be involved. If no, explain why the Métis will
 31 not be involved.

32 **FOLLOW-UP QUESTION:**

33 The Partnership did not indicate if MMF members will be invited to participate in the
 34 development and implementation of monitoring and follow-up programs related to the

35 Project, nor was the extent of potential Métis involvement described, as requested in
36 the original IR. No further questions at this time.

37 **RESPONSE:**

38 Although there are no further questions, the Partnership wishes to elaborate on its
39 initial response based on the comments provided in the Follow-up Question.

40 It is noted in the original response to CEC Rd 1 MMF-0016b that the Partnership is
41 responsible for developing and implementing monitoring and follow-up programs. A
42 draft version of the Environmental Protection Program has already been developed by
43 the Partnership and filed with regulators. At this time, the Partnership does not
44 anticipate any role for the Manitoba Metis Federation (MMF) in the development or
45 implementation of these programs.

46 The Partnership would welcome feedback from the MMF and its members or other
47 Metis persons on the Environmental Protection Program either directly or through the
48 federal and provincial review processes. The Partnership also remains open to meeting
49 with the MMF and its members and other Metis citizens through the Public Involvement
50 Program and feedback on the monitoring and follow-up programs could be provided
51 through this process. Although the Public Involvement Program is, for the most part,
52 complete, the Partnership has consistently indicated a willingness to meet at anytime as
53 part of this process if there is an interest.

54 As noted in the response to CEC Rd 1 MMF-0016c, Keeyask monitoring reports will be
55 available on the Partnership's Website. The Website provides contact information, and
56 questions and comments from the public, including the MMF and its members, are
57 always welcome as the monitoring and follow-up programs are implemented.

58 The Manitoba Métis Federation and Manitoba Hydro (acting on behalf of the
59 Partnership) have reached agreement on a workplan and budget to undertake a Metis-
60 specific Traditional Land Use and Knowledge Study, Socio-economic Impact Assessment
61 for Keeyask and historical narratives on Metis use and occupancy in northern Manitoba
62 and in the Keeyask region specifically. The Partnership will discuss the outcomes of
63 these studies with the MMF and consider this information as the Partnership finalizes its
64 monitoring and follow-up program.

1 **REFERENCE: Volume: N/A; Section: N/A; Page No.: N/A**

2 **CEC Rd 2 MMF-0055c**

3 **ORIGINAL PREAMBLE AND QUESTION (MMF-0016c):**

4 EIS Scoping Document Reference: 7.0 Environmental Monitoring, Management and
5 Follow-up: "The monitoring programs will determine effects of the Project....To address
6 relevant issues and concerns identified by KCN, other Aboriginal groups and other
7 stakeholders; and To identify the role of KCN in implementing the plans."

8 The Scoping Document (Section 7.0) sets out that monitoring programs will address
9 relevant issues and concerns identified by KCN, other aboriginal groups and other
10 stakeholders. Unfortunately, neither the Scoping Document nor the EIS describe how
11 relevant issues and concerns will be identified nor how Métis members will be involved.

12 The EIS states that "Monitoring is outlined for situations where the ATK and technical
13 assessments differ, where a prediction has substantial uncertainty or a difference
14 between predicted and actual residual effects could substantially alter the effects
15 assessment." (TE-SV-7.0, Section 7.4.10, p. 7-152; R to EIS, Section 5.3.2.1, p. 5-7).

16 It is not clear how it would be determined that there is a potential for "substantial"
17 alteration to the effects assessment. The EIS contains extensive discussion of the role
18 the Keeyask Cree Nations (KCNs) will play in the monitoring and follow-up programs for
19 the Project, including participation in their development and implementation which
20 "will facilitate capacity building by providing employment and training opportunities" (R
21 to EIS, Section 8.2.7, p. 8-39) for their members. The EIS also discusses plans to facilitate
22 communications with KCN communities through forums such as open houses to keep
23 "community Members updated on Project activities, adverse effects, and proposed
24 mitigation strategies." (R to EIS, Section 8.2.7, p. 8-39). No mention is made in the EIS if
25 these same opportunities for participation and capacity building will be extended to
26 Manitoba Métis Federation members."

27 Will monitoring results be communicated on a regular basis to Manitoba Métis
28 Federation members? If so, what approach to communication (frequency, venue, in
29 person or in person meetings) would be taken?

30 **FOLLOW-UP QUESTION:**

31 The Partnership did not indicate if monitoring results will be communicated on a regular
32 basis to MMF members, nor was an approach to communication (frequency, venue, in
33 person or in person meetings) with the MMF described, as requested in the original IR.

34 No further questions at this time.

35 **RESPONSE:**

36 Please see the response to CEC Rd 2 MMF-0055b.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: N/A;**
2 **p. N/A**

3 **CEC Rd 2 MMF-0056**

4 **ORIGINAL PREAMBLE AND QUESTION (MMF-0017):**

5 EIS Scoping Document Reference: 7.0 Environmental Monitoring, Management and
6 follow-up: "The EIS will describe a preliminary outline of an environmental protection
7 program for monitoring and managing the effects of the Project on the biophysical and
8 socio-economic environments arising from the construction, operation, and
9 decommissioning of the Project".

10 The EIS provides a general outline of the terrestrial monitoring program, but contains no
11 details on the sampling design for the monitoring and follow-up programs for terrestrial
12 VECs including caribou and moose. The Preliminary Environmental Protection Program
13 (EPP) document, released on April 26, 2013, states "The Partnership currently plans to
14 file a preliminary draft of the Terrestrial Effects Monitoring Plan in the second quarter of
15 2013".

16 Is the draft terrestrial monitoring plan still scheduled to be released in the second
17 quarter of 2013? If so, please provide a copy to the Métis for review.

18 **FOLLOW-UP QUESTION:**

19 Please see follow-up questions under CEC Rd 1 MMF-0009g.

20 **RESPONSE:**

21 Follow-up questions to CEC Rd 1 MMF-0009g are responded to in CEC Rd 2 MMF-0048g.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section:**
2 **6.5.8.1.1; p. 6-137**

3 **CEC Rd 2 MMF-0057**

4 **ORIGINAL PREAMBLE AND QUESTION (MMF-0018):**

5 EIS Scoping Document Reference: 5.2 Cumulative Effects: "The cumulative effects
6 assessment will focus on VECs (as described in section 3.3.1) the may be adversely
7 affected by the Project and will consider likely adverse effects caused by the other
8 projects or human activities that overlap in time and space with those of the Project".

9 The EIS lacks a description of pre-disturbance baseline conditions for VECs such as
10 caribou and moose that can be used to assess the cumulative effects of development. A
11 general description is provided of caribou and moose conditions in the past and, based
12 on the qualitative descriptions from KCN members, it sounds like past development has
13 already had a significant cumulative impact on caribou and moose. Better technical data
14 on historical conditions is required to understand change in VEC condition from pre-
15 hydro development to the current day and into the future.

16 A similar issue was noted as part of the review process for the Bipole III project: "The
17 development of a baseline for evaluation of cumulative effects is more than a
18 description of current conditions, which alone can discount the effects of past changes
19 as simply the 'new normal'. Baseline development requires a retrospective analysis of
20 how VEC conditions have changed over time and whether that change is significant in
21 terms of the sustainability of the VEC." (Gunn and Noble, 2012)

22 Include a retrospective analysis of the historical or reference state of caribou and moose
23 VECs in order to establish baseline conditions from which to assess change in VECs over
24 time due to cumulative impacts of development in the region.

25 **FOLLOW-UP QUESTION:**

26 Information request satisfied. The Partnership provided historical information for moose
27 and caribou.

28 **RESPONSE:**

29 No response required.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section:**
 2 **7.5.2.2.1; p: 7-28**

3 **CEC Rd 2 MMF-0058a**

4 **ORIGINAL PREAMBLE AND QUESTION (MMF-0019a):**

5 EIS Scoping Document Reference: 5.2 Cumulative Effects: "The cumulative effects
 6 assessment will focus on VECs (as described in section 3.3.1) the may be adversely
 7 affected by the Project and will consider likely adverse effects caused by the other
 8 projects or human activities that overlap in time and space with those of the Project".

9 The qualitative nature of the CEA makes comparing VEC conditions from the past,
 10 present and into the future very difficult and highly subjective. The CEA does not
 11 present clear thresholds for understanding the significance of cumulative effects
 12 currently, or into the future. The only threshold we observed was the 65% undisturbed
 13 habitat threshold to sustain a caribou population from Environment Canada (2012), and
 14 currently only 48% of the caribou range in Zone 5 is undisturbed (R to EIS, Section
 15 6.5.8.1.1, p. 6-371), suggesting caribou are already experiencing significant cumulative
 16 impacts in the region. Quantitative thresholds are necessary for understanding the
 17 significance of past cumulative effects and the significance of future impacts on the
 18 VECs (Gunn and Noble 2012).

- 19 · Provide relevant, quantitative, threshold values for assessing the significance of
 20 cumulative effects on caribou and moose VECs.
 21 · Cumulative effects for caribou and moose are variously determined in Chapter 7 to
 22 be 'small', 'relatively small', or 'negligible'. Define the scales used to determine the
 23 magnitude and significance of cumulative effects acting on VECs.

24 **FOLLOW-UP QUESTION:**

25 See follow-up questions outlined in CEC Rd 1 MMF-0022 [see CEC Rd 2 MMF-0060] and
 26 CEC Rd 1 MMF-0006b [see CEC Rd MMF-0045b],

27 **RESPONSE:**

28 Please refer to the responses to the follow-up questions provided in CEC Rd 2 MMF-
 29 0060 and CEC Rd 2 MMF-0045b.

1 **REFERENCE: Volume: Response to EIS Guidelines;**
 2 **Section: 7.5.2.2.1; p: 7-28**

3 **CEC Rd 2 MMF-0058b**

4 **ORIGINAL PREAMBLE AND QUESTION (MMF-0019b):**

5 EIS Scoping Document Reference: 5.2 Cumulative Effects: "The cumulative effects
 6 assessment will focus on VECs (as described in section 3.3.1) the may be adversely
 7 affected by the Project and will consider likely adverse effects caused by the other
 8 projects or human activities that overlap in time and space with those of the Project".

9 The qualitative nature of the CEA makes comparing VEC conditions from the past,
 10 present and into the future very difficult and highly subjective. The CEA does not
 11 present clear thresholds for understanding the significance of cumulative effects
 12 currently, or into the future. The only threshold we observed was the 65% undisturbed
 13 habitat threshold to sustain a caribou population from Environment Canada (2012), and
 14 currently only 48% of the caribou range in Zone 5 is undisturbed (R to EIS, Section
 15 6.5.8.1.1, p. 6-371), suggesting caribou are already experiencing significant cumulative
 16 impacts in the region. Quantitative thresholds are necessary for understanding the
 17 significance of past cumulative effects and the significance of future impacts on the
 18 VECs (Gunn and Noble 2012).

- 19 • Provide relevant, quantitative, threshold values for assessing the significance of
 20 cumulative effects on caribou and moose VECs.
 21 • Cumulative effects for caribou and moose are variously determined in Chapter 7 to
 22 be 'small', 'relatively small', or 'negligible'. Define the scales used to determine the
 23 magnitude and significance of cumulative effects acting on VECs.

24 **FOLLOW-UP QUESTION:**

25 See follow-up questions outlined in CEC Rd 1 MMF-0003c [CEC Rd 2 MMF-0042c] and
 26 CEC Rd 1 MMF-0006b [CEC Rd 2 MMF-0045b].

27 **RESPONSE:**

28 Please see responses to follow-up questions outlined in the response to CEC Rd 2 MMF-
 29 0042c and CEC Rd 2 MMF-0045b.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
2 **Volume; Section: 7.5.2.2.3 Summary of Cumulative Effects of the**
3 **Project with Past and Current Projects/Activities - Mammals; Page**
4 **No.: 7-29, 7-30**

5 **CEC Rd 2 MMF-0059**

6 **ORIGINAL PREAMBLE AND QUESTION (MMF-0020):**

7 The manner in which Project related effects are discussed in the CEA downplays the
8 significance of the total cumulative effects caused by past and current developments
9 and the addition of any Project specific impacts to that total. For example, the Project is
10 expected to have small or negligible impacts on cumulative effects for caribou, yet
11 based on habitat disturbance thresholds provided in the EIS (See MMF IR# 19) it would
12 appear that there already are significant cumulative effects of development on caribou
13 in the region.

14 When discussing the cumulative effects of the Project with past and current
15 projects/activities as this section does, it would seem like the effect of the Project
16 should be added to the pre-existing cumulative effects to determine total cumulative
17 effects and then assess their significance. Instead this section primarily discusses Project
18 specific effects relative to cumulative effects from past and current projects/activities,
19 downplaying the importance of the total cumulative effect on the VEC in question.
20 Discuss the significance of total cumulative effects on caribou and moose in the
21 presence and absence of the Project. Does significance of the cumulative effect change
22 by adding or removing the Project?

23 **FOLLOW-UP QUESTION:**

24 See follow-up questions outlined in CEC Rd 1 MMF-0003a [CEC Rd 2 MMF-0042a] and
25 CEC Rd 1 MMF-0006b [CEC Rd 2 MMF-0045b].

26 **RESPONSE:**

27 Please see the responses to CEC Rd 2 MMF-0042a and CEC Rd 2 MMF-0045b.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
 2 **Volume; Section: 7.5.2.2.3 Summary of Cumulative Effects of the**
 3 **Project with Past and Current Projects/Activities - Mammals; Page**
 4 **No.: 7-29, 7-30**

5 **CEC Rd 2 MMF-0060**

6 **ORIGINAL PREAMBLE AND QUESTION (MMF-0021):**

7 Original Preamble: EIS Scoping Document Reference: 5.2 Cumulative Effects: "The
 8 cumulative effects assessment will focus on VECs (as described in section 3.3.1) the may
 9 be adversely affected by the Project and will consider likely adverse effects caused by
 10 the other projects or human activities that overlap in time and space with those of the
 11 Project".

12 The manner in which Project related effects are discussed in the CEA downplays the
 13 significance of the total cumulative effects caused by past and current developments
 14 and the addition of any Project specific impacts to that total. For example, the Project is
 15 expected to have small or negligible impacts on cumulative effects for caribou, yet
 16 based on habitat disturbance thresholds provided in the EIS (See MMF IR# 19) it would
 17 appear that there already are significant cumulative effects of development on caribou
 18 in the region. When discussing the cumulative effects of the Project with past and
 19 current projects/activities as this section does, it would seem like the effect of the
 20 Project should be added to the pre-existing cumulative effects to determine total
 21 cumulative effects and then assess their significance. Instead this section primarily
 22 discusses Project specific effects relative to cumulative effects from past and current
 23 projects/activities, downplaying the importance of the total cumulative effect on the
 24 VEC in question.

25 Discuss the significance of total cumulative effects on caribou and moose in the
 26 presence and absence of the Project. Does significance of the cumulative effect change
 27 by adding or removing the Project?

28 **FOLLOW-UP QUESTION:**

29 See follow-up questions outlined in CEC Rd 1 MMF-0003a [CEC Rd 2 CEC-0042a] and CEC
 30 Rd 1 MMF-0006b [CEC Rd 2 CEC-0045b].

31 **RESPONSE:**

32 See responses to referenced follow-up questions.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section:**
 2 **7.5.2.3.3 Cumulative Effects of the Project including Future**
 3 **Projects/Activities - Mammals; Page No.: 7-35**

4 **CEC Rd 2 MMF-0061**

5 **ORIGINAL PREAMBLE AND QUESTION (MMF-0022):**

6 EIS Scoping Document Reference: 5.2 Cumulative Effects: "The cumulative effects
 7 assessment will focus on VECs (as described in section 3.3.1) the may be adversely
 8 affected by the Project and will consider likely adverse effects caused by the other
 9 projects or human activities that overlap in time and space with those of the Project".

10 Linear disturbances are well known to have complex and significant impacts on caribou
 11 distribution and movement (Dyer et al. 2001; Scurrah and Schindler 2012). The EIS
 12 states that while "the Keeyask Transmission Project could result in one or more
 13 transmission line rights-of-way south of Stephens Lake, it is not likely to limit caribou
 14 from passing through the area and calving on islands in the lake" (R to EIS, Section
 15 7.5.2.3.3, p. 7-35), but provides no evidence to support this statement. The EIS assumes
 16 there will be no significant cumulative effect of future projects. Original Question:
 17 Provide supporting literature or data for the assumption that future increases in linear
 18 disturbance will not hinder movement or restrict the distribution of caribou in the
 19 region.

20 **FOLLOW-UP QUESTION:**

21 The Partnership uses a 0.60 km/km² (Salmo Consulting et al. 2003; Athabasca
 22 Landscape Team 2009) linear feature density benchmark below which the magnitude of
 23 the effects of linear feature density on caribou are classified as low. According to Salmo
 24 Consulting et al. (2003), this threshold is designed for a "Enhanced Resource
 25 Development and Agriculture/Settlement Area" Provincial Land Use Category.

- 26 · What is the provincial land use category for the Keeyask study area?
 27 · Were seismic lines included in the calculation of linear feature density?

28 **RESPONSE:**

29 To clarify, a number of sources were considered and used to establish the linear feature
 30 benchmarks, including both Salmo et al. (2003) and the Athabasca Landscape Team
 31 (2009). While these benchmarks appear consistent with the Enhanced Resource
 32 Development and Agriculture/Settlement Area classification, this is not the reason the
 33 benchmarks were established.

34 Each of the above questions are answered in turn.

35 *What is the provincial land use category for the Keeyask study area?*

36 The Generalized Resource Management Areas land use category from Salmo et al.
37 (2003) best applies to Manitoba's provincial land use category. Examples include
38 hydroelectric development along the Nelson River, settlements, a highway, commercial
39 forestry in the Thompson area, licensed resource harvesting in natural areas, expanses
40 of undeveloped Crown land and a large candidate protected area. These land uses are
41 described in detail in the Response to EIS Guidelines Sections 4.1, 4.4 and 6.2 and in
42 Sections 6.2.3.5.2, 6.2.3.5.3, 6.2.3.5.4., 6.2.3.6, 6.2.3.6.2 and 6.2.3.6.4.

43 *Were seismic lines included in the calculation of linear feature density?*

44 All cutlines, regardless of source, including seismic lines, are captured in the total linear
45 feature density and the cutline values were reported in the Response to EIS Guidelines
46 Sections 6.2.3.4.2 and 6.5.3.3, and in the Terrestrial Environment Supporting Volume
47 Section 2.4.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 5.2, 6.6**
 2 **(R to EIS); 1.0 (SE SV); Page No.: 5-1, 5-6, 6-426 (R to EIS); 1-18 (SE**
 3 **SV)**

4 **CEC Rd 2 MMF-0062**

5 **ORIGINAL PREAMBLE AND QUESTION (MMF-0023):**

6 "EIS Scoping Document Reference: 3.5 Spatial and Temporal Boundaries. Spatial
 7 boundaries (i.e. the study areas) will be established for the Project effects assessment.
 8 Study areas may vary between various environmental components, as appropriate. The
 9 EIS will explain the rationale used to determine the study area for various
 10 environmental components.

11 5.1 Project Effects. The EIS will identify the potential positive and adverse environmental
 12 effects of the Project. Measures to mitigate potential effects that are technically and
 13 economically feasible will be identified. Potential effects that remain after the
 14 application of mitigation will be considered to be potential residual effects.

15 The EIS states that the extent to which the Project would have an effect on people
 16 "...depends largely on their proximity to and level of involvement in the Project" (R to
 17 EIS, Section 6.6, p. 6-426). The Socio-economic Local Study Area is defined as consisting
 18 of "...the four partner First Nation communities of TCN, WLFN, FLCN and YFFN, the Town
 19 of Gillam and the City of Thompson..." (R to EIS, Section 6.6, p. 6-426). The EIS goes on
 20 to state that the four KCNs are affected by the Project through the following pathways
 21 of effect:

- 22 · Physical/biophysical effects on resource use/traditional use areas and heritage
- 23 resources;
- 24 · Employment and business effects;
- 25 · Construction worker interaction within the partners' home communities; and
- 26 · Investment income (Socio-economic SV, Section 1, p. 1-18).

27 The Project was subject to two evaluations, "...the first of which was conducted by the
 28 Keeyask Cree Nations (KCNs) for their internal purposes and the second of which is a
 29 public review currently being conducted by federal and provincial environmental
 30 regulators" (R to EIS, Section 5.2, p. 5-1). As "in-vicinity" First Nations, the KCNs are
 31 described as having "...played an integral role, along with Manitoba Hydro, in directing
 32 and shaping the assessment" (R to EIS, Section 5.2, p. 5-6).

33 There are Métis residing in the Local Study Area, including, , the Town of Gillam and
 34 some of the KCNS. As well, there are Métis living in Regional Study Area, including, the

35 City of Thompson. These Métis, as well as other Métis, use and rely on the land in the
 36 Local and Regional Study Areas. Despite this, the Métis have not been considered or
 37 assessed as a distinct group in the Local Study Area."

- 38 · What criteria were used to define the KCNs in the Local Study Area as "in-vicinity"?
- 39 · What criteria were used to exclude the Métis from being defined as "in-vicinity",
 40 particularly those who reside in the Local Study Area?
- 41 · Why were the Métis not identified as a distinct group in the Local Study Area?
- 42 · Explain how the Métis in the Local Study Area will not be affected by the same
 43 pathways of effect as are identified for the KCNs.
- 44 · Why were impacts of the Project on Métis in the Local Study Area not considered
 45 and assessed, as a distinct group, and to the same level of assessment, as First
 46 Nations in the Local Study Area?
- 47 · Why was there no equivalent evaluation process provided to the Manitoba Métis
 48 Federation to evaluate the impacts of the project on the Métis residing in and using
 49 the Local Study Area, similar to the evaluation process that was provided to the First
 50 Nations in the Local Study Area?
- 51 · Explain how impacts on the Métis, as a distinct group in the Local Study Area, have
 52 been adequately assessed, without consideration of the Métis as a distinct group in
 53 the Local Study Area, and without the provision of this same evaluation process to
 54 the Métis."

55 **FOLLOW-UP QUESTION:**

56 In addition to understanding the nature of the Métis community in the Keeyask region,
 57 and any potential effects that may be experienced as a result of the Project, will the
 58 results of the Métis-specific Traditional Land Use and Knowledge Study (TLUKS), Socio-
 59 economic Impact Assessment and historical narrative for the Keeyask region be used to
 60 identify new mitigation measures and revise existing mitigation measures, where
 61 necessary, to address Project impacts on the Métis?

62 **RESPONSE:**

63 The Partnership remains committed to considering any additional information provided
 64 on the use of lands and resources by any Metis community that may be provided
 65 through these MMF-led studies. The Partnership is committed to further dialogue with
 66 the MMF so that it can determine how best to incorporate this new information into
 67 planning and development processes for the Keeyask Generation Project, once it is
 68 available.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 4.3.3**
2 **Environmental Mitigation/Compensation; 6.6.2 Aboriginal**
3 **Traditional Knowledge; Page No.: 4-15, 6-430**

4 **CEC Rd 2 MMF-0063a**

5 **ORIGINAL PREAMBLE AND QUESTION (MMF-0024a):**

6 EIS Scoping Document Reference: 5.1 Project Effects. The EIS will identify the potential
7 positive and adverse environmental effects of the Project. Measures to mitigate
8 potential effects that are technically and economically feasible will be identified.
9 Potential effects that remain after the application of mitigation will be considered to be
10 potential residual effects.

11 Each of the KCNs negotiated an Adverse Effects Agreement (AEA) with Manitoba Hydro
12 "...as a proactive approach... ..to address known and foreseeable adverse effects their
13 traditional knowledge and past experience with hydro development was telling them
14 would occur" (R to EIS, Section 6.6.2, p. 6-430). The AEAs include mitigation and
15 offsetting programs that are intended to provide replacements and opportunities to
16 offset unavoidable adverse effects of the Project (R to EIS, Section 4.3.3, p. 4-15).

17 There are Métis residing in the Local Study Area, including, , the Town of Gillam and
18 some of the KCNS. As well, there are Métis living in Regional Study Area, including, the
19 City of Thompson. These Métis, as well as other Métis, use and rely on the land in the
20 Local and Regional Study Areas. Despite this, the Métis have not been considered or
21 assessed as a distinct group in the Local Study Area.

22 · At what point during the Project environmental assessment were the AEAs
23 negotiated with the KCNs?

24 **FOLLOW-UP QUESTION:**

25 Information request satisfied. The timing of negotiation of the Adverse Effects
26 Agreements with the KCNs is explained.

27 **RESPONSE:**

28 No response required.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 4.3.3**
 2 **Environmental Mitigation/Compensation; 6.6.2 Aboriginal**
 3 **Traditional Knowledge; Page No.: 4-15, 6-430**

4 **CEC Rd 2 MMF-0063b**

5 **ORIGINAL PREAMBLE AND QUESTION (MMF-0024b):**

6 EIS Scoping Document Reference: 5.1 Project Effects. The EIS will identify the potential
 7 positive and adverse environmental effects of the Project. Measures to mitigate
 8 potential effects that are technically and economically feasible will be identified.
 9 Potential effects that remain after the application of mitigation will be considered to be
 10 potential residual effects.

11 Each of the KCNs negotiated an Adverse Effects Agreement (AEA) with Manitoba Hydro
 12 "...as a proactive approach... ..to address known and foreseeable adverse effects their
 13 traditional knowledge and past experience with hydro development was telling them
 14 would occur" (R to EIS, Section 6.6.2, p. 6-430). The AEAs include mitigation and
 15 offsetting programs that are intended to provide replacements and opportunities to
 16 offset unavoidable adverse effects of the Project (R to EIS, Section 4.3.3, p. 4-15).

17 There are Métis residing in the Local Study Area, including, , the Town of Gillam and
 18 some of the KCNS. As well, there are Métis living in Regional Study Area, including, the
 19 City of Thompson. These Métis, as well as other Métis, use and rely on the land in the
 20 Local and Regional Study Areas. Despite this, the Métis have not been considered or
 21 assessed as a distinct group in the Local Study Area.

22 How were "known and foreseeable adverse effects" accepted or validated by Manitoba
 23 Hydro or the KHLF?

24 **FOLLOW-UP QUESTION:**

- 25 · Will an Adverse Effect Agreement be negotiated with the MMF?
 26 · Will the MMF have the opportunity to validate it through a community ratification
 27 process or other means appropriate to the MMF?

28 **RESPONSE:**

29 Whether an Adverse Effects Agreement will be entered into with the MMF is not
 30 something that can be confirmed at this time.

31 Manitoba Hydro, on behalf of the KHLF, is currently engaged with the MMF to fund
 32 work related to the Keeyask Project including: a Traditional Land Use and Knowledge
 33 Study ("TLUKS"), a Metis Socio-economic impact assessment, and a historical narrative

34 documenting historic and contemporary Metis use and presence in Northern Manitoba
35 generally, and the Keeyask Local and Regional Resource Use study areas
36 specifically. Through this work, there will be a better understanding by all parties
37 regarding Metis current and historical presence in the study area, including activities
38 undertaken and resource use by the Metis. The results of this work will also contribute
39 to a better understanding of how the Keeyask Project may or may not impact the Metis.
40 Until such a time as the studies are complete, Manitoba Hydro, on behalf of the
41 Partnership, cannot confirm what measures would be taken to address Metis-specific
42 concerns regarding the Project. However, generally speaking, efforts would first focus
43 on avoiding or mitigating potential adverse effects.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 4.3.3**
 2 **Environmental Mitigation/Compensation; 6.6.2 Aboriginal**
 3 **Traditional Knowledge; Page No.: 4-15, 6-430**

4 **CEC Rd 2 MMF-0063c**

5 **ORIGINAL PREAMBLE AND QUESTION (MMF-0024c):**

6 EIS Scoping Document Reference: 5.1 Project Effects. The EIS will identify the potential
 7 positive and adverse environmental effects of the Project. Measures to mitigate
 8 potential effects that are technically and economically feasible will be identified.
 9 Potential effects that remain after the application of mitigation will be considered to be
 10 potential residual effects. Each of the KCNs negotiated an Adverse Effects Agreement
 11 (AEA) with Manitoba Hydro "...as a proactive approach... ..to address known and
 12 foreseeable adverse effects their traditional knowledge and past experience with hydro
 13 development was telling them would occur" (R to EIS, Section 6.6.2, p. 6-430). The AEA's
 14 include mitigation and offsetting programs that are intended to provide replacements
 15 and opportunities to offset unavoidable adverse effects of the Project (R to EIS, Section
 16 4.3.3, p. 4-15).

17 There are Métis residing in the Local Study Area, including, , the Town of Gillam and
 18 some of the KCNS. As well, there are Métis living in Regional Study Area, including, the
 19 City of Thompson. These Métis, as well as other Métis, use and rely on the land in the
 20 Local and Regional Study Areas. Despite this, the Métis have not been considered or
 21 assessed as a distinct group in the Local Study Area.

22 · How were "known and foreseeable adverse effects" quantified by Manitoba Hydro or
 23 the KHLP for the AEA's?

24 **FOLLOW-UP QUESTION:**

- 25 · Will an Adverse Effect Agreement be negotiated with the MMF?
 26 · If yes, what process will be used to assess the foreseeable adverse effects of the
 27 project, and to reach a negotiated Adverse Effect Agreement with the MMF?
 28 · If yes, what range of factors will be considered in determining and negotiating the
 29 monetary value of the Adverse Effect Agreement (i.e. cost of implementing
 30 Offsetting Programs, population, and use of the Project area)?

31 **RESPONSE:**

32 Please see the response to CEC Rd 2 MMF-0063b.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 4.3.3**
2 **Environmental Mitigation/Compensation; 6.6.2 Aboriginal**
3 **Traditional Knowledge; Page No.: 4-15, 6-430**

4 **CEC Rd 2 MMF-0063d**

5 **ORIGINAL PREAMBLE AND QUESTION (MMF-0024d):**

6 EIS Scoping Document Reference: 5.1 Project Effects. The EIS will identify the potential
7 positive and adverse environmental effects of the Project. Measures to mitigate
8 potential effects that are technically and economically feasible will be identified.
9 Potential effects that remain after the application of mitigation will be considered to be
10 potential residual effects.

11 Each of the KCNs negotiated an Adverse Effects Agreement (AEA) with Manitoba Hydro
12 "...as a proactive approach... ..to address known and foreseeable adverse effects their
13 traditional knowledge and past experience with hydro development was telling them
14 would occur" (R to EIS, Section 6.6.2, p. 6-430). The AEAs include mitigation and
15 offsetting programs that are intended to provide replacements and opportunities to
16 offset unavoidable adverse effects of the Project (R to EIS, Section 4.3.3, p. 4-15).

17 There are Métis residing in the Local Study Area, including, , the Town of Gillam and
18 some of the KCNS. As well, there are Métis living in Regional Study Area, including, the
19 City of Thompson. These Métis, as well as other Métis, use and rely on the land in the
20 Local and Regional Study Areas. Despite this, the Métis have not been considered or
21 assessed as a distinct group in the Local Study Area.

22 · In addition to traditional knowledge and past experience, what information from
23 the environmental and socioeconomic assessment (e.g. regarding potential impacts
24 of the Project on the KCNs) informed the content of the AEAs?

25 **FOLLOW-UP QUESTION:**

26 Information request satisfied. The content of the AEAs is explained.

27 **RESPONSE:**

28 No response required.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 4.3.3**
2 **Environmental Mitigation/Compensation; 6.6.2 Aboriginal**
3 **Traditional Knowledge; Page No.: 4-15, 6-430**

4 **CEC Rd 2 MMF-0063e**

5 **ORIGINAL PREAMBLE AND QUESTION (MMF-0024e):**

6 EIS Scoping Document Reference: 5.1 Project Effects. The EIS will identify the potential
7 positive and adverse environmental effects of the Project. Measures to mitigate
8 potential effects that are technically and economically feasible will be identified.
9 Potential effects that remain after the application of mitigation will be considered to be
10 potential residual effects.

11 Each of the KCNs negotiated an Adverse Effects Agreement (AEA) with Manitoba Hydro
12 "...as a proactive approach... ..to address known and foreseeable adverse effects their
13 traditional knowledge and past experience with hydro development was telling them
14 would occur" (R to EIS, Section 6.6.2, p. 6-430). The AEAs include mitigation and
15 offsetting programs that are intended to provide replacements and opportunities to
16 offset unavoidable adverse effects of the Project (R to EIS, Section 4.3.3, p. 4-15).

17 There are Métis residing in the Local Study Area, including, the Town of Gillam and some
18 of the KCNS. As well, there are Métis living in Regional Study Area, including, the City of
19 Thompson. These Métis, as well as other Métis, use and rely on the land in the Local and
20 Regional Study Areas. Despite this, the Métis have not been considered or assessed as a
21 distinct group in the Local Study Area.

- 22 · What efforts were undertaken to gather and document Métis past experiences with
23 hydro development and Metis traditional knowledge, with the same purpose of
24 addressing "known and foreseeable adverse effects" on the Métis?

25 **FOLLOW-UP QUESTION:**

26 Efforts to gather and document Métis past experiences with hydro development and
27 Métis traditional knowledge, with the purpose of addressing "known and foreseeable
28 adverse effects" on the Métis are described as being provided through the Keeyask
29 Public Involvement Program. According to the Partnership, the Métis have had the
30 opportunity to learn about the project and express any concerns through the Public
31 Involvement Program. No further questions at this time.

32 **RESPONSE:**

33 No response required.



1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 4.3.3**
 2 **Environmental Mitigation/Compensation; 6.6.2 Aboriginal**
 3 **Traditional Knowledge; Page No.: 4-15, 6-430**

4 **CEC Rd 2 MMF-0063f**

5 **ORIGINAL PREAMBLE AND QUESTION (MMF-0024f):**

6 EIS Scoping Document Reference: 5.1 Project Effects. The EIS will identify the potential
 7 positive and adverse environmental effects of the Project. Measures to mitigate
 8 potential effects that are technically and economically feasible will be identified.
 9 Potential effects that remain after the application of mitigation will be considered to be
 10 potential residual effects.

11 Each of the KCNs negotiated an Adverse Effects Agreement (AEA) with Manitoba Hydro
 12 "...as a proactive approach... ..to address known and foreseeable adverse effects their
 13 traditional knowledge and past experience with hydro development was telling them
 14 would occur" (R to EIS, Section 6.6.2, p. 6-430). The AEAs include mitigation and
 15 offsetting programs that are intended to provide replacements and opportunities to
 16 offset unavoidable adverse effects of the Project (R to EIS, Section 4.3.3, p. 4-15).

17 There are Métis residing in the Local Study Area, including, , the Town of Gillam and
 18 some of the KCNS. As well, there are Métis living in Regional Study Area, including, the
 19 City of Thompson. These Métis, as well as other Métis, use and rely on the land in the
 20 Local and Regional Study Areas. Despite this, the Métis have not been considered or
 21 assessed as a distinct group in the Local Study Area.

- 22 · Describe any mitigation or offset programs that include or apply specifically to the
 23 Métis.

24 **FOLLOW-UP QUESTION:**

- 25 · How many "mitigation programs" are there in all, and what are these programs?
 26 · How many "mitigation programs" are restricted to specific groups?
 27 ○ What are these programs?
 28 ○ Which specific groups are they restricted to?

29 **RESPONSE:**

30 Chapter 8 of the *Keeyask Generation Project: Response to the EIS Guidelines* describes
 31 monitoring and follow-up programs to be undertaken during construction and operation
 32 of the project. Chapter 8 includes an overview of the Environmental Protection Program
 33 and how it will be implemented (Section 8.1 & 8.3), provides an overview of the

34 monitoring to be undertaken (Section 8.2), and includes a discussion on how adaptive
35 management (Section 8.1.3 – pages 8-7 and 8-9) will be incorporated into monitoring.

36 The *Preliminary Environmental Protection Program* (available at Keeyask.com) and the
37 various plans contained therein, include a range of mitigation measures and programs
38 which will be put in place, such as the Waterways Management Program. In most cases,
39 these are not restricted to any specific group though in some instances they would
40 naturally apply to only certain segments of the population (e.g. resource users).

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 4.3.3**
 2 **Environmental Mitigation/Compensation; 6.6.2 Aboriginal**
 3 **Traditional Knowledge; Page No.: 4-15, 6-430**

4 **CEC Rd 2 MMF-0063g**

5 **ORIGINAL PREAMBLE AND QUESTION (MMF-0024g):**

6 EIS Scoping Document Reference: 5.1 Project Effects. The EIS will identify the potential
 7 positive and adverse environmental effects of the Project. Measures to mitigate
 8 potential effects that are technically and economically feasible will be identified.
 9 Potential effects that remain after the application of mitigation will be considered to be
 10 potential residual effects.

11 Each of the KCNs negotiated an Adverse Effects Agreement (AEA) with Manitoba Hydro
 12 "...as a proactive approach... ..to address known and foreseeable adverse effects their
 13 traditional knowledge and past experience with hydro development was telling them
 14 would occur" (R to EIS, Section 6.6.2, p. 6-430). The AEAs include mitigation and
 15 offsetting programs that are intended to provide replacements and opportunities to
 16 offset unavoidable adverse effects of the Project (R to EIS, Section 4.3.3, p. 4-15).

17 There are Métis residing in the Local Study Area, including, , the Town of Gillam and
 18 some of the KCNS. As well, there are Métis living in Regional Study Area, including, the
 19 City of Thompson. These Métis, as well as other Métis, use and rely on the land in the
 20 Local and Regional Study Areas. Despite this, the Métis have not been considered or
 21 assessed as a distinct group in the Local Study Area.

22 • Why was an AEA not negotiated with the Manitoba Métis Federation?

23 **QUESTION:**

24 The Partnership states that an Adverse Effects Agreement was not negotiated with any
 25 Métis community or organization as they are not aware of any Métis community in the
 26 vicinity of the project or of any potential project impact specific to the Métis. This is
 27 based on the knowledge of the broader Study Area provided to them by the KCNs, as
 28 well as the Partnership's "years of study to document the existing socio-economic
 29 environment". No further questions at this time.

30 **RESPONSE:**

31 No response required.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 4.3.3**
 2 **Environmental Mitigation/Compensation; 6.6.2 Aboriginal**
 3 **Traditional Knowledge; Page No.: 4-15, 6-430**

4 **CEC Rd 2 MMF-0063h**

5 **ORIGINAL PREAMBLE AND QUESTION (MMF-0024h):**

6 EIS Scoping Document Reference: 5.1 Project Effects. The EIS will identify the potential
 7 positive and adverse environmental effects of the Project. Measures to mitigate
 8 potential effects that are technically and economically feasible will be identified.
 9 Potential effects that remain after the application of mitigation will be considered to be
 10 potential residual effects.

11 Each of the KCNs negotiated an Adverse Effects Agreement (AEA) with Manitoba Hydro
 12 "...as a proactive approach... ..to address known and foreseeable adverse effects their
 13 traditional knowledge and past experience with hydro development was telling them
 14 would occur" (R to EIS, Section 6.6.2, p. 6-430). The AEAs include mitigation and
 15 offsetting programs that are intended to provide replacements and opportunities to
 16 offset unavoidable adverse effects of the Project (R to EIS, Section 4.3.3, p. 4-15).

17 There are Métis residing in the Local Study Area, including, , the Town of Gillam and
 18 some of the KCNS. As well, there are Métis living in Regional Study Area, including, the
 19 City of Thompson. These Métis, as well as other Métis, use and rely on the land in the
 20 Local and Regional Study Areas. Despite this, the Métis have not been considered or
 21 assessed as a distinct group in the Local Study Area.

22 · Explain how impacts on the Métis, as a distinct group in the Local Study Area, have
 23 been adequately mitigated, without consideration of the Métis as a distinct group in
 24 the Local Study Area, and without negotiation of an AEA with the Métis.

25 **FOLLOW-UP QUESTION:**

26 · Will the results of the Métis-specific Traditional Land Use and Knowledge Study
 27 (TLUKS), Socio-economic Impact Assessment and historical narrative for the Keeyask
 28 region be used to identify potential impacts of the project to the Métis, as a distinct
 29 group of people within the study area? If yes, please explain how (i.e. by what
 30 process).
 31 · If new/additional impacts are identified through the above studies, will the
 32 Partnership identify new mitigation measures, revise existing mitigation measures
 33 as necessary, and also negotiate an agreement regarding the mitigation of Project
 34 impacts on the Métis?

35 **RESPONSE:**

36 Each of the above questions is answered in turn.

37 *Will the results of the Métis-specific Traditional Land Use and Knowledge Study (TLUKS),*
38 *Socio-economic Impact Assessment and historical narrative for the Keeyask region be*
39 *used to identify potential impacts of the project to the Métis, as a distinct group of*
40 *people within the study area? If yes, please explain how (i.e. by what process).*

41 The referenced studies are being undertaken and led by the MMF. It is the Partnership's
42 understanding that, as part of these studies, the MMF will identify what it believes are
43 the impacts to the Metis as a result of developing the Keeyask Generation Project.

44 *If new/additional impacts are identified through the above studies, will the Partnership*
45 *identify new mitigation measures, revise existing mitigation measures as necessary, and*
46 *also negotiate an agreement regarding the mitigation of Project impacts on the Métis?*

47 The Partnership remains committed to considering any additional information provided
48 through these studies. The Partnership will discuss the findings with the MMF and then
49 determine how best to incorporate this new information into planning and
50 development processes for the Keeyask Generation Project.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 8.0**
 2 **Monitoring and Follow-up; Page No.: 8-1, 8-3, 8-6, 8-27 - 8-33**

3 **CEC Rd 2 MMF-0064a**

4 **ORIGINAL PREAMBLE AND QUESTION (MMF-0025a):**

5 EIS Scoping Document Reference: 7.0 Environmental Monitoring, Management and
 6 Follow-up. The EIS will describe a preliminary outline of an environmental protection
 7 program for monitoring and managing the effects of the Project on the biophysical and
 8 socio-economic environments arising from the construction, operation, and
 9 decommissioning of the Project. ...The monitoring programs will determine effects of
 10 the Project, including: whether they are consistent with the analysis in the
 11 environmental impact assessment; whether they assess the effectiveness of remedial
 12 measures; and whether they allow for adaptive management and mitigation measures
 13 to be implemented if unforeseen impacts occur.

14 The EIS states that an Environmental Protection Program will be developed to mitigate,
 15 manage and monitor potential environmental effects during the construction and
 16 operation phases of the Project. It will be comprised of three types of plans: protection
 17 plans, management plans, and monitoring plans (R to EIS, Chapter 8.0, p. 8-1).

18 Environmental monitoring plans are designed "...to measure the actual effects of the
 19 Project, test predictions or identify unanticipated effects" (p. 8-6). A Socio-economic
 20 Monitoring Plan (SEMP) will be developed to monitor effects on components "...such as
 21 employment, business opportunities, traffic, and safety" (R to EIS, Chapter 8.0, p. 8-6).

22 The EIS states that the SEMP will be developed by the Partnership, and it is expected
 23 that the KCNs will play a central role in its development and implementation (R to EIS,
 24 Chapter 8.0, p. 8-27).

25 There are Métis residing in the Local Study Area, including, the Town of Gillam and some
 26 of the KCNS. As well, there are Métis living in Regional Study Area, including, the City of
 27 Thompson. These Métis, as well as other Métis, use and rely on the land in the Local and
 28 Regional Study Areas. Despite this, the Métis have not been considered or assessed as a
 29 distinct group in the Local Study Area.

30 · Will the Métis, particularly those residing in and using the Local Study Area, be
 31 involved in the development and implementation of the SEMP? If yes, explain to
 32 what extent the Métis will be involved. If no, explain why the Métis will not be
 33 involved.

34 **FOLLOW-UP QUESTION:**

35 The Partnership does not wholly explain why the Métis will not be involved in the
36 development and implementation of the SEMP, while the KCNs "...will play a central
37 role...". The Partnership does provide access to the draft SEMP filed with the regulators
38 on June 28, 2013.

- 39 · If new/additional impacts are identified through the Métis-specific Traditional Land
40 Use and Knowledge Study (TLUKS), Socio-economic Impact Assessment and
41 historical narrative for the Keeyask region, will the Partnership revise the SEMP to
42 include monitoring (and adaptive management) of such impacts?
43 · For example, in Section 4.2.1 of the draft SEMP, the Partnership states the "KCNs
44 Members are the predominant users of the waterways upstream and downstream
45 of the Project. Métis, other Aboriginal and non-Aboriginal people may also use the
46 waterways in the vicinity of the Project..." (p. 4-2).

47 **RESPONSE:**

48 As stated in response to MMF-0025a, the SEMP is a preliminary monitoring plan subject
49 to revision upon receipt of licence terms and conditions. It is available for public review
50 on the Partnership's Website. The response to CEC Rd 2 MMF-0055b documents the
51 processes available for the MMF to provide comments on the monitoring plans.

52 The Partnership remains committed to considering any additional information provided
53 through the MMF-led studies referenced above. The Partnership is committed to further
54 dialogue with the MMF so that I can determine how best to incorporate this new
55 information into planning and development processes for the Keeyask Generation
56 Project, once it is available.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 8.0**
 2 **Monitoring and Follow-up; Page No.: 8-1, 8-3, 8-6, 8-27 - 8-33**

3 **CEC Rd 2 MMF-0064b**

4 **ORIGINAL PREAMBLE AND QUESTION (MMF-0025b):**

5 EIS Scoping Document Reference: 7.0 Environmental Monitoring, Management and
 6 Follow-up. The EIS will describe a preliminary outline of an environmental protection
 7 program for monitoring and managing the effects of the Project on the biophysical and
 8 socio-economic environments arising from the construction, operation, and
 9 decommissioning of the Project. ...The monitoring programs will determine effects of
 10 the Project, including: whether they are consistent with the analysis in the
 11 environmental impact assessment; whether they assess the effectiveness of remedial
 12 measures; and whether they allow for adaptive management and mitigation measures
 13 to be implemented if unforeseen impacts occur.

14 The EIS states that an Environmental Protection Program will be developed to mitigate,
 15 manage and monitor potential environmental effects during the construction and
 16 operation phases of the Project. It will be comprised of three types of plans: protection
 17 plans, management plans, and monitoring plans (R to EIS, Chapter 8.0, p. 8-1).

18 Environmental monitoring plans are designed "...to measure the actual effects of the
 19 Project, test predictions or identify unanticipated effects" (p. 8-6). A Socio-economic
 20 Monitoring Plan (SEMP) will be developed to monitor effects on components "...such as
 21 employment, business opportunities, traffic, and safety" (R to EIS, Chapter 8.0, p. 8-6).

22 The EIS states that the SEMP will be developed by the Partnership, and it is expected
 23 that the KCNs will play a central role in its development and implementation (R to EIS,
 24 Chapter 8.0, p. 8-27).

25 There are Métis residing in the Local Study Area, including, the Town of Gillam and some
 26 of the KCNS. As well, there are Métis living in Regional Study Area, including, the City of
 27 Thompson. These Métis, as well as other Métis, use and rely on the land in the Local and
 28 Regional Study Areas. Despite this, the Métis have not been considered or assessed as a
 29 distinct group in the Local Study Area.

30 · Where specific impacts on the Métis have not been identified, explain how the
 31 SEMP will "identify unanticipated effects" that are experienced by the Métis as a
 32 result of the Project.

33 **FOLLOW-UP QUESTION:**

34 The Partnership states that monitoring of actual Project effects in the Local and Regional
 35 Study Areas will capture effects on the Métis. No further questions at this time.

- 36 **RESPONSE:**
- 37 No response required.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 8.0**
 2 **Monitoring and Follow-up; Page No.: 8-1, 8-3, 8-6, 8-27 - 8-33**

3 **CEC Rd 2 MMF-0064c**

4 **ORIGINAL PREAMBLE AND QUESTION (MMF-0025c):**

5 EIS Scoping Document Reference: 7.0 Environmental Monitoring, Management and
 6 Follow-up. The EIS will describe a preliminary outline of an environmental protection
 7 program for monitoring and managing the effects of the Project on the biophysical and
 8 socio-economic environments arising from the construction, operation, and
 9 decommissioning of the Project. ...The monitoring programs will determine effects of
 10 the Project, including: whether they are consistent with the analysis in the
 11 environmental impact assessment; whether they assess the effectiveness of remedial
 12 measures; and whether they allow for adaptive management and mitigation measures
 13 to be implemented if unforeseen impacts occur.

14 The EIS states that an Environmental Protection Program will be developed to mitigate,
 15 manage and monitor potential environmental effects during the construction and
 16 operation phases of the Project. It will be comprised of three types of plans: protection
 17 plans, management plans, and monitoring plans (R to EIS, Chapter 8.0, p. 8-1).

18 Environmental monitoring plans are designed "...to measure the actual effects of the
 19 Project, test predictions or identify unanticipated effects" (p. 8-6). A Socio-economic
 20 Monitoring Plan (SEMP) will be developed to monitor effects on components "...such as
 21 employment, business opportunities, traffic, and safety" (R to EIS, Chapter 8.0, p. 8-6).

22 The EIS states that the SEMP will be developed by the Partnership, and it is expected
 23 that the KCNs will play a central role in its development and implementation (R to EIS,
 24 Chapter 8.0, p. 8-27).

25 There are Métis residing in the Local Study Area, including, the Town of Gillam and some
 26 of the KCNS. As well, there are Métis living in Regional Study Area, including, the City of
 27 Thompson. These Métis, as well as other Métis, use and rely on the land in the Local and
 28 Regional Study Areas. Despite this, the Métis have not been considered or assessed as a
 29 distinct group in the Local Study Area.

30 • Which of the "Supporting Topics or VECs" listed in Table 8-5 (p. 8-28) will have
 31 Métis-specific data gathered and documented as part of the monitoring activities?

32 **FOLLOW-UP QUESTION:**

33 No further questions at this time.

- 34 **RESPONSE:**
- 35 No response required.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 3.4.1.3**
 2 **Manitoba Métis Federation (R to EIS); Appendix 1A - Public**
 3 **Involvement Plan (PIP SV); Page No.: 3-2, 3-3 (R to EIS); 1A-7 (PIP**
 4 **SV)**

5 **CEC Rd 2 MMF-0065**

6 **ORIGINAL PREAMBLE AND QUESTION (MMF-0026):**

7 EIS Scoping Document Reference: 3.3.1 – Public Involvement – Aboriginal People. The
 8 EIS will describe the consultation and involvement processes with the Keeyask Cree
 9 Nations (KCN), other First Nations, and Metis related to the environmental assessment.

10 The Public Involvement Plan is described as applying to “Potentially affected Aboriginal
 11 people”, but not to the four “in-vicinity” First Nations (the KCNs). It defines “Potentially
 12 affected Aboriginal people” as “Beyond the in-vicinity First Nations, other Aboriginal
 13 people (First Nation, Metis, and Inuit people) who may be affected by the Project...”
 14 (Public Involvement SV, Appendix 1A, p. 1A-7).

15 There is therefore a distinction between Métis and First Nations who reside in the same
 16 communities in the Local Study Area, with the KCNs defined as “in-vicinity” to the
 17 project while the Métis are not. Original Question: How would the Métis have been
 18 engaged differently by Manitoba Hydro if they were defined and considered as “in-
 19 vicinity”, particularly those Métis residing in communities and using land in the Local
 20 Study Area?

21 **FOLLOW-UP QUESTION:**

22 The Partnership does not wholly explain how the Métis would have been engaged
 23 differently had they been considered “in-vicinity”, equivalent to the KCNs. The
 24 Partnership provides an overview of opportunities for the Métis to participate in the
 25 Public Involvement Program. No further questions at this time.

26 **RESPONSE:**

27 No response required.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section:**
 2 **6.2.3.5.2 Economy; Page No.: 6-144**

3 **CEC Rd 2 MMF-0066a**

4 **ORIGINAL PREAMBLE AND QUESTION (MMF-0027a):**

5 EIS Scoping Document Reference: 4.2.1 – Economy: “The EIS will describe... ..The
 6 regional economy, in particular local Aboriginal and non-Aboriginal communities and
 7 the regional centre, with an emphasis on the labour force, employment, unemployment,
 8 income, and education and training, and with a profile of local business capacity (e.g.,
 9 goods and services).”

10 5.1 – Project Effects: “Based on the description of the Project... ..and the existing
 11 environment... ..the EIS will identify the effects of the Project on the environment...”
 12 The EIS presents information on the levels of educational attainment for the KCNs
 13 Members, the Town of Gillam, and the City of Thompson in the Local Study Area. It also
 14 presents this information for northern Aboriginal residents, comparing it to educational
 15 levels in the Regional Study Area (R to EIS, Section 6.2.3.5.2, p. 6-144).

16 It does not present information on the levels of educational attainment of the Métis
 17 population in the Local Study Area and Regional Study Area. This information would be
 18 useful for determining the potential Métis labour force, and would be necessary to
 19 measure changes in the levels of education for Métis in the Local and Regional Study
 20 Areas, particularly if these changes are to be attributed to the Project.

- 21 • Provide information on the current levels of educational attainment of the Métis
 22 population in the Local Study Area communities.
 23 • Provide information on the levels of educational attainment of the Métis population
 24 in the Regional Study Area communities.

25 **FOLLOW-UP QUESTION:**

- 26 • Through completion of the studies (the Métis-specific Traditional Land Use and
 27 Knowledge Study (TLUKS), Socio-economic Impact Assessment and historical
 28 narrative for the Keeyask region) will Métis-specific baseline data be gathered and
 29 documented, including information regarding current levels of educational
 30 attainment for Métis in the Local Study Area?
 31 • Will the results of the Métis-specific Traditional Land Use and Knowledge Study
 32 (TLUKS), Socio-economic Impact Assessment and historical narrative for the Keeyask
 33 region be used to identify potential adverse as well as positive impacts of the
 34 project to the Métis in the Local Study Area? If yes, please explain how (i.e. by what
 35 process).

36 · If new/additional impacts are identified through the above studies, will the
 37 Partnership identify new mitigation measures, revise existing mitigation measures
 38 as necessary, and also negotiate an agreement regarding the mitigation of Project
 39 impacts on the Métis?

40 **RESPONSE:**

41 Each of the above questions is answered in turn.

42 *Through completion of the studies (the Métis-specific Traditional Land Use and*
 43 *Knowledge Study (TLUKS), Socio-economic Impact Assessment and historical narrative*
 44 *for the Keeyask region) will Métis-specific baseline data be gathered and documented,*
 45 *including information regarding current levels of educational attainment for Métis in the*
 46 *Local Study Area?*

47 The referenced studies are being undertaken and led by the MMF. Through the socio-
 48 economic impact assessment, the MMF has indicated that it will collect and document
 49 socio-economic characteristics of, and determine what it believes are the potential
 50 effects of Keeyask on, the Metis community that live within and rely on the Local,
 51 Regional and Manitoba socio-economic study areas identified in the Keeyask
 52 Environmental Impact Statement. This could include documentation of Metis-specific
 53 baseline data related to current levels of educational attainment for Metis in the Local
 54 Study Area, if the MMF feels this is relevant.

55 *Will the results of the Métis-specific Traditional Land Use and Knowledge Study (TLUKS),*
 56 *Socio-economic Impact Assessment and historical narrative for the Keeyask region be*
 57 *used to identify potential adverse as well as positive impacts of the project to the Métis*
 58 *in the Local Study Area? If yes, please explain how (i.e. by what process).*

59 As noted in the response above, the MMF-led socio-economic impact assessment is
 60 intended to determine what the MMF believes are the potential effects of Keeyask on
 61 the Metis community that live within and rely on the Local, Regional and Manitoba
 62 socio-economic study areas identified in the Keeyask Environmental Impact Statement.
 63 The Partnership anticipates that this would include an assessment of both the potential
 64 positive and adverse impacts of the Project to the Metis in the Local Study Area. The
 65 processes for undertaking this assessment are being determined by the MMF.

66 *If new/additional impacts are identified through the above studies, will the Partnership*
 67 *identify new mitigation measures, revise existing mitigation measures as necessary, and*
 68 *also negotiate an agreement regarding the mitigation of Project impacts on the Métis?*

69 The Partnership remains committed to considering any additional information provided
 70 through these studies. The Partnership is committed to further dialogue with the MMF

- 71 so that it can determine how best to incorporate this new information into planning and
72 development processes for the Keeyask Generation Project, once it is available.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section:**
2 **6.2.3.5.2 Economy; Page No.: 6-144**

3 **CEC Rd 2 MMF-0066b**

4 **ORIGINAL PREAMBLE AND QUESTION (MMF-0027b):**

5 EIS Scoping Document Reference: 4.2.1 – Economy: “The EIS will describe... ..The
6 regional economy, in particular local Aboriginal and non-Aboriginal communities and
7 the regional centre, with an emphasis on the labour force, employment, unemployment,
8 income, and education and training, and with a profile of local business capacity (e.g.,
9 goods and services).”

10 5.1 – Project Effects: “Based on the description of the Project... ..and the existing
11 environment... ..the EIS will identify the effects of the Project on the environment...”
12 The EIS presents information on the levels of educational attainment for the KCNs
13 Members, the Town of Gillam, and the City of Thompson in the Local Study Area. It also
14 presents this information for northern Aboriginal residents, comparing it to educational
15 levels in the Regional Study Area (R to EIS, Section 6.2.3.5.2, p. 6-144).

16 It does not present information on the levels of educational attainment of the Métis
17 population in the Local Study Area and Regional Study Area. This information would be
18 useful for determining the potential Métis labour force, and would be necessary to
19 measure changes in the levels of education for Métis in the Local and Regional Study
20 Areas, particularly if these changes are to be attributed to the Project.

21 • Provide information on the levels of educational attainment of the Métis population
22 in the Regional Study Area communities.

23 **FOLLOW-UP QUESTION:**

24 See information requests under CEC Rd 1 MMF-0027a [CEC Rd 2 MMF-0066a].

25 **RESPONSE:**

26 Please see response to CEC Rd 2 MMF-0066a.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section:**
 2 **6.2.3.5.2 Economy; Page No.: 6-145, 6-146**

3 **CEC Rd 2 MMF-0067a**

4 **ORIGINAL PREAMBLE AND QUESTION (MMF-0028a):**

5 EIS Scoping Document Reference: 4.2.1 – Economy: “The EIS will describe... ..The
 6 regional economy, in particular local Aboriginal and non-Aboriginal communities and
 7 the regional centre, with an emphasis on the labour force, employment, unemployment,
 8 income, and education and training, and with a profile of local business capacity (e.g.,
 9 goods and services).”

10 5.1 – Project Effects: “Based on the description of the Project... ..and the existing
 11 environment... ..the EIS will identify the effects of the Project on the environment...”
 12 The Proponent produced an inventory of skills pertinent to Project construction
 13 employment to complement the Statistics Canada information that was gathered. For
 14 the KCNs, “...this provides a more direct estimate of individuals who may be qualified for
 15 Project construction jobs” (R to EIS, Section 6.2.3.5.2, p. 6-145). The EIS (Table 6-12)
 16 presents estimates of the number of KCNs Members with relevant skills according to
 17 broad job categories required for Project construction, for the years 2014 (construction
 18 start) and 2021 (construction end) (R to EIS, Section 6.2.3.5.2, p. 6-146).

19 The EIS does not provide the equivalent information for the Métis population in the
 20 Local Study Area and the Regional Study Area. This information would be useful for
 21 determining the potential Métis labour force, and would be necessary to measure
 22 changes in the skill levels and employability of Métis in the Local and Regional Study
 23 Areas, particularly if these changes are to be attributed to the Project.

- 24 · Provide information on the current (i.e. 2014, construction start) levels of skills by
 25 occupational category for the Métis population in the Local Study Area communities
 26 and Regional Study Area.

27 **FOLLOW-UP QUESTION:**

- 28 · Will the Métis-specific Traditional Land Use and Knowledge Study (TLUKS), Socio-
 29 economic Impact Assessment and historical narrative for the Keeyask region be
 30 used to gather and document Métis-specific baseline data, including information on
 31 the potential labour force, as well as current levels of skills by occupational category
 32 for the Métis population in the Local and Regional Study Areas?
 33 · Will the results of the Métis-specific Traditional Land Use and Knowledge Study
 34 (TLUKS), Socio-economic Impact Assessment and historical narrative for the Keeyask
 35 region be used to identify potential adverse as well as positive impacts of the

- 36 project to the Métis in the Local and Regional Study Areas, including Métis
 37 participation in Project employment? If yes, please explain how (i.e. by what
 38 process).
- 39 · If new/additional impacts are identified through the above studies, will the
 40 Partnership identify new mitigation measures and revise existing mitigation
 41 measures as necessary, including measures designed to enhance positive effects,
 42 such as those directed at increasing participation in Project employment?
 - 43 · Will Métis employment, including by occupational category, be monitored as part of
 44 the SEMP?

45 **RESPONSE:**

46 A response to each of the above questions is provided below.

47 *Will the Métis-specific Traditional Land Use and Knowledge Study (TLUKS), Socio-*
 48 *economic Impact Assessment and historical narrative for the Keeyask region be used to*
 49 *gather and document Métis-specific baseline data, including information on the*
 50 *potential labour force, as well as current levels of skills by occupational category for the*
 51 *Métis population in the Local and Regional Study Areas?*

52 The referenced studies are being undertaken and led by the MMF. Through the socio-
 53 economic impact assessment, the MMF has indicated that it will collect and document
 54 socio-economic characteristics of, and determine what it believes are the potential
 55 effects of Keeyask on, the Metis community that live within and rely on the Local,
 56 Regional and Manitoba socio-economic study areas identified in the Keeyask
 57 Environmental Impact Statement. It is the Partnership's understanding that this will
 58 include information on the potential Metis labour force, so could include current levels
 59 of skills by occupational category for Metis in the Local and Regional Study Areas, if the
 60 MMF feels this is relevant.

61 *Will the results of the Métis-specific Traditional Land Use and Knowledge Study (TLUKS),*
 62 *Socio-economic Impact Assessment and historical narrative for the Keeyask region be*
 63 *used to identify potential adverse as well as positive impacts of the project to the Métis*
 64 *in the Local and Regional Study Areas, including Métis participation in Project*
 65 *employment? If yes, please explain how (i.e. by what process).*

66 As noted in the response above, the MMF-led socio-economic impact assessment is
 67 intended to determine what the MMF believe are the potential effects of Keeyask on
 68 the Metis community that live within and rely on the Local, Regional and Manitoba
 69 socio-economic study areas identified in the Keeyask Environmental Impact Statement.
 70 This could include an assessment of both the potential positive and adverse impacts of
 71 the Project to the Metis in the Local and Regional Study Areas, including possible

72 participation in Project employment. The processes for undertaking this assessment are
73 being determined by the MMF.

74 *If new/additional impacts are identified through the above studies, will the Partnership*
75 *identify new mitigation measures and revise existing mitigation measures as necessary,*
76 *including measures designed to enhance positive effects, such as those directed at*
77 *increasing participation in Project employment?*

78 The Partnership remains committed to considering any additional information provided
79 through these studies. The Partnership is committed to further dialogue with the MMF
80 so that it can determine how best to incorporate this new information into planning and
81 development processes for the Keeyask Generation Project, once it is available.

82 *Will Métis employment, including by occupational category, be monitored as part of the*
83 *SEMP?*

84 Metis employment associated with Keeyask will be monitored during both construction
85 and operation, on the basis of self-declarations made by individuals. During the
86 construction period, this information will be posted on the Partnership's Website, to the
87 extent feasible so as not to violate personal confidentiality.

88 Construction employment monitoring will consider:

- 89 • Total construction opportunities available including the amount (e.g., total person-
90 years);
- 91 • Occupational classification of available opportunities; and
- 92 • Number of hires and total number of employees.

93 Data will also be collected regularly on:

- 94 • Trainee status by on-site contractors and Manitoba Hydro, including information on
95 trainee participation in HNTel pre-Project training, trainee designation and
96 apprenticeship level at the point of hire, at the point of separation and at any point
97 during employment when reclassification occurs; and
- 98 • Factors associated with availability of workers and job qualification in a manner
99 similar to construction of the Wuskwatim Generation Project.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section:**
 2 **6.2.3.5.2 Economy; Page No.: 6-145, 6-146**

3 **CEC Rd 2 MMF-0067b**

4 **ORIGINAL PREAMBLE AND QUESTION (MMF-0067b):**

5 EIS Scoping Document Reference: 4.2.1 – Economy: “The EIS will describe... ..The
 6 regional economy, in particular local Aboriginal and non-Aboriginal communities and
 7 the regional centre, with an emphasis on the labour force, employment, unemployment,
 8 income, and education and training, and with a profile of local business capacity (e.g.,
 9 goods and services).”

10 5.1 – Project Effects: “Based on the description of the Project... ..and the existing
 11 environment... ..the EIS will identify the effects of the Project on the environment...”
 12 The Proponent produced an inventory of skills pertinent to Project construction
 13 employment to complement the Statistics Canada information that was gathered. For
 14 the KCNs, “...this provides a more direct estimate of individuals who may be qualified for
 15 Project construction jobs” (R to EIS, Section 6.2.3.5.2, p. 6-145). The EIS (Table 6-12)
 16 presents estimates of the number of KCNs Members with relevant skills according to
 17 broad job categories required for Project construction, for the years 2014 (construction
 18 start) and 2021 (construction end) (R to EIS, Section 6.2.3.5.2, p. 6-146).

19 The EIS does not provide the equivalent information for the Métis population in the
 20 Local Study Area and the Regional Study Area. This information would be useful for
 21 determining the potential Métis labour force, and would be necessary to measure
 22 changes in the skill levels and employability of Métis in the Local and Regional Study
 23 Areas, particularly if these changes are to be attributed to the Project.

24 · Provide information on the estimated levels of skills by occupational category for
 25 the Métis population in the Local Study Area communities and Regional Study Area
 26 in 2021 (construction end).

27 **FOLLOW-UP QUESTION:**

28 Please see Information Requests in CEC Rd 1 MMF-0028a [CEC Rd 2 MMF-0067a].

29 **RESPONSE:**

30 No response required; see CEC Rd 2 MMF-0067a for a response related to levels of skills
 31 by occupational category.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section:**
2 **6.2.3.5.2 Economy (R to EIS); 3.3.1.1 Pre-Project Training - Hydro**
3 **Northern Training and Employment Initiative (SE SV); Page No.: 6-**
4 **140 (R to EIS); Table 3-2, p. 3-20 (SE SV)**

5 **CEC Rd 2 MMF-0068a**

6 **ORIGINAL PREAMBLE AND QUESTION (MMF-0029a):**

7 EIS Scoping Document Reference: 4.2.1 – Economy: “The EIS will describe... ..The
8 regional economy, in particular local Aboriginal and non-Aboriginal communities and
9 the regional centre, with an emphasis on the labour force, employment, unemployment,
10 income, and education and training, and with a profile of local business capacity (e.g.,
11 goods and services).”

12 5.1 – Project Effects: “Based on the description of the Project... ..and the existing
13 environment... ..the EIS will identify the effects of the Project on the environment...”
14 The EIS describes the Hydro Northern Training and Employment Initiative (HNTEI) as a
15 pre-project training initiative, implemented to prepare Aboriginal northerners to
16 participate in the construction employment and business opportunities available from
17 northern hydroelectric development, including the Keeyask Projects (R to EIS, Section
18 6.2.3.5.2, p. 6-140). Ninety-one members of the MMF are reported to have completed
19 courses or programs (2009, 2010) (Socio-economic SV, Table 3-2, p. 3-20).

- 20 · Provide information regarding the level of Métis enrollment in this initiative to
21 compare to the numbers of course and program completions.
22 · Provide information regarding the employment of Métis participants following
23 completion of the courses and programs, as well as the number of Métis estimated
24 to be employed on the Keeyask Project as a result of participation in this initiative.

25 **FOLLOW-UP QUESTION:**

26 Information request satisfied. The Partnership provides the level of Métis enrollment
27 and participation in the HNTEI.

28 **RESPONSE:**

29 No response required.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section:**
 2 **6.2.3.5.2 Economy (R to EIS); 3.3.1.1 Pre-Project Training - Hydro**
 3 **Northern Training and Employment Initiative (SE SV) ; Page No.:**
 4 **6-140 (R to EIS); Table 3-2, p. 3-20 (SE SV)**

5 **CEC Rd 2 MMF-0068b**

6 **ORIGINAL PREAMBLE AND QUESTION (MMF-0068b):**

7 EIS Scoping Document Reference: 4.2.1 – Economy: “The EIS will describe... ..The
 8 regional economy, in particular local Aboriginal and non-Aboriginal communities and
 9 the regional centre, with an emphasis on the labour force, employment, unemployment,
 10 income, and education and training, and with a profile of local business capacity (e.g.,
 11 goods and services).”

12 5.1 – Project Effects: “Based on the description of the Project... ..and the existing
 13 environment... ..the EIS will identify the effects of the Project on the environment...”
 14 The EIS describes the Hydro Northern Training and Employment Initiative (HNTEI) as a
 15 pre-project training initiative, implemented to prepare Aboriginal northerners to
 16 participate in the construction employment and business opportunities available from
 17 northern hydroelectric development, including the Keeyask Projects (R to EIS, Section
 18 6.2.3.5.2, p. 6-140). Ninety-one members of the MMF are reported to have completed
 19 courses or programs (2009, 2010) (Socio-economic SV, Table 3-2, p. 3-20).

20 Provide information regarding the employment of Métis participants following
 21 completion of the courses and programs, as well as the number of Métis estimated to
 22 be employed on the Keeyask Project as a result of participation in this initiative.

23 **FOLLOW-UP QUESTION:**

24 The Partnership provides information regarding the employment of Métis participants
 25 following completion of courses and programs as part of the HNTEI. The Partnership
 26 responds that estimates of Métis participation in Keeyask Project construction
 27 employment are included in the estimate of employment for Aboriginal residents in the
 28 Regional Study Area. Lastly, the Partnership refers to the Career Development
 29 Partnership Program between Manitoba Hydro and the MMF, which aims to have 100
 30 Métis employed in permanent positions by 2014. There are currently 64 Métis
 31 permanently employed through this program.

- 32 • How will Métis employment be monitored without Métis-specific estimates of
 33 participation in Keeyask Project construction employment?
 34 • What efforts could be undertaken by the Partnership to assist in achieving the goal
 35 of 100 Métis permanently employed by Manitoba Hydro by 2014?

36 **RESPONSE:**

37 The monitoring of construction employment on the Keeyask Project, as outlined in the
38 Socio-Economic Monitoring Plan, is an activity overseen by the Partnership. Total
39 construction employment hires will be tracked and data will be broken down by CBN
40 region, Aboriginal, non-Aboriginal, northern, Manitoba and non-Manitoba. Métis
41 employment associated with Keeyask will be monitored during both construction and
42 operation, on the basis of self-declarations made by individuals. During the construction
43 period, this information will be posted on the Partnership's Website, to the extent
44 feasible so as not to violate personal confidentiality.

45 While the establishment and realization of targets associated with the MMF-Hydro
46 Career Development Program (CDP) are outside the scope of the Partnership to address,
47 permanent (operations) positions secured by MMF job seekers through the CDP are
48 tracked. The CDP is an initiative separate and apart from the Keeyask Generation
49 Project and HNTEI. The CDP initiative is aimed at establishing and achieving
50 employment objectives within Manitoba Hydro's operations (as opposed to
51 construction jobs).

52 As noted above, while HNTEI is a separate initiative, training provided through HNTEI
53 could contribute to the skills required to secure employment in Manitoba Hydro's
54 operations. Furthermore, there are several measures that assist in achieving the goal of
55 100 Metis permanently employed by Manitoba Hydro by 2014. Through the established
56 MMF – Hydro Employment Working Group, recruitment staff from both Manitoba
57 Hydro and the MMF meet on a regular basis to exchange information about Hydro
58 employment opportunities, major recruitments and educational funding for post-
59 secondary students, as well as the MMF's education and training initiatives. The intent is
60 to match MMF referred job seekers and students to Hydro employment through the
61 Referral Process. MMF employment counselors assist clients who have expressed an
62 interest in employment with Manitoba Hydro by helping them gain the requisite
63 education and experience and assisting them in the application, testing and interview
64 processes. Referral letters from these clients accompany the applications so that Hydro
65 staff who undertake the hiring understand that these are clients who are coming
66 through the CDP. The MMF referrals have been successful both in major recruitments,
67 as well as individual job postings. The MMF receives all external job postings so that
68 they can search their existing database for clients meeting the qualifications.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section:**
 2 **6.2.3.5.2 Economy; Page No.: 6-141, 6-142**

3 **CEC Rd 2 MMF-0069a**

4 **ORIGINAL PREAMBLE AND QUESTION (MMF-0030a):**

5 EIS Scoping Document Reference: 4.2.1 – Economy: “The EIS will describe... ..The
 6 regional economy, in particular local Aboriginal and non-Aboriginal communities and
 7 the regional centre, with an emphasis on the labour force, employment, unemployment,
 8 income, and education and training, and with a profile of local business capacity (e.g.,
 9 goods and services).”

10 5.1 – Project Effects: “Based on the description of the Project... ..and the existing
 11 environment... ..the EIS will identify the effects of the Project on the environment...”
 12 The EIS presents information on the potential labour force in the KCNs communities, the
 13 Town of Gillam, the City of Thompson, and general labour force information for the
 14 Regional Study Area (R to EIS, Section 6.2.3.5.2, p. 6-142). It does not present
 15 information on the Métis potential labour force in the Local Study Area and Regional
 16 Study Area.

17 To estimate the extent to which KCNs Members and the Regional Study Area Aboriginal
 18 workforce would participate in construction employment opportunities, a labour
 19 supply/demand model was developed (R to EIS, Section 6.6.3.1.1, p. 6-433). It does not
 20 include data on the potential labour force of the Métis, and nor does it provide
 21 information specific to the estimated levels of Métis participation in construction
 22 employment.

23 · Provide information on the potential labour force of the Métis in the Local Study
 24 Area communities, equivalent to the potential labour force information provided for
 25 the KCNs, Gillam, and Thompson.

26 **FOLLOW-UP QUESTION:**

27 · Will the Métis-specific Traditional Land Use and Knowledge Study (TLUKS), Socio-
 28 economic Impact Assessment and historical narrative for the Keeyask region be
 29 used to gather and document Métis-specific baseline data, including potential
 30 labour force data, for the Métis population in the Local Study Area?
 31 · Will the results of the Métis-specific Traditional Land Use and Knowledge Study
 32 (TLUKS), Socio-economic Impact Assessment and historical narrative for the Keeyask
 33 region be used to identify potential adverse as well as positive impacts of the
 34 project to the Métis in the Local Study Area, including participation of the Métis
 35 labour force in Project employment?

- 36 · If new/additional impacts are identified through the above studies, will the
37 Partnership identify new mitigation measures and revise existing mitigation
38 measures, including measures designed to enhance positive effects, such as those
39 directed at increasing participation of the Métis labour force located in the Local
40 Study Area?
41 · Will Métis labour force participation rates in Project employment be monitored as
42 part of the SEMP?

43 **RESPONSE:**

44 Responses to each of the above are answered below.

45 *Will the Métis-specific Traditional Land Use and Knowledge Study (TLUKS), Socio-*
46 *economic Impact Assessment and historical narrative for the Keeyask region be used to*
47 *gather and document Métis-specific baseline data, including potential labour force data,*
48 *for the Métis population in the Local Study Area?*

49 Please see the response to CEC Rd 2 MMF-0067a.

50 *Will the results of the Métis-specific Traditional Land Use and Knowledge Study (TLUKS),*
51 *Socio-economic Impact Assessment and historical narrative for the Keeyask region be*
52 *used to identify potential adverse as well as positive impacts of the project to the Métis*
53 *in the Local Study Area, including participation of the Métis labour force in Project*
54 *employment?*

55 Please see the response to CEC Rd 2 MMF-0067a.

56 *If new/additional impacts are identified through the above studies, will the Partnership*
57 *identify new mitigation measures and revise existing mitigation measures, including*
58 *measures designed to enhance positive effects, such as those directed at increasing*
59 *participation of the Métis labour force located in the Local Study Area?*

60 Please see the response to CEC Rd 2 MMF-0067a.

61 *Will Métis labour force participation rates in Project employment be monitored as part*
62 *of the SEMP?*

63 As noted in the response to CEC Rd 2 MMF-0067a, Metis employment associated with
64 Keeyask will be monitored during both construction and operation, on the basis of self-
65 declarations made by individuals. During the construction period, this information will
66 be posted on the Partnership's Website, to the extent feasible so as not to violate
67 personal confidentiality.

68 Employment construction monitoring will focus on:

- 69 · Total construction opportunities available including the amount (*e.g.*, total person-
70 years);
- 71 · Occupational classification of available opportunities; and
- 72 · Number of hires and total number of employees.

73 Data will also be collected regularly on:

- 74 · Trainee status by on-site contractors and Manitoba Hydro, including information on
75 trainee participation in HNTEI pre-Project training, trainee designation and
76 apprenticeship level at the point of hire, at the point of separation and at any point
77 during employment when reclassification occurs; and
- 78 · Factors associated with availability of workers and job qualification in a manner
79 similar to construction of the Wuskwatim Generation Project.

80 Labour force participation rates in the Project, for the Metis or other parties, will not be
81 directly monitored.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section:**
 2 **6.2.3.5.2 Economy; Page No.: 6-141, 6-142**

3 **CEC Rd 2 MMF-0069b**

4 **ORIGINAL PREAMBLE AND QUESTION (MMF-0030b):**

5 EIS Scoping Document Reference: 4.2.1 – Economy: “The EIS will describe... ..The
 6 regional economy, in particular local Aboriginal and non-Aboriginal communities and
 7 the regional centre, with an emphasis on the labour force, employment, unemployment,
 8 income, and education and training, and with a profile of local business capacity (e.g.,
 9 goods and services).”

10 5.1 – Project Effects: “Based on the description of the Project... ..and the existing
 11 environment... ..the EIS will identify the effects of the Project on the environment...”
 12 The EIS presents information on the potential labour force in the KCNs communities, the
 13 Town of Gillam, the City of Thompson, and general labour force information for the
 14 Regional Study Area (R to EIS, Section 6.2.3.5.2, p. 6-142). It does not present
 15 information on the Métis potential labour force in the Local Study Area and Regional
 16 Study Area.

17 To estimate the extent to which KCNs Members and the Regional Study Area Aboriginal
 18 workforce would participate in construction employment opportunities, a labour
 19 supply/demand model was developed (R to EIS, Section 6.6.3.1.1, p. 6-433). It does not
 20 include data on the potential labour force of the Métis, and nor does it provide
 21 information specific to the estimated levels of Métis participation in construction
 22 employment.

23 1. Provide information on the potential labour force of the Métis in the Regional Study
 24 Area.

25 **FOLLOW-UP QUESTION:**

- 26 · Will the Métis-specific Traditional Land Use and Knowledge Study (TLUKS), Socio-
 27 economic Impact Assessment and historical narrative for the Keeyask region be
 28 used to gather and document Métis-specific baseline data, including potential
 29 labour force data, for the Métis population in the Regional Study Area?
- 30 · Will the results of the Métis-specific Traditional Land Use and Knowledge Study
 31 (TLUKS), Socio-economic Impact Assessment and historical narrative for the Keeyask
 32 region be used to identify potential adverse as well as positive impacts of the
 33 project to the Métis in the Regional Study Area, including participation of the Métis
 34 labour force in Project employment?

- 35 · If new/additional impacts are identified through the above studies, will the
36 Partnership identify new mitigation measures and revise existing mitigation
37 measures, including measures designed to enhance positive effects, such as those
38 directed at increasing participation of the Métis labour force located in the Regional
39 Study Area?
- 40 · Will Métis labour force participation rates in Project employment be monitored as
41 part of the SEMP?

42 **RESPONSE:**

43 Please see the responses to CEC Rd 2 MMF-0067a and MMF-0069a.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 6.6.3**
 2 **Economy (R to EIS); 3.0 Economy (SE SV); Page No.: 6-434, 6-435**
 3 **(R to EIS); 3-98, 3-125 (SE SV)**

4 **CEC Rd 2 MMF-0070a**

5 **ORIGINAL PREAMBLE AND QUESTION (MMF-0031a):**

6 EIS Scoping Document Reference: 4.2.1 – Economy: “The EIS will describe... ..The
 7 regional economy, in particular local Aboriginal and non-Aboriginal communities and
 8 the regional centre, with an emphasis on the labour force, employment, unemployment,
 9 income, and education and training, and with a profile of local business capacity (e.g.,
 10 goods and services).”

11 5.1 – Project Effects: “Based on the description of the Project... ..and the existing
 12 environment... ..the EIS will identify the effects of the Project on the environment...”
 13 The EIS states that the Project is expected to generate “...an estimated 235 to 600
 14 person years of construction employment for KCNs Members, which equates to 6-14%
 15 of the total construction workforce” (R to EIS, Section 6.6.3, p. 6-434). During
 16 construction, the JKDA includes an employment target of 630 person-years of
 17 employment for the KCNs. The target includes their participation in construction of the
 18 Keeyask Generation Project as well as their participation in employment opportunities
 19 associated with the Keeyask Infrastructure Project (R to EIS, Section 6.2.3.5.2, p. 6-435;
 20 Socio-economic SV, Section 3, p. 3-98). With regard to “Aboriginal workers from the
 21 Regional Study Area” the EIS states that the Project “is expected to provide substantial
 22 construction employment... ..ranging from an estimated 550 to 1,700 person years. At
 23 these levels, between 13% and 40% of total construction employment would be filled by
 24 Aboriginal workers from the Regional Study Area” (R to EIS, Section 6.6.3, p. 6-435).

25 Commitments in the JKDA also include 20-year targets for employment of KCNs
 26 Members during operations with Manitoba Hydro, across Manitoba Hydro’s entire
 27 system, not just for the Keeyask Generation Project. The target level of employment for
 28 all four KCNs is 182 jobs, with 100 jobs for TCN Members, 10 for WLFN Members, 36 for
 29 YFFN Members, and 36 for FLCN Members by 2029 (Socio-economic SV, Section 3, p. 3-
 30 125). The EIS distinguishes between the KCNs, Gillam, and Thompson in the Local Study
 31 Area, and Aboriginal workers from the Regional Study Area (which includes the KCNs). In
 32 doing so, it does not include specific information on estimated levels of employment of
 33 Métis in the Local Study Area and the Regional Study Area during construction and
 34 operations.

- 35 . Provide information on the estimated (or anticipated) levels of employment for the
 36 Métis as follows:
- 37 ○ What is the estimated level of construction employment for Métis in the
 38 Local Study Area?
 - 39 ○ What is the estimated level of construction employment for Métis in the
 40 Regional Study Area?
 - 41 ○ What is the estimated level of operations employment for Métis in the Local
 42 Study Area?
 - 43 ○ What is the estimated level of operations employment for Métis in the
 44 Regional Study Area?

45 **FOLLOW-UP QUESTION:**

46 The Partnership provides information regarding estimated construction and operations
 47 employment for the Local and Regional Study Areas, and states that the Métis are
 48 included in the estimates provided.

- 49 1. Will the Métis-specific Traditional Land Use and Knowledge Study (TLUKS), Socio-
 50 economic Impact Assessment and historical narrative for the Keeyask region be
 51 used to gather and document Métis-specific baseline data, including potential
 52 labour force data, for the Métis population in the Local Study Area?
- 53 2. Will the results of the Métis-specific Traditional Land Use and Knowledge Study
 54 (TLUKS), Socio-economic Impact Assessment and historical narrative for the Keeyask
 55 region be used to identify estimated levels of construction and operations
 56 employment for the Métis, for both the Local and Regional Study Areas?
- 57 3. If new/additional impacts are identified through the above studies, will the
 58 Partnership identify new mitigation measures and revise existing mitigation
 59 measures, including measures designed to enhance positive effects, such as those
 60 directed at increasing participation of the Métis labour force?
- 61 4. Will rates of participation in Project employment by the Métis be monitored as part
 62 of the SEMP?

63 **RESPONSE:**

64 Please see the responses to similar questions posed in CEC Rd 2 MMF-0067a.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 6.6.3**
 2 **Economy (R to EIS); 3.0 Economy (SE SV) ; Page No.: 6-434, 6-435**
 3 **(R to EIS); 3-98, 3-125 (SE SV)**

4 **CEC Rd 2 MMF-0070b**

5 **ORIGINAL PREAMBLE AND QUESTION (MMF-0070b):**

6 EIS Scoping Document Reference: 4.2.1 – Economy: “The EIS will describe... ..The
 7 regional economy, in particular local Aboriginal and non-Aboriginal communities and
 8 the regional centre, with an emphasis on the labour force, employment, unemployment,
 9 income, and education and training, and with a profile of local business capacity (e.g.,
 10 goods and services).”

11 5.1 – Project Effects: “Based on the description of the Project... ..and the existing
 12 environment... ..the EIS will identify the effects of the Project on the environment...”
 13 The EIS presents information on the potential labour force in the KCNs communities, the
 14 Town of Gillam, the City of Thompson, and general labour force information for the
 15 Regional Study Area (R to EIS, Section 6.2.3.5.2, p. 6-142). It does not present
 16 information on the Métis potential labour force in the Local Study Area and Regional
 17 Study Area.

18 To estimate the extent to which KCNs Members and the Regional Study Area Aboriginal
 19 workforce would participate in construction employment opportunities, a labour
 20 supply/demand model was developed (R to EIS, Section 6.6.3.1.1, p. 6-433). It does not
 21 include data on the potential labour force of the Métis, and nor does it provide
 22 information specific to the estimated levels of Métis participation in construction
 23 employment.

24 • Why are no targets established for Métis participation in construction and
 25 operations employment?

26 **FOLLOW-UP QUESTION:**

27 The Partnership differentiates between the JKDA (which sets employment targets for
 28 the KCNs) and the EIS (which does not set employment targets) to explain why no
 29 targets are established for Metis participation in construction and operations
 30 employment, and also refers to the Career Development Partnership Program (see CEC
 31 Rd 1 MMF-0029). No further questions at this time.

32 **RESPONSE:**

33 No response required.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section:**
2 **6.6.4.1.1 Population; Page No.: 6-450**

3 **CEC Rd 2 MMF-0071a**

4 **ORIGINAL PREAMBLE AND QUESTION (MMF-0032a):**

5 EIS Scoping Document Reference: 4.2.1 – Economy: “The EIS will describe... ..The
6 regional economy, in particular local Aboriginal and non-Aboriginal communities and
7 the regional centre, with an emphasis on the labour force, employment, unemployment,
8 income, and education and training, and with a profile of local business capacity (e.g.,
9 goods and services).”

10 5.1 – Project Effects: “Based on the description of the Project... ..and the existing
11 environment... ..the EIS will identify the effects of the Project on the environment...”
12 The EIS states that KCNs Members would qualify for Project hiring preferences
13 “...regardless of their home address within the province of Manitoba...” (R to EIS,
14 Section 6.6.4.1.1, p. 6-450) and as such, would not need to move to communities in the
15 Local Study Area. This measure is intended to address potential in-migration to, and
16 crowding in, the Local Study Area communities; however, it has implications for the
17 Métis in terms of hiring preferences.

- 18 · Confirm whether KCN Members residing outside of the Local Study Area will be
19 given employment preference to equally qualified Métis residing within the Local
20 Study Area.

21 **FOLLOW-UP QUESTION:**

22 The Partnership states that, for open-tendered contracts, KCN members residing in
23 Manitoba and Métis residing in the Regional Study Area fall within the same first hiring
24 preference, and will be selected on the basis of their qualifications.

- 25 · Will a Direct Negotiation Contract (DNC) be signed between Manitoba Hydro/the
26 Partnership and MMF, entitling MMF to give first preference to its own members?

27 **RESPONSE:**

28 An objective of the Partnership is to expand the number, capacity, diversity and viability
29 of KCN businesses. To achieve this objective, Direct Negotiation Contracts (DNCs) are a
30 provision of the JKDA for the KCN Partners. There will be no additional DNCs with
31 anyone else.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section:**
2 **6.6.4.1.1 Population; Page No.: 6-450**

3 **CEC Rd 2 MMF-0071b**

4 **ORIGINAL PREAMBLE AND QUESTION (MMF-0032b):**

5 EIS Scoping Document Reference: 4.2.1 – Economy: “The EIS will describe... ..The
6 regional economy, in particular local Aboriginal and non-Aboriginal communities and
7 the regional centre, with an emphasis on the labour force, employment, unemployment,
8 income, and education and training, and with a profile of local business capacity (e.g.,
9 goods and services).”

10 5.1 – Project Effects: “Based on the description of the Project... ..and the existing
11 environment... ..the EIS will identify the effects of the Project on the environment...”
12 The EIS states that KCNs Members would qualify for Project hiring preferences
13 “...regardless of their home address within the province of Manitoba...” (R to EIS,
14 Section 6.6.4.1.1, p. 6-450) and as such, would not need to move to communities in the
15 Local Study Area. This measure is intended to address potential in-migration to, and
16 crowding in, the Local Study Area communities; however, it has implications for the
17 Métis in terms of hiring preferences.

18 • If employment preference is given to KCN Members, provide a rationale for this
19 provision.

20 **FOLLOW-UP QUESTION:**

21 No further questions at this time.

22 **RESPONSE:**

23 No response required.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section:**
 2 **6.2.3.5.2 Economy, 6.6.3.2 Business Opportunities; Page No.: 6-**
 3 **146, 6-438 - 6-442**

4 **CEC Rd 2 MMF-0072a**

5 **ORIGINAL PREAMBLE AND QUESTION (MMF-0033a):**

6 EIS Scoping Document Reference: 4.2.1 – Economy: “The EIS will describe... ..The
 7 regional economy, in particular local Aboriginal and non-Aboriginal communities and
 8 the regional centre, with an emphasis on the labour force, employment, unemployment,
 9 income, and education and training, and with a profile of local business capacity (e.g.,
 10 goods and services).”

11 5.1 – Project Effects: “Based on the description of the Project... ..and the existing
 12 environment... ..the EIS will identify the effects of the Project on the environment...”
 13 The EIS presents information about the capacity of existing businesses to participate in
 14 opportunities that may arise from the Project, and states that “KCNs businesses are of
 15 particular interest given the direct negotiated contracts (DNCs) that will be made
 16 available to them as a result of the JKDA” (R to EIS, Section 6.2.3.5.2, p. 6-146). It
 17 provides a description of the range of KCNs Members’ businesses with the potential for
 18 participating in Keeyask-related contracts, and then describes the capacity of Gillam and
 19 Thompson to supply needed services to the Project (R to EIS, Section 6.2.3.5.2, p.6-146).
 20 The EIS concludes that “...the majority of business opportunities in the Local Study Area
 21 are expected to flow to the KCNs through DNCs” (R to EIS, Section 6.6.3.2, p. 6-439) and
 22 further, that “Business effects in the Regional Study Area are expected to be minimal in
 23 comparison to communities in the Local Study Area.” (R to EIS, Section 6.6.3.2, p. 6-
 24 438).

25 It is not apparent whether any efforts were undertaken to determine the presence and
 26 capacity of Métis-owned businesses in the Local Study Area communities (i.e. including
 27 in Gillam and in Thompson) and the Regional Study Area. The extent to which Métis-
 28 owned businesses can be anticipated to participate in opportunities that may arise from
 29 the Project is also not known.

30 · Describe the efforts that were undertaken to determine the presence and capacity
 31 of Métis-owned businesses in the Local Study Area communities and the Regional
 32 Study Area that could participate in opportunities to supply services to the Project.

33 **FOLLOW-UP QUESTION:**

34 CEC Rd 1 MMF-0033a: The Partnership distinguishes between opportunities available
35 through Direct Negotiation Contracts (DNC) and an open tender process, and states that
36 Métis vendors would be open to tendering on such work.

- 37 • Will a Direct Negotiation Contract (DNC) be signed between Manitoba Hydro/the
38 Partnership and MMF?
39 • Will the Métis-specific Traditional Land Use and Knowledge Study (TLUKS), Socio-
40 economic Impact Assessment and historical narrative for the Keeyask region be
41 used to gather and document Métis-specific baseline data, including information on
42 potential and existing Métis-owned businesses?

43 **RESPONSE:**

44 A response to each of the questions above is answered in turn.

45 *Will a Direct Negotiation Contract (DNC) be signed between Manitoba Hydro/the*
46 *Partnership and MMF?*

47 Please see response to CEC Rd 2 MMF-0071a.

48 *Will the Métis-specific Traditional Land Use and Knowledge Study (TLUKS), Socio-*
49 *economic Impact Assessment and historical narrative for the Keeyask region be used to*
50 *gather and document Métis-specific baseline data, including information on potential*
51 *and existing Métis-owned businesses?*

52 The referenced studies are being undertaken and led by the MMF. Through the socio-
53 economic impact assessment, the MMF has indicated that it will collect and document
54 socio-economic characteristics of, and determine what it believes are the potential
55 effects of Keeyask on, the Metis community that live within and rely on the Local,
56 Regional and Manitoba socio-economic study areas identified in the Keeyask
57 Environmental Impact Statement. It is the Partnership's understanding that this will
58 include information on Metis-owned businesses.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section:**
 2 **6.2.3.5.2 Economy, 6.6.3.2 Business Opportunities; Page No.: 6-**
 3 **146, 6-438 - 6-442**

4 **CEC Rd 2 MMF-0072b**

5 **ORIGINAL PREAMBLE AND QUESTION (MMF-0033b):**

6 EIS Scoping Document Reference: 4.2.1 – Economy: “The EIS will describe... ..The
 7 regional economy, in particular local Aboriginal and non-Aboriginal communities and
 8 the regional centre, with an emphasis on the labour force, employment, unemployment,
 9 income, and education and training, and with a profile of local business capacity (e.g.,
 10 goods and services).”

11 5.1 – Project Effects: “Based on the description of the Project... ..and the existing
 12 environment... ..the EIS will identify the effects of the Project on the environment...”
 13 The EIS presents information about the capacity of existing businesses to participate in
 14 opportunities that may arise from the Project, and states that “KCNs businesses are of
 15 particular interest given the direct negotiated contracts (DNCs) that will be made
 16 available to them as a result of the JKDA” (R to EIS, Section 6.2.3.5.2, p. 6-146). It
 17 provides a description of the range of KCNs Members’ businesses with the potential for
 18 participating in Keeyask-related contracts, and then describes the capacity of Gillam and
 19 Thompson to supply needed services to the Project (R to EIS, Section 6.2.3.5.2, p.6-146).
 20 The EIS concludes that “...the majority of business opportunities in the Local Study Area
 21 are expected to flow to the KCNs through DNCs” (R to EIS, Section 6.6.3.2, p. 6-439) and
 22 further, that “Business effects in the Regional Study Area are expected to be minimal in
 23 comparison to communities in the Local Study Area.” (R to EIS, Section 6.6.3.2, p. 6-
 24 438).

25 It is not apparent whether any efforts were undertaken to determine the presence and
 26 capacity of Métis-owned businesses in the Local Study Area communities (i.e. including
 27 in Gillam and in Thompson) and the Regional Study Area. The extent to which Métis-
 28 owned businesses can be anticipated to participate in opportunities that may arise from
 29 the Project is also not known.

- 30 · Provide information on the number of Métis-owned businesses in the Local Study
 31 Area communities and the Regional Study Area that provide services needed by the
 32 project, regardless of whether these can be met by existing KCNs Members’
 33 businesses.

34 **FOLLOW-UP QUESTION:**

35 No further questions at this time.

- 36 **RESPONSE:**
- 37 No response required.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section:**
 2 **6.2.3.5.2 Economy, 6.6.3.2 Business Opportunities; Page No.: 6-**
 3 **146, 6-438 - 6-442**

4 **CEC Rd 2 MMF-0072c**

5 **ORIGINAL PREAMBLE AND QUESTION (MMF-0033c):**

6 EIS Scoping Document Reference: 4.2.1 – Economy: “The EIS will describe... ..The
 7 regional economy, in particular local Aboriginal and non-Aboriginal communities and
 8 the regional centre, with an emphasis on the labour force, employment, unemployment,
 9 income, and education and training, and with a profile of local business capacity (e.g.,
 10 goods and services).”

11 5.1 – Project Effects: “Based on the description of the Project... ..and the existing
 12 environment... ..the EIS will identify the effects of the Project on the environment...”
 13 The EIS presents information about the capacity of existing businesses to participate in
 14 opportunities that may arise from the Project, and states that “KCNs businesses are of
 15 particular interest given the direct negotiated contracts (DNCs) that will be made
 16 available to them as a result of the JKDA” (R to EIS, Section 6.2.3.5.2, p. 6-146). It
 17 provides a description of the range of KCNs Members’ businesses with the potential for
 18 participating in Keeyask-related contracts, and then describes the capacity of Gillam and
 19 Thompson to supply needed services to the Project (R to EIS, Section 6.2.3.5.2, p.6-146).
 20 The EIS concludes that “...the majority of business opportunities in the Local Study Area
 21 are expected to flow to the KCNs through DNCs” (R to EIS, Section 6.6.3.2, p. 6-439) and
 22 further, that “Business effects in the Regional Study Area are expected to be minimal in
 23 comparison to communities in the Local Study Area.” (R to EIS, Section 6.6.3.2, p. 6-
 24 438).

25 It is not apparent whether any efforts were undertaken to determine the presence and
 26 capacity of Métis-owned businesses in the Local Study Area communities (i.e. including
 27 in Gillam and in Thompson) and the Regional Study Area. The extent to which Métis-
 28 owned businesses can be anticipated to participate in opportunities that may arise from
 29 the Project is also not known.

30 · Provide an estimate of the extent to which the above-identified Métis-owned
 31 businesses can expect to participate in opportunities that may arise from the
 32 Project.

33 **FOLLOW-UP QUESTION:**

34 No further questions at this time.

- 35 **RESPONSE:**
- 36 No response required.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section:**
 2 **6.2.3.5.3 Population, Infrastructure and Services, 6.6.4.1**
 3 **Population (R to EIS); 4.0 Population, Infrastructure and Services**
 4 **(SE SV) ; Page No.: 6-148 - 6-151, 6-449 - 6-451 (R to EIS); 4-34, 4-**
 5 **97 (SE SV)**

6 **CEC Rd 2 MMF-0073a**

7 **ORIGINAL PREAMBLE AND QUESTION (MMF-0034a):**

8 EIS Scoping Document Reference: 4.2.2 – Population, Infrastructure, and Services: “The
 9 EIS will describe the following attributes in the relevant study area(s): Existing
 10 population distribution and demographics ...”

11 5.1 – Project Effects: “Based on the description of the Project... ..and the existing
 12 environment... ..the EIS will identify the effects of the Project on the environment...” As
 13 stated in the EIS, “Population is a supporting topic that leads to an understanding of
 14 changes to housing, infrastructure and services” (R to EIS, Section 6.6.4.1, p. 6-449).
 15 Using Statistics Canada 2006 Census data, the EIS provides the populations of (1) the
 16 KCNs combined, including both on- and off-reserve Members, (2) Gillam, and (3)
 17 Thompson. The EIS then provides population projections to understand population
 18 growth both with and without the project. The analysis focuses on the Local Study Area;
 19 the Project is not expected to result in population changes in the Regional Study Area (R
 20 to EIS, Section 6.2.3.5.3, p.6-149, p. 6-150; R to EIS, Section 6.6.4.1, p. 6-449, p. 6-450).

21 Forty-five percent of the population of Gillam self-identified as Aboriginal in the 2006
 22 Census (Socio-economic SV, Section 4, p. 4-34), while 72% of the population of the
 23 Regional Study Area is identified as Aboriginal (Socio-economic SV, Section 4, p. 4-97).
 24 The EIS, however, does not present information regarding the Métis population in the
 25 Local Study Area communities, or the distribution of the Métis population in the Local
 26 and Regional Study Areas. This information would enable a better understanding of how
 27 the Métis residing in communities in the Local Study Area might experience impacts as a
 28 result of changes in population. This understanding is particularly critical, as the Métis
 29 are not specifically included in the mitigation and offsetting programs conducted as part
 30 of the Adverse Effect Agreements (AEAs) negotiated between the KCNs and Manitoba
 31 Hydro.

32 · Provide estimates of the Métis population in the Local Study Area, including, specific
 33 communities.

34 **FOLLOW-UP QUESTION:**

- 35 · If the results of the Métis-specific Traditional Land Use and Knowledge Study
36 (TLUKS), Socio-economic Impact Assessment and historical narrative for the Keeyask
37 region present more detailed information regarding the Métis population figures in
38 the Local Study Area, will this information be used to reassess potential impacts on
39 the Métis in the Local Study Area and to identify new mitigation measures or revise
40 existing mitigation measures to address such impacts?

41 **RESPONSE:**

42 The Partnership remains committed to considering any additional information provided
43 through these studies. The Partnership is committed to ongoing dialogue with the MMF
44 so that it can determine how best to incorporate this new information into planning and
45 development processes for the Keeyask Generation Project, once it is available.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section:**
 2 **6.2.3.5.3 Population, Infrastructure and Services, 6.6.4.1**
 3 **Population (R to EIS); 4.0 Population, Infrastructure and Services**
 4 **(SE SV) ; Page No.: 6-148 - 6-151, 6-449 - 6-451 (R to EIS); 4-34, 4-**
 5 **97 (SE SV)**

6 **CEC Rd 2 MMF-0073b**

7 **ORIGINAL PREAMBLE AND QUESTION (MMF-0034b):**

8 EIS Scoping Document Reference: 4.2.2 – Population, Infrastructure, and Services: “The
 9 EIS will describe the following attributes in the relevant study area(s): Existing
 10 population distribution and demographics ...”

11 5.1 – Project Effects: “Based on the description of the Project... ..and the existing
 12 environment... ..the EIS will identify the effects of the Project on the environment...” As
 13 stated in the EIS, “Population is a supporting topic that leads to an understanding of
 14 changes to housing, infrastructure and services” (R to EIS, Section 6.6.4.1, p. 6-449).
 15 Using Statistics Canada 2006 Census data, the EIS provides the populations of (1) the
 16 KCNs combined, including both on- and off-reserve Members, (2) Gillam, and (3)
 17 Thompson. The EIS then provides population projections to understand population
 18 growth both with and without the project. The analysis focuses on the Local Study Area;
 19 the Project is not expected to result in population changes in the Regional Study Area (R
 20 to EIS, Section 6.2.3.5.3, p.6-149, p. 6-150; R to EIS, Section 6.6.4.1, p. 6-449, p. 6-450).

21 Forty-five percent of the population of Gillam self-identified as Aboriginal in the 2006
 22 Census (Socio-economic SV, Section 4, p. 4-34), while 72% of the population of the
 23 Regional Study Area is identified as Aboriginal (Socio-economic SV, Section 4, p. 4-97).
 24 The EIS, however, does not present information regarding the Métis population in the
 25 Local Study Area communities, or the distribution of the Métis population in the Local
 26 and Regional Study Areas. This information would enable a better understanding of how
 27 the Métis residing in communities in the Local Study Area might experience impacts as a
 28 result of changes in population. This understanding is particularly critical, as the Métis
 29 are not specifically included in the mitigation and offsetting programs conducted as part
 30 of the Adverse Effect Agreements (AEAs) negotiated between the KCNs and Manitoba
 31 Hydro.

32 · Provide estimates of the Métis population in the Regional Study Area, including,
 33 specific communities.

34 **FOLLOW-UP QUESTION:**

- 35 · If the results of the Métis-specific Traditional Land Use and Knowledge Study
36 (TLUKS), Socio-economic Impact Assessment and historical narrative for the Keeyask
37 region present more detailed information regarding the Métis population figures in
38 the Regional Study Area, will this information be used to reassess potential impacts
39 on the Métis in the Regional Study Area and to identify new mitigation measures or
40 revise existing mitigation measures to address such impacts?

41 **RESPONSE:**

42 Please see response to CEC Rd 2 MMF-0073a.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section:**
 2 **6.2.3.5.3 Population, Infrastructure and Services, 6.6.4.2 Housing;**
 3 **Page No.: 6-152, 6-153, 6-453 - 6-455**

4 **CEC Rd 2 MMF-0074a**

5 **ORIGINAL PREAMBLE AND QUESTION (MMF-0035a):**

6 EIS Scoping Document Reference: 4.2.2 – Population, Infrastructure, and Services: “The
 7 EIS will describe the following attributes in the relevant study area(s): Existing
 8 infrastructure and services of Aboriginal and other in-vicinity communities, including...
 9 ...housing/accommodation supply...”

10 5.1 – Project Effects: “Based on the description of the Project... ...and the existing
 11 environment... ...the EIS will identify the effects of the Project on the environment...”
 12 The EIS describes the current availability of housing in the KCNs communities, Gillam,
 13 and Thompson (R to EIS, Section 6.2.3.5.3, p. 6-152), and predicts the residual effects of
 14 Project construction on housing in the KCNs communities, Gillam and Thompson to be
 15 adverse, in terms of the demand that will be created for housing, particularly temporary
 16 housing, during construction, and in the context of current levels of housing availability
 17 (R to EIS, Section 6.6.4.2, p. 6-453).

18 It is necessary to understand how adverse impacts on housing during construction might
 19 be experienced by the Métis populations residing in Local Study Area communities. (To
 20 understand the magnitude of this impact, it is necessary to understand the size of the
 21 Métis populations in the Local Study Area communities. A previous IR requested that
 22 the Proponent provide an estimate of the Métis populations in the Local Study Area
 23 communities).

- 24 · Predict how the Métis population in the Local Study Area communities, particularly
 25 Gillam, might be anticipated to experience adverse effects on the availability of
 26 housing during construction.

27 **FOLLOW-UP QUESTION:**

28 If the results of the Métis-specific Traditional Land Use and Knowledge Study, Socio-
 29 economic Impact Assessment and historical narratives on Métis use and occupancy in
 30 northern Manitoba and in the Keeyask region demonstrate a potential impact to the
 31 availability and cost of housing for the Metis in the Local and Regional Study Areas as a
 32 result of the project, will the Partnership reassess the potential impacts and identify
 33 mitigation measures to address potential effects on housing as these might be
 34 experienced by the Metis?

35 **RESPONSE:**

36 The Partnership remains committed to considering any additional information provided
37 through these studies. The Partnership is committed to ongoing dialogue with the MMF
38 so that it can determine how best to incorporate this new information into planning and
39 development processes for the Keeyask Generation Project, once it is available.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section:**
2 **6.2.3.5.3 Population, Infrastructure and Services, 6.6.4.2 Housing;**
3 **Page No.: 6-152, 6-153, 6-453 - 6-455**

4 **CEC Rd 2 MMF-0074b**

5 **ORIGINAL PREAMBLE AND QUESTION (MMF-0035b):**

6 EIS Scoping Document Reference: 4.2.2 – Population, Infrastructure, and Services: “The
7 EIS will describe the following attributes in the relevant study area(s): Existing
8 infrastructure and services of Aboriginal and other in-vicinity communities, including...
9 ...housing/accommodation supply...”

10 5.1 – Project Effects: “Based on the description of the Project... ...and the existing
11 environment... ...the EIS will identify the effects of the Project on the environment...”
12 The EIS describes the current availability of housing in the KCNs communities, Gillam,
13 and Thompson (R to EIS, Section 6.2.3.5.3, p. 6-152), and predicts the residual effects of
14 Project construction on housing in the KCNs communities, Gillam and Thompson to be
15 adverse, in terms of the demand that will be created for housing, particularly temporary
16 housing, during construction, and in the context of current levels of housing availability
17 (R to EIS, Section 6.6.4.2, p. 6-453).

18 It is necessary to understand how adverse impacts on housing during construction might
19 be experienced by the Métis populations residing in Local Study Area communities. (To
20 understand the magnitude of this impact, it is necessary to understand the size of the
21 Métis populations in the Local Study Area communities. A previous IR requested that
22 the Proponent provide an estimate of the Métis populations in the Local Study Area
23 communities).

- 24 · Identify measures that could be implemented, and identify the party or parties
25 responsible for their implementation, to lessen the predicted adverse effects to
26 housing as specifically experienced by the Métis.

27 **FOLLOW-UP QUESTION:**

28 No further questions at this time.

29 **RESPONSE:**

30 No response required.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section:**
 2 **6.2.3.5.3 Population, Infrastructure and Services, 6.6.4.3**
 3 **Infrastructure and Services; Page No.: 6-153 to 6-156, 6-455 to 6-**
 4 **459**

5 **CEC Rd 2 MMF-0075a**

6 **ORIGINAL PREAMBLE AND QUESTION (MMF-0036):**

7 EIS Scoping Document Reference: 4.2.2 – Population, Infrastructure, and Services: “The
 8 EIS will describe the following attributes in the relevant study area(s): Existing
 9 infrastructure and services of Aboriginal and other in-vicinity communities...”

10 5.1 – Project Effects: “Based on the description of the Project... ..and the existing
 11 environment... ..the EIS will identify the effects of the Project on the environment...”
 12 The EIS describes existing infrastructure and service delivery in the KCNs, Gillam and
 13 Thompson (R to EIS, Section 6.2.3.5.3, p. 6-153 to 6-156), and predicts residual effects of
 14 Project construction on the infrastructure and services of the Local Study Area
 15 communities to be adverse (R to EIS, Section 6.6.4.3, p. 6-458). To address adverse
 16 effects, mitigation measures are provided for Local Study Area communities (R to EIS,
 17 Section 6.6.4.3, p. 6-458). As well, new infrastructure and services are included in the
 18 AEAs negotiated between each of the KCNs and Manitoba Hydro (R to EIS, Section
 19 6.6.4.3, Table 6-45, p.6-457).

20 It is necessary to understand how adverse impacts on infrastructure and services during
 21 construction might be experienced by the Métis populations residing in Local Study Area
 22 communities. (To understand the magnitude of this impact, it is necessary to
 23 understand the size of the Métis populations in the Local Study Area communities. A
 24 previous IR requested that the Proponent provide an estimate of the Métis populations
 25 in the Local Study Area communities). This understanding is particularly critical, as
 26 Manitoba Hydro has not negotiated an AEA with the Métis in the Local Study Area, and
 27 as such, several of the new infrastructure and services that will be available to the KCNs
 28 will not be available to the Métis in the Local Study Area communities.

29 · Predict how the Métis population in the Local Study Area communities, particularly
 30 Gillam, might be anticipated to experience adverse effects on infrastructure and
 31 services during construction.

32 **FOLLOW-UP QUESTION:**

33 If the results of the Métis-specific Traditional Land Use and Knowledge Study, Socio-
 34 economic Impact Assessment and historical narratives on Métis use and occupancy in
 35 northern Manitoba and in the Keeyask region demonstrate previously unidentified

36 potential impacts on infrastructure and services in the Local and Regional Study Areas as
37 a result of the project, will the Partnership reassess the potential impacts and identify
38 mitigation measures to address potential effects as these might be experienced by the
39 Métis?

40 **RESPONSE:**

41 The Partnership remains committed to considering any additional information provided
42 through these studies. The Partnership is committed to ongoing dialogue with the MMF
43 so that it can determine how best to incorporate this new information into planning and
44 development processes for the Keeyask Generation Project, once it is available.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section:**
2 **6.2.3.5.3 Population, Infrastructure and Services, 6.6.4.3**
3 **Infrastructure and Services; Page No.: 6-153 to 6-156, 6-455 to 6-**
4 **459**

5 **CEC Rd 2 MMF-0075b**

6 **ORIGINAL PREAMBLE AND QUESTION (MMF-0036):**

7 EIS Scoping Document Reference: 4.2.2 – Population, Infrastructure, and Services: “The
8 EIS will describe the following attributes in the relevant study area(s): Existing
9 infrastructure and services of Aboriginal and other in-vicinity communities...”

10 5.1 – Project Effects: “Based on the description of the Project... ..and the existing
11 environment... ..the EIS will identify the effects of the Project on the environment...”
12 The EIS describes existing infrastructure and service delivery in the KCNs, Gillam and
13 Thompson (R to EIS, Section 6.2.3.5.3, p. 6-153 to 6-156), and predicts residual effects of
14 Project construction on the infrastructure and services of the Local Study Area
15 communities to be adverse (R to EIS, Section 6.6.4.3, p. 6-458). To address adverse
16 effects, mitigation measures are provided for Local Study Area communities (R to EIS,
17 Section 6.6.4.3, p. 6-458). As well, new infrastructure and services are included in the
18 AEAs negotiated between each of the KCNs and Manitoba Hydro (R to EIS, Section
19 6.6.4.3, Table 6-45, p.6-457).

20 It is necessary to understand how adverse impacts on infrastructure and services during
21 construction might be experienced by the Métis populations residing in Local Study Area
22 communities. (To understand the magnitude of this impact, it is necessary to
23 understand the size of the Métis populations in the Local Study Area communities. A
24 previous IR requested that the Proponent provide an estimate of the Métis populations
25 in the Local Study Area communities). This understanding is particularly critical, as
26 Manitoba Hydro has not negotiated an AEA with the Métis in the Local Study Area, and
27 as such, several of the new infrastructure and services that will be available to the KCNs
28 will not be available to the Métis in the Local Study Area communities.

29 No further questions at this time.

- 30 · Identify measures that could be implemented, and identify the party or parties
31 responsible for their implementation, to lessen the predicted adverse effects to
32 infrastructure and services as specifically experienced by the Métis.

33 **FOLLOW-UP QUESTION:**

34 No further questions at this time.

- 35 **RESPONSE:**
- 36 No response required.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 6.6.5.1**
 2 **– Governance, Goals and Plans, 6.6.5.2 – Community Health, 6.6.5.3**
 3 **– Mercury and Human Health, 6.6.5.6 – Culture and Spirituality;**
 4 **Page No.: 6-465 to 6-468, 6-468 to 6-473, 6-473 to 6-478, 6-490 to**
 5 **6-497**

6 **CEC Rd 2 MMF-0076**

7 **ORIGINAL PREAMBLE AND QUESTION (MMF-0037):**

8 EIS Scoping Document Reference: 4.2.3 – Personal, Family and Community Life: The EIS
 9 will describe the following attributes in the relevant study area(s): public safety; travel,
 10 access and safety; aesthetics; health status and health issues; culture and spirituality;
 11 governance, goals and plans.

12 Some of the VECs used to assess the effects of the Project on personal, family and
 13 community life in the Local Study Area include (1) Governance, Goals and Plans, (2)
 14 Community Health, and (3) Mercury and Human Health. The assessment results for each
 15 of these VECs are described below.

16 “Overall, the expected and likely Project residual effects on the KCNs governance, goals
 17 and plans are expected to be positive due to existing provisions of the JKDA and AEAs
 18 and ongoing involvement in Project committees and the Board. Residual effects on
 19 Gillam and Thompson governance, goals and plans are expected to be neutral (due to
 20 the planning processes already in hand)” (R to EIS, Section 6.6.5.1, p. 6-468).

21 Governance, Goals and Plans

22 In the discussion for this VEC, a description of Métis governance, goals and plans, and
 23 how the Project could be expected to impact these, is not included. Furthermore, and as
 24 evident in the above text, the Proponent is relying on the JKDA and the AEAs to mitigate
 25 impacts to the KCNs. This has implications for the Métis, with whom Manitoba Hydro
 26 has not negotiated an AEA.

27 “Overall, residual Project effects on community health are expected to be adverse for
 28 the construction phase due to the potential for increased alcohol and drug use, adverse
 29 worker interactions and worry about impending changes to the environment; and
 30 positive for the operation phase due to the implementation of AEA programs and the
 31 commitment to ongoing communication and planning” (R to EIS, Section 6.6.5.2, p. 6-
 32 473).

33 Community Health

34 In the discussion for this VEC, there is no description of Project effects on the
35 community health of the Métis population in the Local Study Area communities.
36 Furthermore, and as evident in the above text, the Proponent is relying on the JKDA and
37 the AEA's to mitigate impacts to the KCNs. This has implications for the Métis, with
38 whom Manitoba Hydro has not negotiated an AEA.

39 Mercury and Human Health

40 As part of the assessment, a human health risk assessment was conducted. "The human
41 health risk assessment evaluated the potential exposure to methylmercury for the KCNs,
42 as these are the communities at greatest risk due to their use of country foods.
43 Although the human health risk assessment focused on the KCNs, the baseline
44 conditions and results of the risk assessment are also generally applicable to non-First
45 Nation individuals who use Stephens Lake and/or Gull Lake for resource harvesting in a
46 similar capacity" (R to EIS, Section 6.6.5.3, p.6-474). The EIS predicted residual Project
47 effects on mercury and human health to be adverse during the operation phase, "due to
48 the elevated levels of methylmercury in country foods" (R to EIS, Section 6.6.5.3, p. 6-
49 478). To mitigate adverse effects, the Proponent has referred to the AEA's. "Reduced use
50 of country foods may have its own health effects. To address this concern, fish
51 replacement programs have been included in each of the KCNs AEA's as a key measure
52 to encourage continued use of country food from areas unaffected by the Project" (R to
53 EIS, Section 6.6.5.3, p. 6-477).

54 In the discussion for this VEC, and apparent in the above text, the Proponent is relying
55 on the JKDA and the AEA's to mitigate impacts to the KCNs. This has implications for the
56 Métis, with whom Manitoba Hydro has not negotiated an AEA.

57 Culture and Spirituality

58 The discussion of this VEC is restricted to the KCNs; there is no apparent consideration
59 of the impacts of the Project on Métis culture and spirituality. Overall, the residual
60 Project effects on culture and spirituality are expected to be adverse (R to EIS, Section
61 6.6.5.6, p.6-496). To address these adverse effects, the Proponent refers to the AEA's
62 negotiated between Manitoba Hydro and the KCNs. "Within each agreement, a set of
63 cultural and AEA offsetting programs were developed which deal directly with the
64 potential adverse effects of the Project on culture and spirituality" (R to EIS, Section
65 6.6.5.6, p. 6-491).

66 For each of the VECs described above, explain how adverse impacts on the Métis
67 population residing in the Local Study Area communities will be identified and managed,
68 particularly in the absence of an AEA between Manitoba Hydro and the Métis, and given

69 the lack of mitigation and offset programs included in the AEA's between Manitoba
70 Hydro and the KCNs.

71 **FOLLOW-UP QUESTION:**

72 If the results of the Métis-specific Traditional Land Use and Knowledge Study, Socio-
73 economic Impact Assessment and historical narratives on Métis use and occupancy in
74 northern Manitoba and in the Keeyask region demonstrate previously unidentified
75 potential impacts, as these might be experienced by the Métis, on the above VECs in the
76 Local and Regional Study Areas as a result of the project, will the Partnership reassess
77 the potential impacts and identify mitigation measures to address potential effects as
78 these might be experienced by the Métis?

79 **RESPONSE:**

80 The Partnership remains committed to considering any additional information provided
81 through these studies. The Partnership is committed to ongoing dialogue with the MMF
82 so that it can determine how best to incorporate this new information into planning and
83 development processes for the Keeyask Generation Project, once it is available.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 6.6.3.5**
 2 **Resource Economy; Page No.: 6-446 to 6-449**

3 **CEC Rd 2 MMF-0077a**

4 **ORIGINAL PREAMBLE AND QUESTION (MMF-0039a):**

5 "The EIS evaluates the effects of the Project on the "cash and in-kind income and
 6 livelihood" of resource users in the KCNs communities, and concludes that these are
 7 expected to be neutral during construction and operations as a result of mitigation.
 8 "Losses of in-kind income from reduced domestic resource use in the vicinity of the
 9 Project are expected to be mitigated by the AEA offsetting programs that provide access
 10 to resource harvesting at alternative and unaffected locations as well as to healthy fish
 11 for consumption in communities" (R to EIS, Section 6.6.3.5.1, p.6-447). There are Métis
 12 residing in the Local and Regional Study Areas. These Métis, as well as other Métis, use
 13 and rely on the land in the Local and Regional Study Areas. Despite this, the EIS does not
 14 include an assessment of the impacts of the Project on the resource economy (i.e. the
 15 cash and in-kind income and livelihood) of the Métis. It states that the Proponent has
 16 been working with the MMF to undertake studies "...identifying any effects of the
 17 Project related to resource use of the area by their members..." but that "...there is no
 18 evidence to date of effects on members of the Manitoba Métis Federation... ..at the
 19 time this report was submitted" (R to EIS, Section 6.6.3.5, p.6-446).

20 The Métis anticipate adverse effects as a result of the Project on their cash and in-kind
 21 income and livelihood. Furthermore, and as evident in the preceding text, the
 22 Proponent is relying on the AEAs to mitigate impacts to the KCNs. This has implications
 23 for the Métis, with whom Manitoba Hydro has not negotiated an AEA. As such, no
 24 mitigation is in place to address the adverse economic effects anticipated by the Métis
 25 as a result of changes in their resource use."

26 · In the absence of studies identifying the effects of the Project on resource use by
 27 the Métis, on what information did the Proponent base their conclusion that
 28 "...there is no evidence to date of effects on members of the Manitoba Métis
 29 Federation..."?

30 **FOLLOW-UP QUESTION:**

31 · If the results of the Métis-specific Traditional Land Use and Knowledge Study, Socio-
 32 economic Impact Assessment and two historical narratives demonstrate previously
 33 unidentified potential impacts on the resource economy, as these might be
 34 experienced by the Métis in the Local and Regional Study Areas as a result of the
 35 project, will the Partnership reassess the potential impacts and identify and

- 36 implement mitigation measures to address effects as these might be experienced by
37 the Métis?
- 38 · If yes, what process will be used to conduct this reassessment and the identification
 - 39 of residual impacts as these might be experienced by the Métis?
 - 40 · If no, please provide a rationale and justification.

41 **RESPONSE:**

42 The Partnership remains committed to considering any additional information provided
43 through these studies. The Partnership is committed to ongoing dialogue with the MMF
44 so that it can determine how best to incorporate this new information into planning and
45 development processes for the Keeyask Generation Project, once it is available.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 6.6.3.5**
 2 **Resource Economy; Page No.: 6-446 to 6-449**

3 **CEC Rd 2 MMF-0077b**

4 **ORIGINAL PREAMBLE AND QUESTION (MMF-0039b):**

5 The EIS evaluates the effects of the Project on the “cash and in-kind income and
 6 livelihood” of resource users in the KCNs communities, and concludes that these are
 7 expected to be neutral during construction and operations as a result of mitigation.
 8 “Losses of in-kind income from reduced domestic resource use in the vicinity of the
 9 Project are expected to be mitigated by the AEA offsetting programs that provide access
 10 to resource harvesting at alternative and unaffected locations as well as to healthy fish
 11 for consumption in communities” (R to EIS, Section 6.6.3.5.1, p.6-447).

12 There are Métis residing in the Local and Regional Study Areas. These Métis, as well as
 13 other Métis, use and rely on the land in the Local and Regional Study Areas. Despite this,
 14 the EIS does not include an assessment of the impacts of the Project on the resource
 15 economy (i.e. the cash and in-kind income and livelihood) of the Métis. It states that the
 16 Proponent has been working with the MMF to undertake studies “...identifying any
 17 effects of the Project related to resource use of the area by their members...” but that
 18 “...there is no evidence to date of effects on members of the Manitoba Métis
 19 Federation... ..at the time this report was submitted” (R to EIS, Section 6.6.3.5, p.6-446).

20 The Métis anticipate adverse effects as a result of the Project on their cash and in-kind
 21 income and livelihood. Furthermore, and as evident in the preceding text, the
 22 Proponent is relying on the AEAs to mitigate impacts to the KCNs. This has implications
 23 for the Métis, with whom Manitoba Hydro has not negotiated an AEA. As such, no
 24 mitigation is in place to address the adverse economic effects anticipated by the Métis
 25 as a result of changes in their resource use.

26 · How will impacts on the resource economy of the Métis be identified and managed,
 27 particularly in the absence of an AEA between Manitoba Hydro and the Métis, and
 28 given the lack of mitigation and offset programs included in the AEAs between
 29 Manitoba Hydro and the KCNs?

30 **FOLLOW-UP QUESTION:**

31 Is the Partnership prepared to negotiate an Adverse Effects Agreement with the MMF to
 32 mitigate and offset impacts on the resource economy as these are anticipated to be
 33 experienced by the Métis?

34 **RESPONSE:**

35 Please see the response to CEC Rd 2 MMF-0063b.

1 **REFERENCE: Volume: Project Description Supporting Volume;**
2 **Section: 2.3 Principal Structures; 2.4 Supporting Infrastructure;**
3 **Page No.: N/A**

4 **CEC Rd 2 MB Wildlands-0087**

5 **ORIGINAL PREAMBLE AND QUESTION (MB Wildlands-0058):**

6 To enable Life Cycle Assessment of each principal structure and supporting
7 infrastructure of the Keeyask Generation project, provide estimate for:

- 8 1. Material use quantities for initial construction, and then
9 maintenance/repair/replacement over the project's service life;
- 10 2. Construction, excavation and quarrying energy use for initial construction and the
11 maintenance, repair, replacement construction;
- 12 3. Demolition, excavation, and deconstruction energy use for maintenance, repair,
13 replacement and decommissioning,
- 14 4. Quantity of explosive, particulate matter emissions, and emissions to water for
15 initial construction, maintenance/repair/replacement, and decommissioning; For
16 each component of the Keeyask Generation project.

17 These materials and energy use quantities to be provided for construction, and life of
18 the project. As per section 2.4.17 this request includes KIP infrastructure in the LSA for
19 Keeyask Generation

20 These requests are in an IR at the request of Manitoba Hydro Keeyask project managers.

21 **FOLLOW-UP QUESTION:**

22 Please clarify whether the following principle structures and supporting infrastructure
23 elements (as defined in the EIS Project Description volume) are included in the LCA
24 analysis scope:

- 25 · Transition structures
- 26 · Wing walls
- 27 · Main camp and work areas buildings
- 28 · North and south dykes
- 29 · Sources of rock, granular and soil material
- 30 · Placement areas for excess excavated material

31 For elements not included in scope, please provide an estimate of life cycle
32 environmental effects or a justification for exclusion from analysis.

33 **RESPONSE:**

34 The life cycle assessment (LCA) completed for the Keeyask Generation Project provides
35 details on the quantification of life cycle effects that result from construction, land use
36 change, operation and eventual decommissioning. The associated report is Technical
37 Memorandum GN 9.5.5. (A Life Cycle Assessment of Greenhouse Gases and Select
38 Criteria Air Contaminants).

39 In many instances throughout the LCA analysis, common or related activities were
40 grouped or organized in order to facilitate the analysis or to simplify the communication
41 of information. Although the inputs and results are not disaggregated for the specific
42 project components identified within this question, all of these project structures and
43 associated activities have been captured within the LCA analysis scope. For example,
44 the total material and fuel quantities provided in the LCA for inputs such as steel and
45 concrete are total values for the entire project and are inclusive of the specific elements
46 identified in this question. The resulting emission implications are included within the
47 scope of the LCA.

1 **REFERENCE: Volume: Project Description Supporting Volume;**
2 **Section: 2.3 Principal Structures; 2.4 Supporting Infrastructure ;**
3 **Page No.: N/A**

4 **CEC Rd 2 MB Wildlands-0088**

5 **ORIGINAL PREAMBLE AND QUESTION (MB Wildlands-0058):**

6 To enable Life Cycle Assessment of each principal structure and supporting
7 infrastructure of the Keyask Generation project, provide estimate for:

- 8 1. Material use quantities for initial construction, and then
9 maintenance/repair/replacement over the project's service life;
- 10 2. Construction, excavation and quarrying energy use for initial construction and the
11 maintenance, repair, replacement construction;
- 12 3. Demolition, excavation, and deconstruction energy use for maintenance, repair,
13 replacement and decommissioning,
- 14 4. Quantity of explosive, particulate matter emissions, and emissions to water for
15 initial construction, maintenance/repair/replacement, and decommissioning; for
16 each component of the Keyask Generation project.

17 These materials and energy use quantities to be provided for construction, and life of
18 the project. As per section 2.4.17 this request includes KIP infrastructure in the LSA for
19 Keyask Generation. These requests are in an IR at the request of Manitoba Hydro
20 Keyask project managers.

21 **FOLLOW-UP QUESTION:**

22 The following activities are reported to be included in LCA analysis scope (Section
23 8.2.1.1), but the corresponding environmental effects are not presented in Table 15:

- 24 · A5 - Extract gravel
- 25 · A6 - Transport gravel
- 26 · A15 - House laborers
- 27 · A22 - Mix concrete
- 28 · C13 - Remove transmission line

29 Please clarify where results for these activities are provided in the report; for activities
30 not included in scope, please provide an estimate of life cycle environmental effects or a
31 reason for exclusion from analysis.

32 **RESPONSE:**

33 The life cycle assessment (LCA) completed for the Keeyask Generation Project provides
34 details on the quantification of life cycle effects that result from construction, land use
35 change, operation and eventual decommissioning. The associated report is Technical
36 Memorandum GN 9.5.5. (A Life Cycle Assessment of Greenhouse Gases and Select
37 Criteria Air Contaminants).

38 In many instances throughout the LCA analysis, common or related activities were
39 grouped or organized in order to facilitate the analysis or to simplify the communication
40 of information. Although the results are not disaggregated in Table 15 for the specific
41 project components identified within this question, all of these project activities and
42 materials have been captured within the LCA analysis scope. For example, the total
43 diesel fuel quantities provided in the LCA are gross values for the entire project and are
44 inclusive of the specific elements (such as extracting and transporting gravel) identified
45 in this question. The resulting emission implications are included within the scope of the
46 LCA.

1 **REFERENCE: Volume: Project Description Supporting Volume;**
2 **Section: 2.3 Principal Structures; 2.4 Supporting Infrastructure;**
3 **Page No.: N/A**

4 **CEC Rd 2 MB Wildlands-0089**

5 **ORIGINAL PREAMBLE AND QUESTION (MB Wildlands-0058):**

6 To enable Life Cycle Assessment of each principal structure and supporting
7 infrastructure of the Keyask Generation project, provide estimate for:

- 8 5. Material use quantities for initial construction, and then
9 maintenance/repair/replacement over the project's service life;
- 10 6. Construction, excavation and quarrying energy use for initial construction and the
11 maintenance, repair, replacement construction;
- 12 7. Demolition, excavation, and deconstruction energy use for maintenance, repair,
13 replacement and decommissioning,
- 14 8. Quantity of explosive, particulate matter emissions, and emissions to water for
15 initial construction, maintenance/repair/replacement, and decommissioning; For
16 each component of the Keyask Generation project.

17 These materials and energy use quantities to be provided for construction, and life of
18 the project. As per section 2.4.17 this request includes KIP infrastructure in the LSA for
19 Keyask Generation. These requests are in an IR at the request of Manitoba Hydro
20 Keyask project managers.

21 **FOLLOW-UP QUESTION:**

22 The following activities are reported to be included in LCA assessment scope (Section
23 8.2.1.1), but are reported to have no associated environmental effects (i.e. 0 values) in
24 Table 15:

- 25 • A3 - Construct transmission line
- 26 • A10 - Rehabilitate laydown and access roads
- 27 • A19 - Mine aggregate
- 28 • A23 - Manufacture precast concrete
- 29 • A24 - Transport precast concrete to site

30 Please provide an estimate of life cycle environmental effects or a justification for
31 exclusion from analysis.

32 **RESPONSE:**

33 The life cycle assessment (LCA) completed for the Keeyask Generation Project provides
34 details on the quantification of life cycle effects that result from construction, land use
35 change, operation and eventual decommissioning. The associated report is Technical
36 Memorandum GN 9.5.5 (A Life Cycle Assessment of Greenhouse Gases and Select
37 Criteria Air Contaminants).

38 In many instances throughout the LCA analysis, common or related activities were
39 grouped or organized in order to facilitate the analysis or to simplify the communication
40 of information. Although the results are not disaggregated in Table 15 for the specific
41 project components identified within this question, all of these project activities and
42 materials have been captured within the LCA analysis scope. For example, the total
43 diesel fuel quantities provided in the LCA are gross values for the entire project and are
44 inclusive of the specific elements (such as constructing the transmission line,
45 rehabilitating temporary roadways and mining aggregate) identified in this question.
46 The resulting emission implications are included within the scope of the LCA.

47 With respect to the manufacture and transportation of precast concrete activities, this
48 specific activity reflects only precast concrete batched offsite (for example in Winnipeg)
49 and transported to the Project site. As concrete will be produced onsite and is already
50 captured within the overall material and fuel inputs, any life cycle implications of offsite
51 precast concrete were deemed insignificant as this activity contained less than 1% of the
52 total material mass input into the analysis (consistent with the criteria outlined in
53 Section 4.2 of the LCA report).

1 **REFERENCE: Volume: Project Description Supporting Volume;**
2 **Section: 2.3 Principal Structures, 2.4 Supporting Infrastructure;**
3 **Page No.: N/A**

4 **CEC Rd 2 MB Wildlands-0090**

5 **ORIGINAL PREAMBLE AND QUESTION (MB Wildlands-0056):**

6 Estimates requested for principal structures, and supporting infrastructures as noted in
7 reference volume:

- 8 1. Mix designed for ready mix concrete and grout.
- 9 2. Materials manufacturing locations, and transportation distance and mode to site.
- 10 3. Construction waste factors (% concrete, % structural steel, etc) for initial
11 construction and maintenance, repair, replacement.
- 12 4. End of life outcomes for materials (disposal, incineration, recycling, reuse) for initial
13 construction (construction waste), maintenance/repair/replacement, and
14 decommissioning.
- 15 5. Material transportation distance and mode to end of life facility (landfill, scrap yard,
16 etc).

17 These requested estimates are in IR form at the request of the Keeyask project
18 managers.

19 **FOLLOW-UP QUESTION:**

20 Please clarify whether transport of aggregate to site and within the project area (activity
21 A21) is included in results presented in Table 15. If not included in scope, please provide
22 an estimate of life cycle environmental effects or a reason for exclusion from analysis.

23 **RESPONSE:**

24 The life cycle assessment (LCA) completed for the Keeyask Generation Project provides
25 details on the quantification of life cycle effects that result from construction, land use
26 change, operation and eventual decommissioning. The associated report is Technical
27 Memorandum GN 9.5.5 (A Life Cycle Assessment of Greenhouse Gases and Select
28 Criteria Air Contaminants).

29 Table 15 provides the emissions associated with the life cycle of the Keeyask Generation
30 Project including Activity A21 – Transport Cement. This includes the transport of cement
31 from its source outside of Manitoba to the Project area.

32 In many instances throughout the LCA analysis, common or related activities were
33 grouped or organized in order to facilitate the analysis or to simplify the communication

34 of information. Although the results are not disaggregated in Table 15 for the transport
35 of aggregate within the project area, this project activity and associated diesel fuel have
36 been captured within the LCA analysis scope. The total diesel fuel quantities provided in
37 the LCA are gross values for the entire project and are inclusive of transport of
38 aggregate. The resulting emission implications are included within the scope of the LCA.

1 **REFERENCE: Volume: Project Description Supporting Volume;**
2 **Section: 2.3 Principal Structures, 2.4 Supporting Infrastructure;**
3 **Page No.: N/A**

4 **CEC Rd 2 MB Wildlands-0091**

5 **ORIGINAL PREAMBLE AND QUESTION (MB Wildlands-0056):**

6 Estimates requested for principal structures, and supporting infrastructures as noted in
7 reference volume:

- 8 1. Mix designed for ready mix concrete and grout.
- 9 2. Materials manufacturing locations, and transportation distance and mode to site.
- 10 3. Construction waste factors (% concrete, % structural steel,, etc) for initial
11 construction and maintenance, repair, replacement.
- 12 4. End of life outcomes for materials (disposal, incineration, recycling, reuse) for initial
13 construction (construction waste), maintenance/repair/replacement, and
14 decommissioning.
- 15 5. Material transportation distance and mode to end of life facility (landfill, scrap yard,
16 etc).

17 These requested estimates are in IR form at the request of the Keeyask project
18 managers.

19 **FOLLOW-UP QUESTION:**

20 Please clarify whether transportation backhaul effects are included in analysis. If not
21 included in scope, please provide an estimate of life cycle environmental effects or a
22 reason for exclusion from analysis

23 **RESPONSE:**

24 The life cycle assessment (LCA) completed for the Keeyask Generation Project provides
25 details on the quantification of life cycle effects that result from construction, land use
26 change, operation and eventual decommissioning. The associated report is Technical
27 Memorandum GN 9.5.5 (A Life Cycle Assessment of Greenhouse Gases and Select
28 Criteria Air Contaminants).

29 Fuel consumption associated with return backhaul trips for truck transport was not
30 included in the LCA analysis.

31 A very conservative approach to estimate the life cycle implications of transportation
32 backhaul trips would be to double all road transport GHG emissions. This would assume
33 that there are no productive backhaul loads although the fuel consumption would

34 reflect a full load. If this were done it would increase the overall LCA GHG emissions of
35 the Keeyask Generation Project by approximately 3%. Actual life cycle implications will
36 be lower as trucks would either be returned empty or would be associated with other
37 projects, industries or parties.

1 **REFERENCE: Volume: Project Description Supporting Volume;**
2 **Section: N/A; Page No.: N/A**

3 **CEC Rd 2 MB Wildlands-0092**

4 **ORIGINAL PREAMBLE AND QUESTION (MB Wildlands-0054):**

5 Operational stage of Keeyask facilities estimates required for LCA.

- 6 1. Operational energy use estimates:
7 · for facilities
8 · for reserve power, including system testing
9 2. Operational material use estimates:
10 · Need of oil, hydraulic fluids, and or fat, as well as potential emissions
11 thereof to the waterways
12 3. Operational waste estimates:
13 · Amount, by type
14 · Transportation distance and modes to handling/treatment/disposition
15 4. Maintenance estimates:
16 · Energy and materials use, eg. lubrication, inspection trips

17 These requested estimates are in the IR form at the request of Keeyask project
18 managers.

19 **FOLLOW-UP QUESTION:**

20 Please provide the following model inputs:

- 21 · Grid electricity and diesel consumption assumed for activity A42 (Generate
22 Electricity.
23 · Assumptions used to calculate laborer transportation effects (activity A16) not
24 noted in Table 8, including number of laborers and trips.
25 · Transportation distances and modes for materials sent to a recycling facility at end
26 of life. Does the system boundary include concrete crushing (to produce aggregate)
27 at end of life?

28 **RESPONSE:**

29 As stated in CEC Rd 1 MWL-0051, the data the Partnership is prepared to make available
30 are included in its EIS filing, in the Technical Reports outlined in Appendix 6A of the
31 Response to EIS Guidelines and on the Partnership Web site at:
32 <http://www.keeyask.com>.

33 With respect to the system boundary question, the LCA includes decommissioning
34 activities required to dismantle and demolish the concrete works. It does not include
35 additional activities to crush the concrete to produce aggregate.

1 **REFERENCE: Volume: Project Description Supporting Volume;**
2 **Section: N/A; Page No.: Table 2-1**

3 **CEC Rd 2 MB Wildlands-0093**

4 **ORIGINAL PREAMBLE AND QUESTION (MB Wildlands-0059):**

- 5 1. Provide annual carbon stock estimates for all lands listed in Table 2.1 – for the
6 current year, and each year in the project life cycle.
- 7 2. Provide volume of wood entering manufacturing streams, for all logs and fibre
8 removed from the project area.
- 9 3. Provide volume of wood material to be cleared from the project area, and then
10 burned. Provide for project construction period and the first 30 years of operation.
- 11 4. Provide annual carbon stock estimates for no build scenarios.
- 12 5. Provide annual land cover descriptions (plant species) for all lands affected by the
13 project listed in Table 2.1 (both build and no build scenarios) to support estimates
14 for albedo changes. Provide these annual land cover descriptions by zone, for all
15 construction years, 30 years into project operation, and project life cycle.
- 16 6. Add to this information any lands/land uses not listed in Table 2.1 (Quarries.
17 Blasting eg)
- 18 7. What data was used for landscape, peatland and forest cover?

19 Manitoba Hydro Keeyask project managers indicated these requests should be
20 forwarded in IR format.

21 **FOLLOW-UP QUESTION:**

22 The LCA report does not provide the rationale for the assertion that 5,920 hectares will
23 be affected by the project. Table 2.1 of the EIS Project Description volume notes that
24 8,786 hectares (13,824 ha – 5038 ha) will be affected by the project when one excludes
25 the existing water surface area.

- 26 1. What is the nature of the land requirement in the EIS Project Description such that it
27 is not included in the calculation of land use impacts described in the LCA report?
- 28 2. Explain how each of the hectares figures above, from the EIS, were arrived at?

29 **RESPONSE:**

30 The referenced LCA is Technical Memorandum GN 9.5.5 (A Life Cycle Assessment of
31 Greenhouse Gases and Select Criteria Air Contaminants). The LCA categorizes areas of
32 land use change as either temporary or permanent. Temporary areas such as borrow
33 areas are not included in the GHG emission calculations. Areas considered temporary
34 are subject to regrowth and are assumed to result in an equivalent above ground
35 biomass within the 100 year time frame of the life cycle assessment. Areas categorized

36 as permanent include those that would remain permanently cleared or would be
 37 changed to a different density of above ground biomass. For areas such as roads and
 38 permanent infrastructure areas, the initial above ground biomass is not offset by any
 39 regrowth. The reservoir area is another area of permanent land-use change. At the time
 40 of the LCA, it was determined that the Keeyask project would permanently disturb 5,920
 41 ha of forested or semi-forested land.

42 The following areas are included in the permanently disturbed areas and are based on
 43 Supplemental Filing #2, filed on July 13, 2013:

Footprint Components	Area [ha]
Roads	638
Infrastructure	208
River Management	1
Excavated Material Placement Areas	99
Flooded Area	4,463
Reservoir Expansion	800
Total	6,209

44 The revised footprint area is 5% larger than what was used in the LCA report and is not
 45 expected to change the results or conclusions.

1 **REFERENCE: Volume: Project Description Supporting Volume;**
 2 **Section: N/A; Page No.: Table 2-1**

3 **CEC Rd 2 MB Wildlands-0094**

4 **ORIGINAL PREAMBLE AND QUESTION (MB Wildlands-0059):**

- 5 1. Provide annual carbon stock estimates for all lands listed in Table 2.1 – for the
- 6 current year, and each year in the project life cycle.
- 7 2. Provide volume of wood entering manufacturing streams, for all logs and fibre
- 8 removed from the project area.
- 9 3. Provide volume of wood material to be cleared from the project area, and then
- 10 burned. Provide for project construction period and the first 30 years of operation.
- 11 4. Provide annual carbon stock estimates for no build scenarios.
- 12 5. Provide annual land cover descriptions (plant species) for all lands affected by the
- 13 project listed in Table 2.1 (both build and no build scenarios) to support estimates
- 14 for albedo changes. Provide these annual land cover descriptions by zone, for all
- 15 construction years, 30 years into project operation, and project life cycle.
- 16 6. Add to this information any lands/land uses not listed in Table 2.1 (Quarries.
- 17 Blasting eg)
- 18 7. What data was used for landscape, peatland and forest cover?

19 Manitoba Hydro Keeyask project managers indicated these requests should be
 20 forwarded in IR format.

21 **FOLLOW-UP QUESTION:**

22 The Reservoir Greenhouse Gases Technical Memo completed by Environment Illimite
 23 provides no detail on the assumptions regarding existing land cover – instead referring
 24 to a value of 20.2 t dry matter per ha (Section 5.4). The LCA report generically reports
 25 forest, grassland, and peatland carbon mass per hectare in Table 14. The values in Table
 26 14 of the LCA report range from 4.25 – 146 t DM/ha depending on land cover type.
 27 What portion of each of the various land cover types described in Table 14 exist such
 28 that the weighted average is 20.2 t DM/ha? Was the 20.2 t DM/ha average used to
 29 calculate the non-reservoir land use impacts reported in the LCA report? What land use
 30 impact formulae were used to calculate the non-reservoir land use impacts?

31 **RESPONSE:**

32 The value of 20.2 tonnes of dry matter per hectare (tonnes d.m. ha⁻¹) was used in the
 33 estimation of greenhouse gas (GHG) emissions that would result from burning above
 34 ground biomass that is to be cut and cleared from within the proposed Keeyask

35 Reservoir prior to flooding. This value represents the estimated mass of fuel available
36 for combustion.

37 Table 14 in Technical Memorandum GN 9.5.5 presents the IPCC published carbon
38 content values of select land-cover types. The 20.2 tonnes d.m. ha⁻¹ factor was
39 determined based on these and additional IPCC above ground biomass carbon content
40 values, the respective areas of the impacted above ground vegetation types and an
41 estimate of the actual coverage of a specific vegetation type within each of the areas.
42 The reservoir area to be cut and cleared broadly contained the following land cover
43 types:

- 44 · Low vegetation / shrubs - 14%
- 45 · Forest/woodland areas re-vegetating following previous fires - 39%
- 46 · Sparsely treed areas - 18%
- 47 · Mature forest / woodland areas - 29%

48 The value of 20.2 tonnes d.m. ha⁻¹ was not used to calculate the non-reservoir land use
49 change impacts reported in the LCA report.

50 Specific types of land disturbance are treated differently within the life cycle
51 assessment. The life cycle assessment categorizes non-reservoir areas of land use
52 change as either temporary or permanent. Areas such as borrow areas are considered
53 temporary disturbances that are subject to regrowth and are assumed to result in an
54 equivalent above ground biomass within the 100 year time frame of the life cycle
55 assessment and as such, are not included in the GHG emission calculations. Areas
56 categorized as permanent include those that would remain permanently cleared or
57 would be changed to a different density of above ground biomass. For these types of
58 disturbances, the net change in above ground biomass (initial minus final) is considered.
59 For example, the biomass cleared for transmission right-of-ways is partially offset by
60 new shrub and grassland biomass that will grow in the right-of-way. For areas such as
61 the roads and permanent infrastructure areas, the initial above ground biomass is not
62 offset by any re-growth.

1 **REFERENCE: Volume: Aquatic Environment Supporting Volume;**
2 **Section: 2.3 Water Quality: Approach and Methods; Page No.: 2-2**

3 **CEC Rd 2 MB Wildlands-0095**

4 **ORIGINAL PREAMBLE AND QUESTION (MB Wildlands-0025 and**
5 **MB Wildlands-0026a,b):**

6 **MB Wildlands-0025**

7 In the relevant Ecosystem Services literature, it is demonstrated that a historic and
8 current lack of data exists to support informed decision making regarding ecosystem
9 goods, services and natural capital assets. These data should also be used to inform the
10 monitoring and management of the project:

- 11 1. Does this long-term proposed monitoring program strive to adapt and correct this
12 acknowledged scientific gap regarding natural capital within the project area?
13 2. Does it strive to change as the information needs change for local and regional
14 decision makers with regard to intensively managed flow regimes?
15 a. If yes, please verify this by providing plans, methodologies, etc. that
16 demonstrate this. If not, why not?

17 **MB Wildlands-0026a,b**

18 On page 2-2, it is stated "existing water quality conditions" are used as a baseline and
19 foundation for assessing the potential effects of the Project on water quality. Given that
20 the aquatic environment has already been substantially altered by hydroelectric
21 developments, as described on page 6-54 in the Response to EIS Guidelines, please
22 demonstrate 'existing' water conditions represent baseline conditions that are "suitable
23 for aquatic life?"

- 24 1. How is it demonstrated in the EIS that the existing conditions reflect properly
25 functioning aquatic systems that facilitate the necessary water quality services such
26 as water regulation, water supply, erosion control and sediment retention, and
27 waste treatment?
28 2. Have pre-alteration/ impoundment/ settlement conditions been considered for an
29 alternative baseline as has been done in the IISD Environment Canada report: An
30 Ecosystem Services Assessment of the Lake Winnipeg Watershed? 3. If not, can you
31 justify why you chose not to examine these conditions?

32 **FOLLOW-UP QUESTION:**

33 “Existing water quality conditions” are used as a baseline and foundation for assessing
34 the potential effects of the Project on water quality. In your response, it is stated that
35 the following water quality functions and services were not relevant to the ESA:

- 36 · Water regulation
- 37 · Water supply
- 38 · Erosion control
- 39 · Sediment retention
- 40 · Waste treatment.

41 Explain your reasoning to why these components are not relevant to the ESA.

42 **RESPONSE:**

43 As discussed in CEC Rd 1 MB Wildlands-0025, the Partnership has completed its
44 assessment of the potential environmental effects of the Project, and the development
45 of long-term mitigation and monitoring plans, in accordance with guidelines issued by
46 regulatory authorities and standard environmental assessment methodology. The
47 assessment guidelines do not require the Partnership to specifically provide an
48 ecosystem services assessment, including an economic valuation of ecosystem services.
49 The economic valuation of ecosystem services is also not considered to be standard
50 practice in project-specific environmental assessment and therefore was not conducted
51 as part of this assessment.

52 However, each of the topics of water regulation, water supply (e.g., for use in the
53 construction camp), erosion control, sediment retention, and waste treatment were
54 considered in the EIS.

1 **REFERENCE: Volume: Aquatic Environment Supporting Volume;**
2 **Section: N/A; Page No.: N/A**

3 **CEC Rd 2 MB Wildlands-0096**

4 **ORIGINAL PREAMBLE AND QUESTION (MB Wildlands-0096):**

5 Food production by the local and regional area will be altered by changes in water
6 quality.

- 7 1. Has data been made available to quantify the change in freshwater fishery value
8 associated with the change in water quality – nutrient concentrations in the project
9 local or regional area?
- 10 2. Has the financial Ecosystem Services/ biodiversity loss been quantified for
11 subsistence fisheries? Have replacement costs been calculated?
- 12 3. What is the cost of the price of the replacement food that it will take to bring in to
13 the communities when the subsistence fishery declines, as predicted in the aquatic
14 volume? Have these costs been quantified? This includes not only the price of food
15 but the price of shipping the food and emissions of doing so, as well as the
16 environmental costs of growing the food and bringing food into the territory in
17 general (LCA of replacement food products?)
- 18 4. Has this economic assessment been completed and appear in the EIS or supporting
19 documents? Are they available to public? If this has not been done, explain.

20 **FOLLOW-UP QUESTION:**

21 A value of food, which is derived from water (fresh or salt) has been linked indirectly to
22 water quality in many cases. While it is acknowledged that ecosystem services and
23 natural capital valuation of ecosystem services, such as the provision of food, is not
24 currently standard practices in site level ESAs, it may become standard practice by the
25 time the operation phase of Keeyask is ongoing.

26 Please provide data you've collected which could support this type of analysis, historic
27 and current.

28 **RESPONSE:**

29 The Partnership is unable to comment on what may become standard assessment
30 practice in the future. The Partnership has provided data in its EIS filing, in the Technical
31 Reports outlined in Appendix 6A of the Response to EIS Guidelines and on the
32 Partnership Web site at <http://www.keeyask.com>. Additional data will also be collected
33 through long-term monitoring programs associated with the Project. It is possible these
34 data could support this type of analysis, historic and current.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: R to EIS;**
2 **AE SV; TE SV 7.0; Executive Summary; Page No.: N/A**

3 **CEC Rd 2 MB Wildlands-0097**

4 **ORIGINAL PREAMBLE AND QUESTION (MB Wildlands-0052b):**

5 In several sections, habitat is mentioned either as a restoration and/or mitigation
6 function. It is described that as long as the habitat is recreated, the important species or
7 ecosystem, whether it be fish (spawning habitat) or geese (i.e., staging habitat) will be
8 replaceable and thus in the operation stage of the project populations will not be
9 adversely effected.

10 Some habitats have more species, and thus more genetic diversity than others. One
11 area of particular concern is genetic diversity of the lake sturgeon.

12 Does the planned stocking program will take into account the need to preserve genetic
13 diversity, and consequently biodiversity, of this endangered fish as per SARA and
14 COSEWIC guidelines? Please and the methodology and supporting documentation used
15 to come to these conclusions.

16 Which studies, methodologies, data sets, and assessment approaches did Manitoba
17 Hydro use to determine that the construction of suitable habitat will provide for the
18 maintenance of genetic diversity and the subsequent maintenance of biodiversity?

19 Please provide verification of the basis for the assessing future created sturgeon
20 habitats via studies, methodologies. Are these studies available to participants?

21 Where is it demonstrated that these constructed habitats will also produce the
22 regulating service of biological control in the context of biodiversity? Has it been
23 demonstrated that these important services are not needed by this endangered
24 species? Please demonstrate where in the EIS this is addressed. And please provide
25 verification of the basis for omitting these above habitat assessments via studies, data,
26 methodologies, etc. Are these studies available to participants?

27 **FOLLOW-UP QUESTION:**

28 A concept of mitigation is that it is possible to compensate for impacts to ecosystem
29 services at one site (the impact site) by replacing or increasing the same services at
30 another site (the mitigation site). This is the strategy the project is using for habitat loss.
31 A challenge in the use of off-site mitigation is assuring that ecosystem services, including
32 wildlife habitat, produced by off-site mitigation are commensurate with on-site impacts.
33 Recent increases in energy developments within Manitoba have raised concerns about
34 impacts associated with these activities and efforts to mitigate those impacts. Has a

35 metric system been developed to quantify impact losses and mitigation benefits for the
 36 proposed Keeyask project areas (local and regional)? If not, please advise as to where
 37 data that has been collected (past, present) and future monitoring plans address these
 38 mitigation metrics? While many countries require offset programs to balance the
 39 environmental degradation caused by development, these programs do not explicitly
 40 mitigate the impacts to people. Has this been considered in combination with
 41 biodiversity and water quality? Specifically, has the concept of a “serviceshed” been
 42 used at all in mitigation planning?

43 **RESPONSE:**

44 As described in the Response to EIS Guidelines in Section 5.3 (Assessment Framework),
 45 the assessment uses a VEC-based approach, as prescribed by the Guidelines. This
 46 approach involves selecting and examining components that represent the broader
 47 environment (aquatic, terrestrial and socioeconomic). The assessment involves
 48 developing a good familiarity with the various linkages and pathways of effects among
 49 VECs and other environmental components, in order to gain a good understanding of
 50 broader effects that are represented through VECs and supporting topics. In this way,
 51 the various ecosystem functions (e.g., primary production, climate regulation, carbon
 52 sequestering and storage) that support ecosystem services, such as culture and
 53 recreation, were all examined. Assessment methods are included in each supporting
 54 volume and monitoring methods are included in each monitoring plan. Quantifying and
 55 predicting changes in VECs therefore provides an understanding of changes to other
 56 components of the environment. Similarly, the Environmental Protection Program
 57 (summarized in Chapter 8 of the Response to EIS Guidelines) includes monitoring plans
 58 based primarily around VECs. In many instances, the monitoring includes the gathering
 59 of information on various supporting topics to assist in describing change, and to verify
 60 the effectiveness of any required mitigation over time.

61 Regarding the specific question about the use of a “serviceshed” concept for mitigation
 62 planning, based on the description provided this likely comes primarily from the recent
 63 working paper from Tallis et al (2012) (attached for reference), who introduce the
 64 concept as a mitigation approach that focuses on effects to beneficiaries – individuals or
 65 groups of people. There are many new, interesting and innovative ways to examine
 66 effects being developed, but as indicated above, the focus of the assessment for the
 67 Project was to follow assessment methods prescribed in the guidelines and existing
 68 guidance documents, such as those developed by the Canadian Environmental
 69 Assessment Agency. In terms of assessing impacts to beneficiaries, having a Partnership
 70 consisting of the locally-affected First Nations facilitated the identification of issues
 71 important to primary beneficiaries of the services provided by local ecosystems early on
 72 in the Project planning process, with mechanisms throughout the assessment to

73 explicitly confirm that mitigation and offsetting measures were developed to meet their
74 needs.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
2 **Volume; Section: N/A; Page No.: N/A**

3 **CEC Rd 2 MB Wildlands-0098**

4 **ORIGINAL PREAMBLE AND QUESTION (MB Wildlands-0004a):**

5 Maintaining biodiversity includes the control of populations, pests and diseases through
6 trophic dynamic processes. This is a regulating ecosystem service.

7 Original Question: Have the dynamics of local and regional ecosystems within the
8 Keeyask areas, and their natural biological control, been mapped or examined spatially
9 or temporally?

10 **FOLLOW-UP QUESTION:**

11 The response directed reviewers to the Terrestrial Environmental Supporting Volume.
12 Biodiversity is also an aquatic function and provides value necessary to all life. Please
13 advise as to where ecosystem functioning, both aquatic and terrestrial has been
14 assessed under changing environmental conditions. Ecosystem functioning should be
15 considered under multiple environmental conditions.

16 Please advise as to where these drivers and functions have been assessed together
17 relating to biodiversity and specifically genetic diversity, in a cumulative manner, under
18 multiple climate scenarios. Which metrics have been used to assess this? Please advise
19 where in the EIS and supporting documents these metrics have been identified and
20 explored.

21 **RESPONSE:**

22 A description of the ecosystem-based approach to the assessment of the aquatic
23 environment is provided in the Aquatic Environment Supporting Volume Section 1.0. A
24 brief overview of key ecosystem components and functions, and seasonal and inter-
25 annual variability is provided in Section 1.2.1. Important linkages to the Project are
26 described in Section 1.2.2.2. The environmental components included in the
27 assessment, which consider the ecosystem at multiple hierarchical levels of organization
28 and reflect biodiversity at various levels (e.g., habitat, species) are described in Section
29 1.2.2.3. The Valued Environmental Components (VECs) selected as the focus of the
30 assessment are described in Section 1.2.2.4. The fish species VECs occupy the range of
31 habitats in the affected ecosystem and thus are representative of effects not only to the
32 species itself, but also the related components of the ecosystem (e.g., other species that
33 occupy the same habitats).

34 Parameters relevant to specific ecosystem components, including VECs, are described in
35 detail in the individual sections. For example, the description of existing water quality
36 includes a discussion of seasonal, interannual, and, where relevant, daily variation (see
37 for example, Section 2.4.2.4.1 Dissolved Oxygen). Ecosystem functions relevant to the
38 assessment are considered where appropriate (e.g., decomposition in relation to
39 dissolved oxygen, AE SV Section 2.5.2.2.2).

40 The effect of climate change on predicted Project effects is discussed in AE SV Section
41 8.0.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
2 **Volume; Section: N/A; Page No.: N/A**

3 **CEC Rd 2 MB Wildlands-0099**

4 **ORIGINAL PREAMBLE AND QUESTION (MB Wildlands-0029):**

5 Biodiversity is mentioned 2.7.1 Page 1. It refers to ecosystem, species and genetic
6 diversity.

- 7 1. Have the genetic resources - such as medicine, products for materials, science,
8 genes for plant resistance and crop pests been assessed and included in the EIS?
- 9 2. Have any data (point, spatial, etc.) been collected regarding these biodiversity goods
10 and services?
- 11 3. Which studies, methodologies, data sets, and assessment approaches did Manitoba
12 Hydro use for the genetic diversity affected by the project?
- 13 4. What was scientific literature and methodology was used in the assessment? Have
14 these sources been made available to participants for review?

15 **FOLLOW-UP QUESTION:**

16 In your response to 0029, ecosystem intactness is used as a proxy for biodiversity.
17 "Servicesheds" is an emerging ecological concept where locations are identified that
18 provides specific ecosystem services to specific beneficiaries. This could be used in
19 combination with intactness. Please provide examples as to the past, current and future
20 data and monitoring plans that could address this method and associated metrics.

21 **RESPONSE:**

22 Please see the response to CEC Rd 2 MB Wildlands-0097 for the Partnership's approach
23 to the concept of servicesheds.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 4.0**
 2 **Mitigation; Page No.: N/A**

3 **CEC Rd 2 MB Wildlands-0100**

4 **ORIGINAL PREAMBLE AND QUESTION (MB Wildlands-0001a,b,c):**

5 On page 4-17, in Chapter 4, during mitigation discussions, the method employed for
 6 wetland mitigation will include the "Development of wetlands to offset potentially
 7 important wetlands". Wetlands serve many ecological functions which provide water
 8 quality ecological services such as the regulation of water flows, which purifies water;
 9 the filtering, retention and storage of fresh water ; the maintenance of arable land and
 10 prevents water silting by lowering soil losses; and the removal, breakdown or
 11 abatements of pollution. In order to "offset" the important wetlands during mitigation,
 12 these specific services need to be assessed (preferably spatially and temporally
 13 quantified in GIS- mapped) in order to know what is being provided by the existing
 14 wetland function.

- 15 1. Which studies, methodologies, data sets, and assessment approaches did Manitoba
 16 Hydro use to assess the ecosystem services and functions provided by wetlands to
 17 be mitigated ? Please provide verification of the basis for the planned mitigation
 18 activities via studies, methodologies, etc employed.
- 19 2. Are these studies available to participants? Where water quality related ecosystem
 20 services and functions of these wetlands have been identified, quantified and
 21 mapped. Explain how mitigation will be accomplished.
- 22 3. Are there technical reports to support these wetlands assessments in the EIS
 23 contents?

24 **FOLLOW-UP QUESTION:**

25 IR # 0001 a Please confirm that Manitoba Hydro has determine that 12 ha is sufficient
 26 for mitigation wetlands function loss as a result of Keeyask Generation Station. See para
 27 # 2 in response. A no net loss approach means no net loss of the amount and quality of
 28 an ecosystem elements or function. Does Manitoba Hydro maintain that only 12 ha of
 29 wetlands will be lost due to the Keeyask project?

30 IR # 0001 b It is unclear if ECOSTEM 2012 is part of the Manitoba Hydro filings. Is it
 31 among the technical reports not provided in the EIS filing in 2012? Or is it among the
 32 technical reports only available upon request as of late spring 2013?

33 **RESPONSE:**

34 As described in the response to TAC Public Rd 2 EC-0030, the Project has avoided,
 35 reduced and minimized potential effects on wetlands in many ways. After considering

36 all of these measures, 12 ha of wetland (off-system marsh) compensation is adequate to
37 mitigate remaining effects to a regionally acceptable level. As indicated in CEC Rd 1
38 MWL-0001a, the basis of the mitigation is to pursue no net area loss for off-system
39 marsh habitat. A no net loss approach was not taken for the other wetland types.

40 ECOSTEM (2012) was filed with regulators on July 15, 2013 as part of the technical
41 reports included with the responses to CEC Round 1 Information Requests. It is available
42 on the Partnership's website at Keyask.com.

43 **REFERENCES:**

44 ECOSTEM Ltd. 2012. Terrestrial Habitats and Ecosystems in the Lower Nelson River
45 Region: Keyask Regional Study Area. A report prepared for Manitoba Hydro.
46 506 pp.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 4.0**
2 **Mitigation; Page No.: N/A**

3 **CEC Rd 2 MB Wildlands-0101**

4 **ORIGINAL PREAMBLE AND QUESTION (MB Wildlands-0002a,b):**

5 In Chapter 4, the overall mitigation strategy for Keeyask is discussed. Rationale for
6 developing areas to compensate for losses of habitats and ecosystems is often a
7 strategy employed in development.

- 8 1. Are no-net loss of biodiversity or water quality part of this discussion? This
9 compensation terminology is often used as a means of replacing sensitive habitat
10 such as wetlands and species (i.e., sturgeon) but should be used to demonstrate the
11 maintenance of not just the habitat, species and wetlands, but it should
12 demonstrate that ecosystem services and biodiversity are not lost. Was this
13 approach used in the Keeyask EIS? If not, why not?
14 2. Please indicate how Keeyask restoration/mitigation plans look at restoring
15 biodiversity/water quality ecosystem services and the natural capital that these
16 ecosystems provide to the project and surrounding area.

17 **FOLLOW-UP QUESTION:**

18 Please provide Manitoba Hydro and KCN definitions for: Ecosystem services, natural
19 capital and mitigation.

20 **RESPONSE:**

21 As a comment on the question, it is noted in the response to CEC Rd 1 MB Wildlands-
22 0025 that the Partnership has completed its assessment of the potential environmental
23 effects of the Project, and the development of long-term mitigation and monitoring
24 plans, in accordance with guidelines issued by regulatory authorities and standard
25 environmental assessment methodology. The assessment guidelines do not require the
26 Partnership to undertake an evaluation of ecosystem services or an economic valuation
27 of natural capital within the project area, nor is this standard environmental assessment
28 practice.

29 Please see the response to CEC Rd 1 CAC-0011 for the definition of ecosystem services.

30 While not promoting any particular definition of natural capital since this is not a
31 component of the environmental assessment, a potential definition is the natural
32 resources and ecosystems that provide benefits to people. Please see the response to
33 CEC Rd 1 MB Wildlands-0031 for the Partnership's approach to natural capital.

- 34 Mitigation is a means of reducing adverse effects. Please see response to CEC Rd 1 MB
- 35 Wildlands-0002a for an overview of the Partnership's general approach to mitigation.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 4.0**
 2 **Mitigation; Page No.: N/A**

3 **CEC Rd 2 MB Wildlands-0102**

4 **ORIGINAL PREAMBLE AND QUESTION (MB Wildlands-0003a,b,c):**

5 In Chapter 4, on page 4-16, it is stated that spawning habitat/ over wintering habitat
 6 channels will be created for fish movement, spawning feeding and overwintering. Every
 7 flow regime alters the biotic as well as abiotic aspect of the environment. It has been
 8 shown in studies testing flow regimes that habitat classification and recreation are often
 9 difficult to achieve under altered flow regimes when the optimum habitat has not been
 10 characterized for each flow.

- 11 1. If the recreation of habitat is a major mitigation strategy to replace lost habitat for
 12 several species of fish, have the characteristics of optimum habitats been quantified
 13 and mapped spatially at the different possible flow regimes of the project?
 14 2. Which studies, methodologies, data sets, and assessment approaches did Manitoba
 15 Hydro use to assess the ecosystem services and functions biodiversity provided by
 16 habitat planned to be mitigated?
 17 3. Which on the development of habitat? Are these studies available to participants?
 18 Are there technical reports to support these assessments in the EIS contents? If so,
 19 which reports?

20 **FOLLOW-UP QUESTION:**

21 IR 0003a Please explain what 'nearly the full range of inflow' means in relation to
 22 scientific and technical information as the basis for this EIS. Is this in relation to the
 23 current environment (including all effects on flow of the Nelson River from hydro
 24 projects) or is it in relation to the former natural environment and river flows?
 25 Reference in the response to habitat suitability indices are provided. It is standard
 26 practice in reviews and regulatory processes for Class 3 licences under Manitoba's
 27 Environment Act to provide the details and methods used for an HAI. Are the indices
 28 referenced provided in the EIS, in the technical reports, in technical memoranda ? If not
 29 provide these indices technical methodology materials to participants and the CEC.

30 **RESPONSE:**

31 The text that referenced "nearly the full range of inflow" in the response to CEC Rd 1
 32 MB Wildlands-0003 stated:

33 *"The field studies of the existing environment observed nearly the full range of inflow*
 34 *and stage characteristics (AE SV Figure 3-2). Modelling and literature approaches to*
 35 *habitat assessment included the use of models over a wide range in flow (i.e., 5th to*

36 *95th percentile flows); for example, predictive substrate models compared the effect of*
37 *velocity, depth, and wave energy on substrate distributions using low and high flow data*
38 *(AE SV Map 3b-6). "*

39 The "full range of inflow" refers to flows that have occurred since development of
40 hydroelectric projects that affect inflows, specifically Lake Winnipeg Regulation and
41 Churchill River Diversion. AE SV Figure 3-2 illustrates flows during the open water season
42 in the years when the majority of field work was conducted (2001 – 2006). Flows ranged
43 from at or near record lows in 2003 to near record highs in spring 2006 and for most of
44 the open water season of 2005.

45 The methodology for the Lake Sturgeon Habitat Suitability Index is provided in the AE SV
46 Appendix 6D.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
2 **Volume; Section: N/A; Page No.: Map 3-1**

3 **CEC Rd 2 MB Wildlands-0103**

4 **ORIGINAL PREAMBLE AND QUESTION (MB Wildlands-0006):**

5 According to Map 3-1, the local study area for terrestrial plants encompassed an area
6 that was 150 m outside of the predicted flooding zone during construction phase. The
7 150 m study area did not encompass the expected additional zone of influence on
8 terrestrial plants during operation phase.

9 Answer the following questions:

- 10 1. What was the rationale behind selection of the Terrestrial Plant study area, given
11 that the majority of the terrestrial plant study area overlaps with the predicted
12 initial flooding area?
- 13 2. Why was 150 m selected as the buffer zone? Why did the buffer zone not include
14 the expected additional zone of flooding? Provide scientific basis for 150m buffer.
- 15 3. How specific were the plant studies conducted in zone 4 and within the terrestrial
16 plants regional study area? Provide list of plants for each.
- 17 4. The additional zone of influence within the terrestrial plant study area is vague in its
18 description of time line and duration of impact and area. A better description of this
19 impacted area is needed to provide periods of impact and the amount of area being
20 influenced.

21 **FOLLOW-UP QUESTION:**

22 Re IR 006 Answers to the # questions within this IR are not provided. Explain what
23 delimited means in paragraph # 2. What is the scientific basis for using the Project
24 Footprint only to determine effects for the Terrestrial Plants ? Were symbiotic
25 relationships included in the effects assessment for plants ? Were other species depend
26 on specific plant species and / or specific plant habitat included in the assessment ? If
27 not, why not Does Manitoba Hydro have a standard for including related elements
28 among species in the ecosystem or ecosystems which species inhabit ? Is such a
29 standard used in self assessment for licensing purposes ?

30 **RESPONSE:**

31 Each of the above questions is addressed in turn.

32 *Explain what delimited means in paragraph # 2.*

33 Delimited refers to how the study area boundaries were mapped.

34 *What is the scientific basis for using the Project Footprint only to determine effects for*
35 *the Terrestrial Plants?*

36 Two clarifications regarding this follow-up question are provided. First, the question
37 asked in CEC Rd 1 MB Wildlands-0006 related to how the Terrestrial Plant Local Study
38 Area was determined rather than which potential sources of Project effects on
39 terrestrial plants were assessed. Second, this follow-up question incorrectly indicates
40 that only the Project Footprint was used to determine effects on terrestrial plants. In
41 fact, the Project Footprint, physical disturbance in surrounding areas, construction
42 traffic and access-related effects were considered as Project-related sources of effects
43 on terrestrial plants (Terrestrial Environment Supporting Volume Section 3.4.1).

44 *Were symbiotic relationships included in the effects assessment for plants?*

45 Yes.

46 *Were other species depend on specific plant species and / or specific plant habitat*
47 *included in the assessment? If not, why not*

48 Yes.

49 *Does Manitoba Hydro have a standard for including related elements among species in*
50 *the ecosystem or ecosystems which species inhabit? Is such a standard used in self*
51 *assessment for licensing purposes?*

52 The Partnership's approach to including and assessing related elements among species
53 in the ecosystem or ecosystems which species inhabit is described in Section 1 of the
54 Aquatic Environment Supporting Volume and in Section 1 and Appendix 1A of the
55 Terrestrial Environment Supporting Volume.

1 **REFERENCE: Volume: N/A; Section: Preliminary Environment**
2 **Protection Program; Page No.: N/A**

3 **CEC Rd 2 MB Wildlands-0104**

4 **ORIGINAL PREAMBLE AND QUESTION (MB Wildlands-0008):**

5 The Environmental Protection Program (EnvPP) is referenced throughout the Keeyask
6 EIS materials. Inspection of the EnvPP shows that many areas are incomplete, and
7 program sections are separated, preventing assessment of the complete program and
8 its overall efficacy.

9 Answer the following questions

- 10 1. When will a completed version of the EnvPP be available?
11 2. Will there be a component of the EnvPP that reviews all individual programs
12 together to provide a thorough examination of program efficacy?
13 3. Will the EnvPP reports be available to public?

14 **FOLLOW-UP QUESTION:**

15 When will the Draft Fish Habitat Compensation Plan and Draft Aquatic Effects
16 Monitoring Plan be available to the public, participants and the CEC?

17 **RESPONSE:**

18 Preliminary Draft versions of the Aquatic Effects Monitoring Plan (AEMP) and Fish
19 Habitat Compensation Plan (FHCP) were provided to Fisheries and Oceans Canada
20 (DFO), Manitoba Conservation and Water Stewardship (MCWS), and the Canadian
21 Environmental Assessment Agency in the fall of 2012 (October 24 and November 9,
22 2012 respectively) to facilitate discussions regarding the federal regulatory approvals
23 requirements. While these documents are still under discussion with these regulatory
24 agencies and will be modified as an outcome of those discussions, in the interest of
25 transparency to the current process these 2012 draft versions have been posted on the
26 Partnership's website at: [http://keeyask.com/wp/the-project/environmental-
27 assessment-process/preliminary-environmental-protection-program](http://keeyask.com/wp/the-project/environmental-assessment-process/preliminary-environmental-protection-program).

28 The following points should be noted with respect to these drafts:

- 29 · The habitat compensation measures required to maintain fish populations upstream
30 and downstream of the generating station described in the FHCP are the same as
31 those listed in the AE SV Appendix 1A. The approach to fish passage described in the
32 FHCP and related monitoring in the AEMP may be further modified based on
33 discussions among the Partnership, DFO, and MCWS (see CEC Rd2-CEC-0091); and

34 • The plan will be updated to include measures identified during the IR process (e.g.,
35 definition of monitoring until “stable” mercury levels are reached).

36 The Partnership expects that, as with Authorizations and *Environment Act* licences for
37 other generating station projects, the final FHCP and AEMP will form part of the
38 regulatory approvals for the Keeyask Generation Project and once final versions are
39 developed they will be posted to the Project website.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
2 **Volume; Section: 1.3.6 Temporal Scope; Page No.: N/A**

3 **CEC Rd 2 MB Wildlands-0105**

4 **ORIGINAL PREAMBLE AND QUESTION (MB Wildlands-0073):**

5 The flooding of Gull Lake to create the Gull Lake reservoir for the Keeyask project, is
6 compared to the Kettle Generation Station reservoir; Stephens Lake. It is stated that the
7 Kettle reservoir stabilized after 30 years.

8 The Kettle Generation Station was completed in 1974, now 39 years prior. Studies
9 comparing the Keeyask and Kettle reservoirs were conducted between 2001 and 2011.
10 The Kettle Generation Station is only 39 years old (up to 2013). How can Manitoba
11 Hydro claim that the reservoir has stabilized after 30 years, when the studies evaluating
12 the stability of reservoir were conducted at the 30-year operational mark? An
13 additional 10 years or more would be required in order to conclude that no additional
14 changes occurred within the reservoir.

15 Answer the following questions:

- 16 1. How are the Keeyask and Kettle reservoirs comparable, and give examples?
- 17 2. Please describe how a reservoir becomes stable, how is this measured, and are
18 those measurements comparable to other reservoirs? Explain with regards to the
19 Kettle reservoir.
- 20 3. What other Manitoba Hydro reservoirs can be compared with the Keeyask
21 reservoir?
- 22 4. How long did it take other Manitoba Hydro reservoirs to stabilize, and what factors
23 influence this?
- 24 5. What model was used to predict Keeyask reservoir stabilization?
- 25 6. Recalculate and provide the time required for the Keeyask reservoir to stabilize
26 taking into account climate change, all other Manitoba Hydro current projects and
27 future projects on the Nelson River, etc.

28 **FOLLOW-UP QUESTION:**

29 Question 1: After 40 years of the Kettle Dam construction being completed..." Stephens
30 Lake shorelines are still undergoing peatland disintegration from Kettle reservoir
31 flooding." How is this considered a stable expansion process? This statement indicates
32 that the shorelines of Stephens Lake continue to be altered by peatland disintegration.
33 This change directly affects the immediate aquatic and terrestrial habitat. How will it
34 change the shoreline habitat dynamic in the proposed Keeyask reservoir? Question 2: "
35 Reservoir expansion is expected to continue at the lower relatively stable long-term rate

36 beyond year 30 of the project operation (i.e. expansion rate stabilizes, not reservoir
 37 size)." If the Keeyask reservoir is predicted to expand an extra 7 to 8 km² during the
 38 first 30 years of the operation (due to shoreline erosion), how much of the shoreline will
 39 erode inland after, "expansion rate stabilizes" ?

40 **RESPONSE:**

41 1. *After 40 years of the Kettle Dam construction being completed... " Stephens Lake*
 42 *shorelines are still undergoing peatland disintegration from Kettle reservoir*
 43 *flooding." How is this considered a stable expansion process?*

44 As explained in the response to CEC Rd 1 MB Wildlands-0073, stabilization refers to
 45 expansion rates rather than reservoir size. In fact, overall net expansion rates are
 46 expected to decline to nil for peatlands undergoing peatland disintegration processes in
 47 back bays.

48 2. *This statement indicates that the shorelines of Stephens Lake continue to be altered*
 49 *by peatland disintegration. This change directly affects the immediate aquatic and*
 50 *terrestrial habitat. How will it change the shoreline habitat dynamic in the proposed*
 51 *Keeyask reservoir?*

52 The effects of reservoir expansion on shore zone terrestrial habitat and wetlands along
 53 reservoir shorelines are addressed in Sections 2.3.6.3.1, 2.7.4.2 and 2.8.4.2 of the
 54 Terrestrial Environment Supporting Volume.

55 The effects of the Project on aquatic habitat in the reservoir are addressed in Section
 56 3.4.2.2 of the Aquatic Environment Supporting Volume.

57 3. *If the Keeyask reservoir is predicted to expand an extra 7 to 8 km² during the first 30*
 58 *years of the operation (due to shoreline erosion), how much of the shoreline will*
 59 *erode inland after, "expansion rate stabilizes" ?*

60 Shoreline recession and reservoir expansion beyond Year 30 of operation are discussed
 61 in the Physical Environment Supporting Volume (PE SV, Sec. 6.4.2.1.7 Project Effects
 62 Beyond Year 30), while Technical Memorandums GN 9.2.7 (Section 8.2, available on the
 63 CD provided with this submission) has discussion on additional expansion after Year 30.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
2 **Volume; Section: 2.7.4 Project Effects Mitigation and Monitoring;**
3 **Page No.: N/A**

4 **CEC Rd 2 MB Wildlands-0106**

5 **ORIGINAL PREAMBLE AND QUESTION (MB Wildlands-0076):**

6 The EIS materials indicate there will be no net project effects to overall ecosystem
7 diversity, stating that Keeyask activity will not change the total number of habitat types.
8 The assessment for impacts to regional inland broad habitat composition of existing
9 environment following construction is assessed for a 30 year period. Ecosystems are
10 systems that do not draw lines between aquatic and terrestrial habitat types, meaning
11 that a change to terrestrial ecosystems inevitably impacts aquatic ecosystems and vice
12 versa.

13 Please answer the following questions:

- 14 1. Were the effects to ecosystem habitat diversity measured solely based on the
15 number of habitats remaining after project construction?
16 a. What are the baseline values used for ecosystem habitat diversity
17 assessment?
18 b. Did Manitoba Hydro review other measures of ecosystem diversity, aside
19 from number of habitat types that are used for assessing effects to
20 ecosystem diversity?
21 c. Why was the study conducted to examine a 30-year period?
22 2. Did the terrestrial ecosystem effects mitigation and monitoring analysis incorporate
23 changes and effects predicted for the aquatic environment? If not, why not?
24 3. Did Manitoba Hydro perform a project effects mitigation and monitoring
25 analysis/report that includes both the terrestrial and aquatics information to assess
26 future impacts, mitigation measures and monitoring practices for each terrestrial
27 and aquatic ecosystem a. Include information for 30, 50 and 100 years of the
28 project lifespan.

29 **FOLLOW-UP QUESTION:**

30 Question 1 C: "The quantitative prediction period was 30 years because project effects
31 predictions were largely based on the examples provided by areas in Northern Manitoba
32 that have already been affected hydroelectric development." How much terrestrial and
33 aquatic environment in sq kilometers has been affected, directly and indirectly, by
34 hydroelectric development in Northern Manitoba? What will the total affect be on the
35 terrestrial and aquatic environment surrounding all current generation developments

36 and the proposed Keeyask site combined? Why is the construction period- pre 30
 37 years- omitted from the prediction period? Is this period of project effects excluded or
 38 omitted? Are connected transmission lines included in this report calculation? Over 30
 39 years? Over construction and 30 years?

40 Given that this 30 year impact period is simply the period of time the generation station
 41 and reservoir have been operating, provide indication of how Manitoba Hydro will
 42 monitor effects for 40, 50, 60 years after operation begins. Construction for each
 43 installation and transmission infrastructure. What models or tools does Manitoba
 44 Hydro use to compare effects between Hydro station, and reservoir?

45 Does Manitoba Hydro monitor and trace effects of each installation in an ongoing
 46 manner? Who has access to this infrastructure?

47 **RESPONSE:**

48 *Question 1 C: "The quantitative prediction period was 30 years because project effects*
 49 *predictions were largely based on the examples provided by areas in Northern Manitoba*
 50 *that have already been affected hydroelectric development." How much terrestrial and*
 51 *aquatic environment in sq kilometers has been affected, directly and indirectly, by*
 52 *hydroelectric development in Northern Manitoba?*

53 Please see Table 2-4 in the Terrestrial Environment Supporting Volume for the amount
 54 of terrestrial habitat directly and indirectly affected by past hydroelectric development
 55 and other large-scale human developments in the Terrestrial Habitat Regional Study
 56 Area. For the total land area affected by past hydroelectric development (1955 to 1994)
 57 in the Split Lake Cree Study Area (SLCSA) and the Split Lake Resource Management Area
 58 (SLRMA), see the response to CEC Rd 1 CEC-0035. The response to CEC Rd 2 CEC-0104
 59 explains why these land areas differ from the terrestrial habitat areas reported in the
 60 EIS.

61 The response to CEC Rd 1 CFLGC-0020 provides maps of flooding along the Nelson River
 62 from Gull Lake to Conawapa. As discussed in the Response to EIS Guidelines, the entire
 63 Nelson River has been affected by hydroelectric development. In addition, many
 64 tributaries and associated lakes experienced effects, due to flooding, backwater effects,
 65 and/or diversion.

66 *What will the total affect [sic] be on the terrestrial and aquatic environment surrounding*
 67 *all current generation developments and the proposed Keeyask site combined?*

68 For total effects on terrestrial environment surrounding all generation developments in
 69 the Regional Study Area, see the Terrestrial Environment Supporting Volume Section
 70 2.6.4.2.3 and CEC Rd 1 CEC-0021. For land areas affected by these developments in the
 71 SLRMA and Fox Lake Resource Management Area (FLRMA), , please see the response to

72 see CEC Rd 1 CEC-0035. Approximately 47 km² of river and lake habitat will be affected
73 by impoundment at the Keeyask Generating Station. This area is currently affected by
74 flow regulation as a result of Lake Winnipeg Regulation and Churchill River Diversion.

75 *Why is the construction period- pre 30 years- omitted from the prediction period? Is this*
76 *period of project effects excluded or omitted?*

77 The construction period is not omitted from the aquatic and terrestrial assessments.
78 The Project effects section for each VEC and supporting topic is sub-divided into the
79 construction and operation phases.

80 *(A)Are connected transmission lines included in this report calculation? Over 30 years?*
81 *Over construction and 30 years? (B)Given that this 30 year impact period is simply the*
82 *period of time the generation station and reservoir have been operating, provide*
83 *indication of how Manitoba Hydro wil monitor effects for 40, 50, 60 years after*
84 *operation begins. (C)Construction for each installation and transmission infrastructure.*
85 *What models or tools does Manitoba Hydro use to compare effects between Hydro*
86 *station, and reservoir?*

87 The wording of this series of questions is too ambiguous to provide a meaningful
88 response.

89 *Does Manitoba Hydro monitor and tracj effects of each installation in an ongoing*
90 *manner?*

91 Monitoring is conducted in relation to specific projects. For example, monitoring was
92 conducted throughout the construction phase of the recently completed Wuskwatim
93 Generation Project and is continuing during the operation phase.

94 *Who has access to this infrastructure?*

95 It is unclear what infrastructure and access is being referred to in the question.

1 **REFERENCE: Volume: Aquatic Environment Supporting Volume;**
2 **Section: 1A.3 Keeyask Operation; Page No.: N/A**

3 **CEC Rd 2 MB Wildlands-0107**

4 **ORIGINAL PREAMBLE AND QUESTION (MB Wildlands-0079):**

5 Over the operation period of the Keeyask Project, water levels will fluctuate to
6 accommodate the peak mode operation mandate of the station. The Lake Winnipeg
7 Water Regulation License is past due. Manitoba Hydro facilities are linked along the
8 Nelson River and through the Churchill River Diversion (CRD) originating from Lake
9 Winnipeg. The linked generation facilities impact one another, and therefore changes
10 to Lake Winnipeg outflow is relevant to the operations of the Keeyask Generation
11 Project.

12 Please respond to the following questions:

- 13 1. What are the intended min/max water levels within the Keeyask reservoir, spillway,
14 Stephens Lake and forebay?
- 15 2. What are the anticipated 10, 20, 30, 40 and 50-year impacts of altered water levels
16 on local topography and flooding?
- 17 3. How do the changing water levels within the Keeyask reservoir correlate with Lake
18 Winnipeg Water Regulation requirements for water level regulation?
- 19 4. How will Keeyask affect other components of the CRD?

20 **FOLLOW-UP QUESTION:**

21 Question 1: "The reservoir will fluctuate up to 1.0 m within any given day." Given a
22 continuous fluctuation in water levels daily in the Keeyask reservoir, what will happen to
23 the aquatic and terrestrial shoreline habitats as a result of 30 years of operation?

24 **RESPONSE:**

25 For changes to shore zone terrestrial habitat, including wetlands, please see Sections
26 2.3.6.3, 2.6.4.2 and 2.8.4.2 of the Terrestrial Environment Supporting Volume.

27 The effects of the Project on aquatic habitat in the reservoir are addressed in Section
28 3.4.2.2 of the Aquatic Environment Supporting Volume.

1 **REFERENCE: Volume: Aquatic Environment Supporting Volume;**
2 **Section: 2.3.3.2.1 Keeyask Environmental Studies; Page No.: N/A**

3 **CEC Rd 2 MB Wildlands-0108**

4 **ORIGINAL PREAMBLE AND QUESTION (MB Wildlands-0082):**

5 The EIS materials state that additional baseline water quality data for the Keeyask study
6 area was collected in 2009, but it was not incorporated into the description of the
7 existing environment.

8 Please respond to the following questions:

- 9 1. Why was the additional baseline water quality data not incorporated into the
10 description of the existing aquatic environment? Explain.
11 2. Provide the baseline aquatic data collected from 2009.

12 **FOLLOW-UP QUESTION:**

13 Question 1: "The results of the 2009 water quality sampling program were compared to
14 data collected in previous years and, because water quality was similar, a reanalysis of
15 the full dataset was not undertaken." How did KHLP specifically determine that the
16 water quality data collected from 2009 was comparable to other years and decide a re-
17 analysis was not necessary?

18 How will KHLP determine the status of water quality over time during planning,
19 construction and operation in light of the gap in analysis?

20 **RESPONSE:**

21 *"The results of the 2009 water quality sampling program were compared to data*
22 *collected in previous years and, because water quality was similar, a reanalysis of the full*
23 *dataset was not undertaken." How did KHLP specifically determine that the water*
24 *quality data collected from 2009 was comparable to other years and decide a re-analysis*
25 *was not necessary?*

26 As noted in the response to MB Wildlands-0082, additional water quality data collected
27 in 2009 were compared to data collected in earlier years that were incorporated into
28 the description of the existing environment for water quality.

29 This comparison is described in Savard, T. S. Hnatiuk-Stewart, and H.M. Cooley. 2010.
30 Water Quality Data for the Lower Nelson River System, Manitoba, 2009. Draft report
31 prepared for Manitoba Hydro by North/South Consultants Inc. 240 pp. Draft. Report 09-
32 04, provided as part of the response to MB Wildlands-0082. The 2009 results were

33 qualitatively compared to the means and ranges for water quality parameters measured
34 in 2001-2004 in the Study Area. Data collected in 2009 were also compared to
35 Manitoba Water Quality Standards, Objectives and Guidelines (MWQSOGs).

36

37 *How will KHLP determine the status of water quality over time during planning,*
38 *construction and operation in light of the gap in analysis?*

39 As discussed in the Aquatic Effects Monitoring Program (AEMP), data to describe
40 existing conditions were collected as part of the Keeyask environmental studies. Work
41 for most study components was conducted between 1999 and 2006. Additional
42 information was collected between 2006 and 2012, and the pre-Project data will be
43 updated again prior to the start of construction, depending on the timing of the last
44 sampling event. For logistical reasons, it is common for additional pre-Project data to be
45 collected in the interim between preparation of an EIS and initiation of Project
46 construction. Standard practice typically entails collation of all pre-Project data
47 available at the time of initiation of construction to form the pre-Project database for
48 monitoring.

49 The core water quality monitoring program will be conducted during both the
50 construction and operation phases, and will continue sampling at many of the sites
51 sampled during the EIS studies in the reach of the Nelson River that extends from Split
52 Lake, including inflows at the Nelson and Burntwood rivers (upstream reference sites)
53 through Stephens Lake. Results of water quality monitoring conducted during Project
54 construction and operation would be compared to MWQSOGs, to pre-Project water
55 quality data, and to water quality monitored upstream of Project effects.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 5.3.1**
2 **Regulatory Environmental Assessment Approach; Page No.: N/A**

3 **CEC Rd 2 MB Wildlands-0109**

4 **ORIGINAL PREAMBLE AND QUESTION (Mb Wildlands-0069):**

5 Selection of 18 biophysical VECs was based on the following criteria: - Overall
6 importance, value to people; - Key for ecosystem function; umbrella indicator;
7 amenable to scientific study in terms of analysis of conditions; potential for substantial
8 project affects; and regulatory requirements. The main benefits that humans obtain
9 from healthy ecosystem functioning are actually provided by ecosystem services, not
10 VECs. In the Executive summary, it is stated "that following mitigation none of the
11 residual adverse effects exceeded the regulatory test for significance".

12 Did the development of VECs and exceedance of adverse effects included assessments
13 pertaining to the ecosystem services and functions actually provided by the VEC.

14 **FOLLOW-UP QUESTION:**

15 Answer to IR # 68 is a Referral to answer to CAC 0011 Question 1. Quote from CAC 0011
16 "Project specific guidelines for the environmental assessment of the Keeyask Generation
17 Project were followed in the assessment of the project effects on the Physical
18 Environment." The EIS Guidelines for the Keeyask Generation project indicate that:
19 "The proponent must also indicate the specific geographical areas or ecosystems that
20 are of particular concern to interested parties, and the relationship of these areas to the
21 broader regional environment and economy." Explain how Manitoba Hydro fulfilled the
22 EIS Guidelines requirement above.

23 **RESPONSE:**

24 The concordance table provided at the front end of the Response to EIS Guidelines
25 demonstrates concordance between the EIS Guidelines and the Project's EIS. The
26 specific sections of the EIS that address the section of the EIS Guidelines referenced in
27 this Information Request can be found at the bottom of page ix.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
2 **Volume; Section: 2.0 Habitat and Ecosystems; Page No.: N/A**

3 **CEC Rd 2 MB Wildlands-0110a**

4 **ORIGINAL PREAMBLE AND QUESTION (MB Wildlands-0067):**

5 In table 2-1 (page 2-11) fine quality habitat types are discussed. Fine habitat types were
6 used to address specialized needs of VECs. The study documents that extensive habitat
7 classification and mapping was conducted, and occasionally to a fine scale. Did the
8 assessment goes the next level and provides how these classifications were used for
9 environmental assessment?

10 The VECs may not actually encompass the necessary services needed to maintain
11 ecosystem function and biodiversity and the services provided.

- 12 1. Specifically, were biodiversity and ecosystem services identified for the habitats
13 classified? Was this is done, or it was not done, and why? Answer for both above.
14 2. Which assessment approaches did Manitoba Hydro use to classify these services
15 and functions in order to address the specialized needs of the VECs? Are these
16 studies available to participants?

17 **FOLLOW-UP QUESTION:**

18 The Manitoba Hydro response indicates that: "fine habitat types were mapped in all
19 areas....." Has Manitoba Hydro provided these maps, and the charted data to
20 participants and the CEC ?

21 " The VECS may not actually encompass the necessary services needed to maintain
22 ecosystem function and the biodiversity and the services provided." Review answers to
23 IRs from participants and the CEC regarding VECs, ecosystems, ecosystem services and
24 functions, and biodiversity. Explain how M Hydro answers to these IRs agrees with the
25 statement above.

26 **RESPONSE:**

27 *The Manitoba Hydro response indicates that: "fine habitat types were mapped in all*
28 *areas....." Has Manitoba Hydro provided these maps, and the charted data to*
29 *participants and the CEC?*

30 The Terrestrial Environment Supporting Volume (Section 2.2.4.4) provides a description
31 of the hierarchical habitat classification system, including the applicability of each
32 classification level. Broad habitat type represents the finest level of detail presented in

33 the EIS (see TE SV Section 2.7). Fine habitat types were useful for specialized purposes in
34 the terrestrial assessment.

35 *“The VECS may not actually encompass the necessary services needed to maintain*
36 *ecosystem function and the biodiversity and the services provided.” Review answers to*
37 *IRs from participants and the CEC regarding VECs, ecosystems, ecosystem services and*
38 *functions, and biodiversity. Explain how M Hydro answers to these IRs agrees with the*
39 *statement above.*

40 Please see the response to CEC Rd 1 CAC-0011 for the Partnership’s approach to
41 ecosystem services.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
2 **Volume; Section: 2.0 Habitat and Ecosystems; Page No.: N/A**

3 **CEC Rd 2 MB Wildlands-0110b**

4 **ORIGINAL PREAMBLE AND QUESTION (MB Wildlands-0067):**

5 In table 2-1 (page 2-11) fine quality habitat types are discussed. Fine habitat types were
6 used to address specialized needs of VECs. The study documents that extensive habitat
7 classification and mapping was conducted, and occasionally to a fine scale. Did the
8 assessment go to the next level and provide how these classifications were used for
9 environmental assessment?

10 The VECs may not actually encompass the necessary services needed to maintain
11 ecosystem function and biodiversity and the services provided.

- 12 1. Specifically, were biodiversity and ecosystem services identified for the habitats
13 classified? Was this done, or it was not done, and why? Answer for both above.
14 2. Which assessment approaches did Manitoba Hydro use to classify these services
15 and functions in order to address the specialized needs of the VECs? Are these
16 studies available to participants?

17 **FOLLOW-UP QUESTION:**

18 " Specifically coarse habitat types were selected for beaver, moose, and caribou....."
19 Does the coarse habitat type selected apply to all types of caribou known to use the
20 RSA? Does the method described in the response to the IR only include " identification
21 of calving and rearing habitat on islands"? Does it include wintering areas and the
22 winter food supply for caribou?

23 **RESPONSE:**

24 Questions above are answered in turn.

25 *Does the coarse habitat type selected apply to all types of caribou known to use the*
26 *RSA?*

27 Yes, the coarse habitat types selected to model winter habitat apply to all types of
28 caribou known to use the Regional Study Area.

29 *Does the method described in the response to the IR only include " identification of*
30 *calving and rearing habitat on islands" ?*

31 To clarify, coarse habitat types were selected to model winter habitat. Important
32 summer habitat for caribou , such as calving and rearing habitat on islands in lakes and
33 islands in peatland complexes, was identified separately. Calving and rearing habitat was
34 classified as primary or secondary based on the size of islands in lakes or the size of the
35 peatland complex (see TE SV Section 7.3.6.3.3).

36 *Does it include wintering areas and the winter food supply for caribou?*

37 For the study areas considered in the environmental assessment, the winter habitat
38 model includes winter food supply and habitat use by caribou.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
2 **Volume; Section: 1.4.3 Effect Benchmarks; Page No.: N/A**

3 **CEC Rd 2 MB Wildlands-0111a**

4 **ORIGINAL PREAMBLE AND QUESTION (MB Wildlands-0074):**

5 The EIS materials indicate that there is no general or scientifically accepted benchmarks
6 for assessing terrestrial VECs or Supporting Topics.

7 Answer the following questions:

- 8 1. If there are no general or scientifically accepted regulatory benchmarks for
9 assessing terrestrial VECs or Supporting Topics, how are they assessed?
10 a. Does Manitoba Hydro apply its own internal benchmarks?
11 i. If so, what are those benchmarks and, how are they determined?
12 b. Are the benchmarks used by Manitoba Hydro comparable between
13 terrestrial VECs and Supporting Topics for Keeyask? Between other
14 Manitoba Hydro projects?
15 2. What is a benchmark as it pertains to VECs and Supporting Topics?

16 **FOLLOW-UP QUESTION:**

17 Ecosystem Benchmarks

18 The reference provided for response to the IR is : Environment Canada 2012, Recovery
19 Strategy for the woodland caribou, boreal population in Canada, 138 pgs. Manitoba
20 Hydro is asked to specify which of the COSEWIC and SARA reports and technical
21 documents regarding woodland caribou in Manitoba were used to answer this IR.
22 (There are several reports.)

23 Will Manitoba Hydro update its woodland caribou EIS content based on the final
24 National Recovery Strategy?

25 **RESPONSE:**

26 *Manitoba Hydro is asked to specify which of the COSEWIC and SARA reports and*
27 *technical documents regarding woodland caribou in Manitoba were used to answer this*
28 *IR. (There are several reports.)*

29 As indicated in the response to CEC Rd 1 MB Wildlands-0074, the Environment Canada
30 (2012) recovery strategy for boreal woodland caribou was used to answer this
31 Information Request. The recovery strategy was referenced in the portion of the
32 response specific to the caribou intactness benchmark.

33 *Will Manitoba Hydro update its woodland caribou EIS content based on the final*
34 *National Recovery Strategy?*

35 Information from the final strategy (Environment Canada 2012) has been included in the
36 responses to information requests (e.g., CEC Rd 1 MB Wildlands-0074, CEC Rd 1 CEC-
37 0037a), and is used to inform the existing effects assessment

38 **REFERENCES:**

39 Environment Canada. 2012. Recovery Strategy for the woodland caribou, boreal
40 population (*Rangifer tarandus caribou*) in Canada. Species at Risk Act Recovery
41 Strategy Series, Environment Canada, Ottawa, ON. 138pp.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
2 **Volume; Section: 1.4.3 Effect Benchmarks; Page No.: N/A**

3 **CEC Rd 2 MB Wildlands-0111b**

4 **ORIGINAL PREAMBLE AND QUESTION (MB Wildlands-0074):**

5 The EIS materials indicate that there is no general or scientifically accepted benchmarks
6 for assessing terrestrial VECs or Supporting Topics.

7 Answer the following questions:

- 8 1. If there are no general or scientifically accepted regulatory benchmarks for
9 assessing terrestrial VECs or Supporting Topics, how are they assessed?
10 a. Does Manitoba Hydro apply its own internal benchmarks?
11 i. If so, what are those benchmarks and, how are they determined?
12 b. Are the benchmarks used by Manitoba Hydro comparable between
13 terrestrial VECs and Supporting Topics for Keeyask? Between other
14 Manitoba Hydro projects?
15 2. What is a benchmark as it pertains to VECs and Supporting Topics?

16 **FOLLOW-UP QUESTION:**

17 Ecosystem Benchmarks

18 Question # 2 In response Manitoba Hydro used the term precautionary.

19 Does Manitoba Hydro and the partnership think that its EIS contents and technical
20 reports are precautionary, and apply the precautionary principle to the EIS Guidelines
21 for Keeyask Generation?

22 **RESPONSE:**

23 Note that this question goes beyond the scope of the initial question and its response.
24 For reference, the response to the original question 2 used the term "precautionary"
25 only as follows to explain how a "threshold" differed from a "benchmark" in the
26 terrestrial assessment:

27 "In the terrestrial assessment, a "threshold" is a point where the VEC or
28 supporting topic undergoes sudden, dramatic change. An effects benchmark is a
29 precautionary value, or range of values, for an indicator measure used for a VEC
30 or supporting topic that is below the level where a threshold is reached for the
31 specific a VEC or supporting topic."

34 **RESPONSE:**

35 Note that this question goes beyond the scope of the initial question and its response.
36 For reference, the response to the original question 2 used the term “precautionary”
37 only as follows to explain how a “threshold” differed from a “benchmark” in the
38 terrestrial assessment:

39 “In the terrestrial assessment, a “threshold” is a point where the VEC or
40 supporting topic undergoes sudden, dramatic change. An effects benchmark is a
41 precautionary value, or range of values, for an indicator measure used for a VEC
42 or supporting topic that is below the level where a threshold is reached for the
43 specific a VEC or supporting topic.”

44 The concordance table provided at the front end of the Response to EIS Guidelines
45 demonstrates concordance between the EIS Guidelines and the Project’s EIS. The
46 specific sections of the EIS that address the requirement to apply the precautionary
47 principle are outlined on pages xxix-xxx. Section 10.4 Precautionary Approach in the
48 Response to EIS Guidelines summarizes the Partnership approach to applying this
49 principle throughout the planning and design of the Project.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
2 **Volume; Section: 1.4.3 Effect Benchmarks; Page No.: N/A**

3 **CEC Rd 2 MB Wildlands-0112**

4 **ORIGINAL PREAMBLE AND QUESTION (MB Wildlands-0074):**

5 The EIS materials indicate that there is no general or scientifically accepted benchmarks
6 for assessing terrestrial VECs or Supporting Topics.

7 Answer the following questions:

- 8 1. If there are no general or scientifically accepted regulatory benchmarks for
9 assessing terrestrial VECs or Supporting Topics, how are they assessed?
10 a. Does Manitoba Hydro apply its own internal benchmarks?
11 i. If so, what are those benchmarks and, how are they determined?
12 b. Are the benchmarks used by Manitoba Hydro comparable between
13 terrestrial VECs and Supporting Topics for Keeyask? Between other
14 Manitoba Hydro projects?
15 2. What is a benchmark as it pertains to VECs and Supporting Topics?

16 **FOLLOW-UP QUESTION:**

17 We note the number of requests for definitions included in Participants' IRs, and the
18 high number of conservation biology terms being used in responding to IRs. Where in
19 the EIS materials is the glossary of all terms used in the EIS. Is there one single location
20 for definitions of terms used in the IR? The Manitoba Hydro response indicates that a
21 benchmark overall in project design was to "avoid increasing cumulative area losses to
22 more than 10% of the pre development area for every high priority habitat type." Were
23 high priority habitat types identified by zone, and by species need for the habitat types
24 using steps kept independent of any decision to use the 10% benchmark ?

25 Has this 10% benchmark also been applied to the LSA? Is it applied so that the planning,
26 construction, and operation periods are included? Does the EIS contain a detailed
27 listing of the habitat type review process, identification of the high priority, and priority
28 habitat types, with location, etc? Was any peer review, or independent review system
29 used to make sure that these two processes were done separately? Has Manitoba
30 Hydro used the same threshold for any of the project assessment? Does this volume of
31 the EIS contain definitions for the terms used in answering IR 74? Or are the definitions
32 located in an all in glossary for the whole EIS? Are these conservation biology, and
33 various benchmark terms all being used based on scientific definitions? If so, what is the
34 source for these definitions?

35 **RESPONSE:**

36 *We note the number of requests for definitions included in Participants' IRs, and the high*
37 *number of conservation biology terms being used in responding to IRs. Where in the EIS*
38 *materials is the glossary of all terms used in the EIS. Is there one single location for*
39 *definitions of terms used in the IR?*

40 The responses to Information Requests have attempted to use the same terminology
41 found in the EIS. Chapter 12 of The Response to EIS Guidelines provides the glossary of
42 terms used in that document. The Aquatic and Terrestrial Environment Supporting
43 Volumes each include a glossary. The reviewer is referred to these documents for
44 definitions of terms.

45 *The Manitoba Hydro response indicates that a benchmark overall in project design was*
46 *to "avoid increasing cumulative area losses to more than 10% of the pre development*
47 *area for every high priority habitat type."*

48 The rephrasing above changes the meaning of what was stated in the response to CEC
49 Rd 1 MB Wildlands-0043, which is reiterated here for context: "As a component of
50 Project design, one of the considerations was to avoid increasing cumulative area losses
51 to more than 10% of the pre-development area for every priority habitat type through
52 avoidance to the extent practicable and through area loss minimization where this was
53 not practicable."

54 *Were high priority habitat types identified by zone, and by species need for the habitat*
55 *types using steps kept independent of any decision to use the 10% benchmark ?*

56 Section 2.7.2 of the Terrestrial Environment Supporting Volume describes how the
57 priority habitat types were identified.

58 *Has this 10% benchmark also been applied to the LSA?*

59 The 10% benchmark is not relevant for the Ecosystem Diversity Local Study Area
60 because it is determined as a percentage of the Ecosystem Diversity Regional Study
61 Area.

62 *Is it applied so that the planning, construction, and operation periods are included?*

63 Yes.

64 *Does the EIS contain a detailed listing of the habitat type review process, identification of*
65 *the high priority, and priority habitat types, with location, etc?*

66 Section 2.7 of the Terrestrial Environment Supporting Volume describes how the priority
67 habitat types were identified, provides a listing of the priority habitat and includes maps
68 showing the distribution of priority habitat types.

69 *Was any peer review, or independent review system used to make sure that these two*
70 *processes were done separately? Has Manitoba Hydro used the same threshold for any*
71 *of the project assessment?*

72 The wording of these questions is too ambiguous to provide a meaningful response. It is
73 noted that the 10% value represents the moderate magnitude benchmark, determined
74 in the manner described in Section 2.7.2.4 of the Terrestrial Environment Supporting
75 Volume.

76 *Does this volume of the EIS contain definitions for the terms used in answering IR 74? Or*
77 *are the definitions located in an all in glossary for the whole EIS?*

78 The Terrestrial Environment Supporting Volume glossary contains definitions for
79 specialized terms used to respond to CEC Rd 1 MB Wildlands-0074.

80 *Are these conservation biology, and various benchmark terms all being used based on*
81 *scientific definitions? If so, what is the source for these definitions?*

82 Please see the response to CEC Rd 1 MB Wildlands-0043 for the approach to
83 determining definitions for the key concepts used in the assessment.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
2 **Volume; Section: Section: 2.0; Page No.: Table 2-34**

3 **CEC Rd 2 MB Wildlands-0113**

4 **ORIGINAL PREAMBLE AND QUESTION (MB Wildlands-0077):**

5 After 30 years of Keeyask project operation it is predicted the composition of inland
6 habitat will not dramatically change according to the EIS materials. The table shows
7 that after 30 years of operation total percent of land area will change from 98.5%
8 (existing regional study area habitat types) to 97.8% (year 30 of operation in regional
9 study area).

10 Answer the following questions:

- 11 1. What is the percent change of inland habitat over 30, 50 and 100 years within the
12 local study area, regional study area and project footprint?
- 13 2. Did the model used to predict change of the inland habitat factor in climate change,
14 increased human activity (having 2000 workers on site and using the surround
15 environment), waste deposit, altered flow of Nelson River, infrastructure
16 development, linear fragmentation by development of transmission lines, access
17 roads, dykes, shoreline erosion and changes to wildlife population?
- 18 3. Will Manitoba Hydro provide an updated table on the changes to inland habitat
19 from the Keeyask project factoring in the above-mentioned parameters?
- 20 4. Does inland habitat include all, any habitat types?

21 **FOLLOW-UP QUESTION:**

22 Question 1 If 72% of the habitat change is expected to be in the Project Footprint
23 explain how that relates to the LSA.

24 What % of the LSA, and the Project Footprint inland habitat will be affected by Keeyask
25 Generation project? Is the construction period left out of the "quantitative predictions
26 for the first 30 years of Project operation, and qualitative predictions thereafter to year
27 100"?

28 Or were the construction period effects on inland habitat calculated separately? Either
29 way, what is the quantitative prediction of effect on inland habitat for the LSA and
30 Project Footprint? 10 year period of construction effects, leaving out effects during the
31 construction period? Does Manitoba Hydro include recovery of inland habitat in its
32 prediction of effects, before fully identifying and predicting effects? That is, is recovery
33 of habitat in the 30 year period, after and up to 10 year period of construction effects,
34 leaving out effects during the construction period?

35 What is the potential Project Footprint? Has the project footprint been determined yet?
36 How are the effects of the previous infrastructure project – in a shared project area –
37 included in the prediction of quantitative effects?

38 Are monitoring results over 30 years included in the quantitative effects assessment?

39 **RESPONSE:**

40 *Question 1 If 72% of the habitat change is expected to be in the Project Footprint*
41 *explain how that relates to the LSA.*

42 The Project Footprint comprises 70% (13,010 ha out of 18,689 ha) of the Local Study
43 Area (Terrestrial Environment Supporting Volume, Section 1.3.5, Table 1-2).

44 *What % of the LSA, and the Project Footprint inland habitat will be affected by Keeyask*
45 *Generation project?*

46 The EIS assumes that 100% of inland habitat in the Project Footprint will be affected.
47 Total inland habitat directly and indirectly affected is provided by source of effect in the
48 Terrestrial Environment Supporting Volume Glossary, Section 2.3.6.3, Table 2-14. A total
49 of 72% of the LSA inland habitat is affected.

50 *Is the construction period left out of the “quantitative predictions for the first 30 years of*
51 *Project operation, and qualitative predictions thereafter to year 100”? Or were the*
52 *construction period effects on inland habitat calculated separately? Either way, what is*
53 *the quantitative prediction of effect on inland habitat for the LSA and Project Footprint?*
54 *10 year period of construction effects, leaving out effects during the construction period?*

55 The construction phase is included in the Project effects predictions, and is reported
56 separately from the operations phase. See the Terrestrial Environment Supporting
57 Volume, Sections 2.3.6, 2.6.4 and 2.7.4 for Project effects on inland habitat by Project
58 phase.

59 *Does Manitoba Hydro include recovery of inland habitat in its prediction of effects,*
60 *before fully identifying and predicting effects? That is, is recovery of habitat in the 30*
61 *year period, after and up to 10 year period of construction effects, leaving out effects*
62 *during the construction period?*

63 See the Terrestrial Environment Supporting Volume, Section 2.3.6.3.1 for a description
64 of how habitat recovery was incorporated into the Project effects predictions for the
65 construction and operation phases.

66 *What is the potential Project Footprint? Has the project footprint been determined yet?*

67 The potential project footprint is determined and described in the Terrestrial
68 Environment Supporting Volume, Sections 1.3.5 and 1.5.

69 *How are the effects of the previous infrastructure project – in a shared project area –*
70 *included in the prediction of quantitative effects?*

71 The Keeyask Infrastructure Project footprint, which falls entirely within the Project
72 Footprint, is classified as “human infrastructure” in the terrestrial habitat mapping. The
73 effects of the Keeyask Infrastructure Project are included as a cumulative effect in the
74 “Residual Effects” sections of Section 2 in the Terrestrial Environment Supporting
75 Volume.

76 *Are monitoring results over 30 years included in the quantitative effects assessment?*

77 Monitoring was not included in quantitative effects assessment since it will begin after
78 the Project is licensed.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
2 **Volume; Section: 2.7.4 Project effects mitigation and monitoring;**
3 **Page No.: N/A**

4 **CEC Rd 2 MB Wildlands-0114**

5 **ORIGINAL PREAMBLE AND QUESTION (MB Wildlands-0076):**

6 The EIS materials indicate there will be no net project effects to overall ecosystem
7 diversity, stating that Keeyask activity will not change the total number of habitat types.
8 The assessment for impacts to regional inland broad habitat composition of existing
9 environment following construction is assessed for a 30 year period. Ecosystems are
10 systems that do not draw lines between aquatic and terrestrial habitat types, meaning
11 that a change to terrestrial ecosystems inevitably impacts aquatic ecosystems and vice
12 versa.

13 Please answer the following questions:

- 14 1. Were the effects to ecosystem habitat diversity measured solely based on the
15 number of habitats remaining after project construction?
16 a. What are the baseline values used for ecosystem habitat diversity
17 assessment?
18 b. Did Manitoba Hydro review other measures of ecosystem diversity, aside
19 from number of habitat types that are used for assessing effects to
20 ecosystem diversity?
21 c. Why was the study conducted to examine a 30-year period?
22 2. Did the terrestrial ecosystem effects mitigation and monitoring analysis incorporate
23 changes and effects predicted for the aquatic environment? If not, why not?
24 3. Did Manitoba Hydro perform a project effects mitigation and monitoring
25 analysis/report that includes both the terrestrial and aquatics information to assess
26 future impacts, mitigation measures and monitoring practices for each terrestrial
27 and aquatic ecosystem
28 a. Include information for 30, 50 and 100 years of the project lifespan.

29 **FOLLOW-UP QUESTION:**

30 Predicted expansion of the reservoir for 30 years, and the actual size of the reservoir at
31 the 30 year point Is there expansion information available regarding the reservoir size
32 for any, all reservoirs that are beyond 30 years in operation ? What is the 100 year
33 figure based on?

34 Do other Hydro utilities use these same assessment parameters?

35 **RESPONSE:**

36 1. *Is there expansion information available regarding the reservoir size for any, all*
 37 *reservoirs that are beyond 30 years in operation?*

38 The mineral erosion and peatland disintegration models, which provide predictions of
 39 reservoir expansion, were developed using information from proxy reservoirs in
 40 northern Manitoba, including the Notigi and Kettle (Stephens Lake) reservoirs, which are
 41 similar to the Keeyask reservoir. Stephens Lake, which is located immediately
 42 downstream of the proposed Keeyask reservoir, was particularly relevant because it is
 43 the most ecologically comparable proxy area for conditions that are expected in the
 44 Keeyask reservoir and it had the best historical time series of information.

45 2. *What is the 100 year figure based on? Do other Hydro utilities use these same*
 46 *assessment parameters?*

47 The temporal scope for the terrestrial environment assessment is provided in the
 48 Terrestrial Environment Supporting Volume (Section 1.3.6 Temporal Scope), where it
 49 states that the temporal scope is as far into the future as needed to capture potential
 50 Project effects, but no less than 100 years after Project operation commences since this
 51 is the assumed life of the Project.

52 A cursory check of EIS documents for three recent, large hydro projects¹ was performed
 53 and found that time periods considered in the assessments varied and did not appear to
 54 be consistent among the projects.

¹ Site C Clean Energy Project in BC; Eastmain 1-A and Rupert Diversion in Quebec; and Lower Churchill Hydroelectric Generation Project in Newfoundland and Labrador.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 5.3.1**
2 **Regulatory Environmental Assessment Approach; Page No.: N/A**

3 **CEC Rd 2 MB Wildlands-0115**

4 **ORIGINAL PREAMBLE AND QUESTION (MB Wildlands-0068):**

5 Selection of 18 biophysical VECs was based on the following criteria: - Overall
6 importance, value to people; - Key for ecosystem function; umbrella indicator;
7 amendable to scientific study in terms of analysis of conditions; potential for
8 substantial project affects; and regulatory requirements.

9 The main benefits that humans obtain from healthy ecosystem functioning are actually
10 provided by ecosystem services, not VECs.

11 In the Executive summary, it is stated "that following mitigation none of the residual
12 adverse effects exceeded the regulatory test for significance". Did the development of
13 VECs and exceedance of adverse effects included assessments pertaining to the
14 ecosystem services and functions actually provided by the VEC.

15 **FOLLOW-UP QUESTION:**

16 The response to this IR does not answer the IR question regarding exceedance of
17 adverse effects. What regulatory test for significance is the proponent referring to? Is
18 there a standard with respect to the size of the RSA and the LSA and proportion of a VEC
19 affected? Which Manitoba Hydro uses?

20 Does Manitoba Hydro use the same regulatory test for significance for all project
21 assessments? Is there a guideline which project managers and consultants are directed
22 to use?

23 Given that mitigation steps are theoretical at this time, what does Manitoba Hydro use
24 as a standard or guideline to determine whether mitigation actions in fact do keep the
25 adverse environmental effects below the threshold for significance, therefore not
26 demonstrating exceedance? What mitigation steps will Manitoba Hydro take should
27 any mitigation steps not keep adverse effects from being significant? Will the Keeyask
28 environmental and monitoring plans identify any exceedances of adverse effects, and
29 put furthermeasures in place?

30 **RESPONSE:**

31 Each of the above questions are answered in turn.

32 *The response to this IR does not answer the IR question regarding exceedance of adverse*
33 *effects. What regulatory test for significance is the proponent referring to?*

34 The original question asks the following:

35 Did the development of VECs and exceedance of adverse effects included
36 assessments pertaining to the ecosystem services and functions actually
37 provided by the VEC.

38 CEC Rd 1 CAC-0011, which is referenced in the original response, indicates the
39 Partnership's approach to assessing effects on ecosystem services, including the role of
40 VECs in this assessment and does respond to this original question.

41 *Is there a standard with respect to the size of the RSA and the LSA and proportion of a*
42 *VEC affected? Which Manitoba Hydro uses?*

43 Each of the supporting volumes documents how the RSAs and LSAs for specific project
44 VECs were determined. The approach for determining these study areas is described in
45 Section 5.3.1 as follows:

46 **"STEP 2: SCOPE OF ASSESSMENT**

47 Spatial boundaries define the areas where the biophysical and socio-economic
48 studies were conducted (i.e., the study areas). The study area for each
49 environmental component (e.g., the physical environment, aquatic
50 environment, terrestrial environment) is defined by the geographic extent of
51 the direct and indirect effects of the Project. Where required, the study areas
52 extend beyond the zone of impact to provide context for the studies.

53 Study areas vary between environmental components to appropriately reflect
54 the extent of Project effects on that component (e.g., the study area for socio-
55 economic effects is larger than the study area for physical effects). Similarly, the
56 study areas for individual VECs and supporting topics within each environmental
57 component also vary as the study area for a species with a large home range
58 need to be larger than the study area for a more sedentary species. The study
59 areas selected are large enough to capture the effects of the Project, but not so
60 large as to mask the effects of the Project (by making the effects of the Project
61 as a percent of the area appear unreasonably small).

62 The majority of studies focused on the areas where the main impacts would
63 occur. For example, while the regional study area for heritage resources is quite
64 large, the heritage resource studies focus on the reach of the Nelson River
65 between the outflow at Clark Lake and the inflow into Stephens Lake (including
66 the north and south access roads, north and south dykes, and most borrow
67 areas) where the majority of disturbances would occur.

68 Detailed descriptions of the study areas and related temporal scope for each
 69 environmental component are provided in Section 6.2.3.2 (Physical
 70 Environment); Section 6.2.3.3 (Aquatic Environment); Section 6.2.3.4 (Terrestrial
 71 Environment); Section 6.2.3.5 (Socio-Economic Environment); Section 6.2.3.6
 72 (Resource Use); and Section 6.2.3.7 (Heritage Resources)."

73 *Does Manitoba Hydro use the same regulatory test for significance for all project*
 74 *assessments? Is there a guideline which project managers and consultants are directed*
 75 *to use?*

76 The approach to regulatory significance was determined by the Partnership based on
 77 the EIS guidelines issued by regulators. The factors considered for the assessment of
 78 significance are comparable to those used in many other assessments undertaken
 79 throughout Canada. As such, the approach implemented is similar to that used for the
 80 Wuskwatim Generation Project and the recent Bipole III Transmission Project. This
 81 approach is described in Section 5.5 of the Response to EIS Guidelines and in CEC Rd 2
 82 PFN-0072b.

83 *Given that mitigation steps are theoretical at this time, what does Manitoba Hydro use*
 84 *as a standard or guideline to determine whether mitigation actions in fact do keep the*
 85 *adverse environmental effects below the threshold for significance, therefore not*
 86 *demonstrating exceedance ?*

87 An Environmental Protection Program for the Project has been filed and is available on
 88 the Partnership's Website. This program includes a series of monitoring plans for each
 89 of the environments assessed – physical, aquatic, terrestrial, socio-economic, resource
 90 use and heritage resources. These plans have been designed to measure actual effects
 91 of the Project, test predictions, identify unanticipated effects and measure the
 92 effectiveness of mitigation measures to determine whether adaptive management
 93 measures are required. Please see Chapter 8 of the Response to EIS Guidelines and the
 94 responses to CEC Rd 1CAC-0061b and CEC Rd 1 MMF-0013 for further detail on the
 95 Partnership's approach to adaptive management.

96 *What mitigation steps will Manitoba Hydro take should any mitigation steps not keep*
 97 *adverse effects from being significant?*

98 Please see Section 8.1.3 of the Response to EIS Guidelines and the responses to CEC Rd
 99 1 CAC-0061b and CEC Rd 1 MMF-0013, which describe the adaptive management
 100 processes developed by the Partnership.

101 *Will the Keeyask environmental and monitoring plans identify any exceedances of*
 102 *adverse effects, and put furthermeasures in place?*

103 Please see Section 8.1.3 of the Response to EIS Guidelines and the responses to CEC Rd
104 1 CAC-0061b and CEC Rd 1 MMF-0013, which describe the adaptive management
105 processes developed by the Partnership.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 5.3.1**
 2 **Regulatory Environmental Assessment Approach; Page No.: N/A**

3 **CEC Rd 2 MB Wildlands-0116**

4 **ORIGINAL PREAMBLE AND QUESTION (MB Wildlands-0064):**

5 Selection of 18 biophysical VECs was based on the following criteria: Overall importance,
 6 value to people; key for ecosystem function; umbrella indicator; amendable to scientific
 7 study in terms of analysis of conditions; potential for substantial project affects; and
 8 regulatory requirements. The main benefits that humans obtain from healthy
 9 ecosystem functioning are actually provided by ecosystem services, not VECs. In the
 10 Executive summary, it is stated “that following mitigation none of the residual adverse
 11 effects exceeded the regulatory test for significance.” How is it being proposed that the
 12 development of VECs and exceedance of adverse effects included assessments
 13 pertaining to the ecosystem services actually provided by the VEC?

14 **FOLLOW-UP QUESTION:**

15 The response from Manitoba Hydro refers to ecosystem services. Given responses to
 16 other Participant IRs regarding VECs, and Biodiveristy which requested responses about
 17 ecosystem services Manitoba Hydro should provide its identification of the ecosystem
 18 services in the RSA and the LSA.

19 The reference to CAC 0011 maintains that effects assessment for each VEC captures
 20 cumulative effects to ecosystem services. Manitoba Hydro is asked to provide two
 21 examples, with the steps taken for two VECs that “captures cumulative effects to the
 22 ecosystem services” through the effects assessment for those VECs.

23 **RESPONSE:**

24 *The response from Manitoba Hydro refers to ecosystem services. Given responses to*
 25 *other Participant IRs regarding VECs, and Biodiveristy which requested responses about*
 26 *ecosystem services Manitoba Hydro should provide its identification of the ecosystem*
 27 *services in the RSA and the LSA. The reference to CAC 0011 maintains that effects*
 28 *assessment for each VEC captures cumulative effects to ecosystem services. Manitoba*
 29 *Hydro is asked to provide two examples, with the steps taken for two VECs that*
 30 *“captures cumulative effects to the ecosystem services” through the effects assessment*
 31 *for those VECs.*

32 As described in the response to CEC Rd 1 CAC-0011, the effects assessment does not
 33 specifically evaluate ecosystem services. Human benefits (i.e., ecosystem services) are
 34 either directly or indirectly represented by the KCNs evaluations or the socio-economic
 35 and resource use VECs and supporting topics.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
 2 **Volume; Section: 1.3.5 Spatial Scope; Page No.: Map 1-1 and Table**
 3 **1-3**

4 **CEC Rd 2 MB Wildlands-0117**

5 **ORIGINAL PREAMBLE AND QUESTION (MB Wildlands-0072):**

6 Study zones 1-6 were applied to the terrestrial environment to define areas for field
 7 work, research and comparison. Around each study zone, an additional buffer was
 8 applied that has a variable width depending on the zone. Each terrestrial VEC was
 9 evaluated in a local and regional study zone, however the local and regional study zones
 10 varied between VECs.

11 Answer the following questions:

- 12 1. What criteria were used to establish each terrestrial study zone? If no criteria were
 13 used, why not?
 14 2. What criteria were used to establish each terrestrial study zone buffer area? If no
 15 criteria were used, why not?
 16 3. How was the area and amount of land determined for each study zone and
 17 corresponding buffer area?
 18 4. Was there a model used to establish study zones and buffer areas?
 19 a. Is each zone/buffer area representative of a certain percent of the entire
 20 project study area?
 21 b. Are there certain terrestrial characteristics that were required within each
 22 zone and buffer area?
 23 c. How were the study zones and buffer areas determined and utilized to
 24 maximize/enhance VEC assessment?

25 **FOLLOW-UP QUESTION:**

26 Question 1 : " descriptions regarding how the study zones were delineated, please see
 27 the Terrestrial Supporting Volume." Specifically provide the location where the
 28 Terrestrial study zoning criteria can be found.

29 **RESPONSE:**

30 The original response to CEC Rd 1 MB Wildlands-0072 provided the answer to this
 31 question, and is re-iterated here, along with the original clarification of the incorrect
 32 statement in the preamble regarding study zone creation:

33 "As a clarification to the preamble, Study Zones 2 and 3 were the only study zones that
 34 were buffers of another area. Study Zone 2 represented the maximum potential Project

35 zone of influence on terrestrial habitat and Study Zone 3 represented the potential
36 Project zone of influence on landscape elements. The remaining larger study zones
37 represented nested ecosystem levels. Study Zone 5 was identified as the Keeyask
38 regional ecosystem. For descriptions regarding how the study zones were delineated,
39 please see the Terrestrial Environment Supporting Volume, **Sections 1.3.5 and 2.14.2...**”

1 **REFERENCE: Volume: Aquatic Environment Supporting Volume;**
2 **Section: N/A; Page No.: N/A**

3 **CEC Rd 2 MB Wildlands-0118**

4 **ORIGINAL PREAMBLE AND QUESTION (MB Wildlands-0084):**

5 Water bodies act as large natural sinks for sequestering anthropogenic carbon
6 emissions. Carbon enters the aquatic environment in the form of dissolved carbon
7 dioxide (CO₂), which then binds to calcium carbonates for sequestering. Dissolved CO₂
8 increases the acidity of the aquatic environment, which in turn slows calcium carbonate
9 precipitation, thereby decreasing the ability of the water to absorb CO₂.

10 Vertical deep mixing is a mechanism that then transports the sequestered carbon to the
11 deeper layers of the water column Aquatic plants play a significant role absorbing
12 dissolved carbon by converting it to organic material, and mitigating aquatic
13 acidification by converting CO₂ to oxygen during photosynthesis. In general, water
14 bodies play a significant role in the carbon cycles of the earth and in local ecosystems,
15 and must be considered when evaluating the impacts of carbon emissions on the
16 environment (terrestrial and aquatic).

17 Answer the following questions:

- 18 1. How will carbon emissions produced by the Keeyask Project during both the
19 construction and operation phases impact water carbon cycles?
20 2. What type of carbon inventory does Manitoba Hydro conduct regarding lakes,
21 rivers, peatlands and reservoirs; its projects areas?

22 **FOLLOW-UP QUESTION:**

23 Please refer to response to CEC Rd 1 PFN-0024 Section 2.5.2.2.6 : "There is some
24 indication that DOC increased in the offshore area of the north arm of Stephens Lake in
25 the initial years post-flood, but concentrations measured in recent years in the offshore
26 area are similar to those measured in the southern area of the lake and other sites on
27 the Nelson River." If the southern area of the lake and other sites on the Nelson River
28 were affected by reservoir flooding as well, how are the measurements comparable? If
29 they are comparable then is there data related to this statement that is current and not
30 from early 1970's?

31 Are Manitoba Hydro water quality and aquatic testing, monitoring and concentration
32 measurements only comparisons to aquatic areas previously affected by Hydro
33 Development?

34 **RESPONSE:**

35 As correctly noted above, the AE SV indicates that an analysis of available data for
36 Stephens Lake indicated that DOC likely increased in the north arm of Stephens Lake in
37 the initial years post-flood, but concentrations of DOC are now relatively similar in the
38 north arm and southern area of the lake (and other sites on the Nelson River). Please
39 refer to Appendix 2E Assessment Of Changes In Water Quality In Stephens Lake Since
40 1972 of the AE SV for a detailed description of data sources used and results of the
41 analysis of water quality data for Stephens Lake. In brief, the analysis entailed
42 compilation and review of water quality data collected in Stephens Lake from the 1970s
43 to 2004. The objective of the analysis was to evaluate changes in water quality over
44 time to assess temporal trends to be considered in the evaluation of effects of the
45 Keeyask Project as well as to assess potential changes to water quality that may have
46 occurred due to creation of Stephens Lake, which was used as a proxy as a further
47 source of information for assessing potential effects of the Keeyask Project.

48 The analysis compared water quality over time as well as spatially within the lake and to
49 upstream and downstream areas on the Lower Nelson River. These spatio-temporal
50 comparisons indicated that DOC concentrations were higher in the north arm of
51 Stephens Lake in the early 1970s, relative either to the southern area of the lake and
52 other locations on the Nelson River (i.e., spatial comparisons), and relative to DOC
53 concentrations measured in the 1980s, 1990s, and 2000s (i.e., temporal comparison).
54 Similarly, DOC concentrations measured in the southern area of Stephens Lake were
55 compared to sites located upstream and downstream of Stephens Lake (i.e., spatial
56 comparison) and over time (i.e., temporal comparisons). These comparisons also
57 included recent data. Comparisons of data collected in the early 1970s upstream and
58 downstream of and within Stephens Lake provide the most rigorous means for
59 evaluating effects of the Kettle GS on DOC concentrations in the lake – including the
60 southern area – as this data set represents the earliest record of water quality for the
61 lake following impoundment. Effects of the Kettle GS on water quality in the southern
62 area of Stephens Lake would be evident through comparisons to upstream water quality
63 conditions.

64 The Keeyask environmental studies program incorporated measurement of water
65 quality in an off-system lake (Assean Lake) to provide information on water quality in a
66 waterbody removed from the Nelson River and which has been unaffected by
67 hydroelectric development. Further, available water quality data collected from other
68 northern waterbodies, including the Hayes River which is also unaffected by
69 hydroelectric development, were also compiled and incorporated in the AE SV to
70 provide regional context. Lastly, water quality data collected from other areas of
71 Manitoba and Canada were incorporated to further assist with providing a context for
72 water quality conditions measured in the Keeyask study area.

1 **REFERENCE: Volume: Physical Environment Supporting Volume;**
 2 **Section: 2.1 Climate Change reference to IPCC 2001; 2.2.1.2 Future**
 3 **Climate Change Scenarios; Page No.: N/A**

4 **CEC Rd 2 PFN-0048**

5 **ORIGINAL PREAMBLE AND QUESTION (PFN-0007):**

6 The references for both the Climate Change and Climate Change future scenarios are
 7 out of date. Climate science and modeling has advance significantly since 2007 (the date
 8 of the IPCC's 4th assessment report). The earth's GHG emissions have already suppressed
 9 the " worst case" emissions scenario outlined in the 4th assessment report. This out-
 10 dated science is a major shortcoming of the assessment of the sensitivity to climate
 11 impacts.

12 1. Provide updated climate modeling, include IPCC worst-case data.

13 **FOLLOW-UP QUESTION:**

14 The proponent states that the 4th Assessment Report (coupled model intercomparison,
 15 CMIP3) is sufficient. This modeling is based on 2005/6 data and is a collection and
 16 summary of a selection of GHG emissions scenarios. Since even the most extreme
 17 emissions scenario from the CMIP3 (the A2 scenario) has already been exceeded, this is
 18 no longer a reliable indication of future climate conditions.

- 19 1. Explicitly, which of the emissions scenarios are you basing your analysis on and
 20 explain why this is a valid indication of future climate conditions?
 21 2. Does Manitoba Hydro intend to update its climate changes modeling?
 22 3. Would Manitoba Hydro indicate if it used the A2 scenario in CMIP3?

23 **RESPONSE:**

24 In the preamble, the intervener states that "Since even the most extreme emissions
 25 scenario from the CMIP3 (the A2 scenario) has already been exceeded, this is no longer
 26 a reliable indication of future climate conditions". The KHLP would like to provide
 27 clarification on the accuracy of this statement.

28 Atmospheric CO2 concentrations observed at Mauna Loa are below the highest
 29 Intergovernmental Panel on Climate Change (IPCC) emission scenario used in this
 30 environmental assessment¹. The A2 scenario is not the most extreme emissions scenario
 31 until the year 2050 when its global atmospheric carbon dioxide concentration exceeds
 32 that of the A1B scenario. The emission scenarios forcing the CMIP3 dataset are still a
 33 reasonable indication of future climate conditions as supported by the
 34 Intergovernmental Panel on Climate Change (IPCC) which states that " *atmospheric CO2*

35 *concentrations since 1990 have risen in line with projections from the SRES report"*
 36 (http://www.ipcc-data.org/observ/ddc_co2.html) (updated June 2013). These emissions
 37 scenarios are not intended to be exact predictions of the future but rather to provide a
 38 wide range of scenarios of projected future greenhouse gas emissions that encompasses
 39 some of the uncertainty related to future trends about demographic, social, economic,
 40 technological and environmental factors. These emission scenarios are prepared by the
 41 IPCC and are accepted by the global climate change modeling community as standard
 42 practice. These emission scenarios are updated by the IPCC when new information and
 43 technology becomes available and the ones used in the Keeyask environmental
 44 assessment are the most current emission scenarios published by the IPCC. Despite the
 45 inaccuracy of the statement in the Information Request, the KHLP would still like to
 46 address the questions presented and provides the following responses:

47 1. *Explicitly, which of the emissions scenarios are you basing your analysis on and*
 48 *explain why this is a valid indication of future climate conditions?*

49 As stated in PE SV Section 2.2.5.1 and CEC Rd 1 MB Wildlands 0050, Manitoba Hydro
 50 used all available emission scenarios (B1, A1B, and A2) that were used to drive the
 51 Global Climate Models (GCMs) and the Regional Climate Model (RCM). The B1, A1B,
 52 and A2 emission scenarios range from low to high carbon dioxide emissions. The IPCC
 53 states that all emission scenarios are equally valid and have no assigned probability
 54 (Carter, 2007). Therefore, the entire ensemble of 139 GCM simulations from AR4,
 55 including all three emission scenarios, was used to assess climate change.

56 2. *Does Manitoba Hydro intend to update its climate changes modeling?*

57 As stated in CEC Rd 1 PFN-0007, the KHLP used the most current IPCC Fourth
 58 Assessment Report- Coupled Model Intercomparison Project Phase 3 data in
 59 preparation of the Keeyask EIS. The new IPCC Fifth Assessment Report (AR5), which will
 60 use the Coupled Model Intercomparison Project Phase 5 (CMIP5) data, is scheduled to
 61 be released in 2014. The Keeyask environmental assessment is therefore based on the
 62 most current, internationally accepted data-set of climate change scenarios published
 63 by the IPCC. Furthermore, internationally recognized climate change experts from the
 64 Ouranos Consortium provided KHLP with the climate scenario methodology (as
 65 described by Carter, 2007), GCM and RCM data, and peer review of the climate
 66 scenarios developed.

67 3. *Would Manitoba Hydro indicate if it used the A2 scenario in CMIP3?*

68 See response to question 1.

69 ¹Dr. Pieter Tans, NOAA/ESRL (www.esrl.noaa.gov/gmd/ccgg/trends/)

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 5.3.1**
2 **Assessment Framework Steps; Page No.: N/A**

3 **CEC Rd 2 PFN-0049**

4 **ORIGINAL PREAMBLE AND QUESTION (PFN-0009):**

5 Study areas for each VEC's are variable and the reason given is to ensure that effects
6 described as a percentage of the area appear small.

7 1. Which methods and metrics did Manitoba Hydro consider before using the study
8 area per VEC approach in the EIS? 2) Why are affected areas (VECs) not calculated
9 as part of the LSA and RSA?

10 **FOLLOW-UP QUESTION:**

11 Misinterpreted IR: This wasn't said as the rationale in the EIS. There were rationale
12 provided, however these conveniently all ensure that the percentages remain small.
13 "The study areas selected are large enough to capture the effects of the Project, but not
14 so large as to mask the effects of the Project (by making the effects of the Project as a
15 percent of the area appear unreasonably small)."

16 If the proponent considers the data collected for some VECs unreasonably small, then
17 why didn't KHLP re-evaluate their approach to VECs?

18 **RESPONSE:**

19 There is no basis provided in the EIS, the responses to IRs, or this follow-up question for
20 suggesting that "the proponent considers the data collected for some VECs
21 unreasonably small" - and accordingly, there is no basis to respond to this follow-up
22 question.

23 The response to CEC Rd 1 PFN-0009 addressed a question on rationale for study areas.

24 To clarify, an alternative way of wording a response to the original question is as
25 follows.

26 · For each VEC, the size of the Local Study Area captured the potential Project zone of
27 influence on the VEC while the size of the Regional Study Area was selected to be
28 appropriate for the VEC. For example, the Local Study Area for a wildlife species was
29 large enough to capture the Project's effects on individual animals and their habitat
30 while the Regional Study Area was large enough to capture a population home
31 range for that VEC.

32 · In the response to CEC Rd 1 PFN-0009, the statement that “The study areas are large
33 enough to capture the effects of the Project” is intended to indicate that the Local
34 Study Area is large enough to capture the local Project effects. The rest of the
35 sentence (“but not so large as to mask the effects of the Project (by making the
36 effects of the Project as a percent of the area appear unreasonably small))”
37 recognizes a criticism made of some EISs that the regional study area used for the
38 assessment may be much larger than appropriate, which would give the impression
39 that effects were relatively small.

40 Please see the response to CEC Rd 2 CEC-0103a for further information on how study
41 area sizes were determined.

42 The Partnership considers the study area sizes and the amounts of data collected to be
43 appropriate for the VEC effects assessments.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 6.0**
2 **Environmental Effects Assessment; Page No.: Table 6-6**

3 **CEC Rd 2 PFN-0050a**

4 **ORIGINAL PREAMBLE AND QUESTION (PFN-0010):**

5 Summarized in relevant sections (of chapter 6) and in detail in the TE SV all of the
6 hydrological systems as far as zone 6 and beyond are physically connected.

- 7 1. Did Manitoba Hydro test different methods to determine LSAs and RSAs?
8 2. Were these LSA and RSA identified specifically so thresholds for change in habitat
9 would not be exceeded?
10 3. Will Manitoba Hydro provide a table for all VEC's showing total area lost, altered
11 and disturbed by construction, operation including residual effects and cumulative
12 effects across all 6 study zones (or at the very least for both LSA and RSA?)

13 **FOLLOW-UP QUESTION:**

14 See CEC Rd1 0022 and 0021: Why is there no quantified pre-development baseline
15 provided?

16 **RESPONSE:**

17 Table 1 of the response to CEC Rd 1 CEC-0021 quantifies pre-development conditions for
18 total terrestrial habitat, the priority habitat types and the indicator measures used for
19 intactness and wetland function. While some of the values in this table were explicitly
20 provided in the EIS, others were implicitly used to calculate the percentages reported in
21 the Terrestrial Environment Supporting Volume and/or to describe historical trends.

22 As described in the responses to CEC Rd 1 CEC-0021 and CEC Rd 1 CAC-0012, a different
23 approach was taken to the wildlife VECs because data were not available to determine
24 in any meaningful way the specific habitats that may have existed prior to industrialized
25 development for these VECs in the study areas. The approach taken for the wildlife VECs
26 was to describe historical change in the VEC indicators to the degree that information,
27 including ATK, was available, and to follow this characterization with a quantification of
28 how the Project is expected to affect available habitat during the construction phase
29 and the first 30 years of Project operation. The subsequent cumulative effects
30 assessment for a wildlife VEC was completed with the knowledge that these effects will
31 occur in a region where cumulative total terrestrial habitat loss is relatively low and
32 habitat intactness is high except along PR 280 and the Nelson River. Ultimately, the
33 focus of the assessment was on the future rather than on the past; that is, on examining
34 the vulnerability of each VEC today and in the future without the Project (due to
35 whatever factors might affect this vulnerability), in order to help in identifying the

- 36 extent to which incremental effects on a VEC from additional changes caused by the
- 37 Project could potentially result in a cumulative significant adverse effect on the VEC.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 6.0**
2 **Environmental Effects Assessment; Page No.: Table 6-6**

3 **CEC Rd 2 PFN-0050b**

4 **ORIGINAL PREAMBLE AND QUESTION (PFN-0010):**

5 Summarized in relevant sections (of chapter 6) and in detail in the TE SV all of the
6 hydrological systems as far as zone 6 and beyond are physically connected.

- 7 1. Did Manitoba Hydro test different methods to determine LSAs and RSAs?
- 8 2. Were these LSA and RSA identified specifically so thresholds for change in habitat
9 would not be exceeded?
- 10 3. Will Manitoba Hydro provide a table for all VEC's showing total area lost, altered
11 and disturbed by construction, operation including residual effects and cumulative
12 effects across all 6 study zones (or at the very least for both LSA and RSA?)

13 **FOLLOW-UP QUESTION:**

14 See CEC Rd 10022: How is it possible to avoid a true assessment of cumulative effects
15 (e.g. which include other Hydro projects and infrastructure) and still create the
16 appearance of no significant cumulative effects?

17 **RESPONSE:**

18 The EIS provides a valid assessment of cumulative effects for each VEC. Effects from all
19 past, current and potential future Hydro projects and activities that have spatial and
20 temporal overlap with effects of the Project on the VEC are considered when
21 determining the regulatory significance of the residual cumulative adverse effects of the
22 Project on a VEC (please see responses to CEC Rd 1 CEC-0022 and CEC Rd 2 CEC-0103a).

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 6.0**
2 **Environmental Effects Assessment; Page No.: Table 6-6**

3 **CEC Rd 2 PFN-0050c**

4 **ORIGINAL PREAMBLE AND QUESTION (PFN-0010):**

5 Summarized in relevant sections (of chapter 6) and in detail in the TE SV all of the
6 hydrological systems as far as zone 6 and beyond are physically connected.

- 7 1. Did Manitoba Hydro test different methods to determine LSAs and RSAs?
- 8 2. Were these LSA and RSA identified specifically so thresholds for change in habitat
9 would not be exceeded?
- 10 3. Will Manitoba Hydro provide a table for all VEC's showing total area lost, altered
11 and disturbed by construction, operation including residual effects and cumulative
12 effects across all 6 study zones (or at the very least for both LSA and RSA?)

13 **FOLLOW-UP QUESTION:**

14 The proponent draws a box around the ecosystems present in their RSA and suggests
15 that those ecosystems outside of that box aren't relevant.

- 16 1. Where is the data to support the Proponent's statement that Keeyask will not affect
17 the ecosystem outside of the study area?

18 **RESPONSE:**

19 No suggestion is being made that there are absolutely no effects outside of the Regional
20 Study Area, rather that the effects on those ecosystems or ecosystem components are
21 negligible. For example, the response to TAC Public Rd 1 EC-0032b explains that, while it
22 is possible Project-related highway traffic originating from Winnipeg will create wildlife
23 mortality or noise disturbance, these effects are expected to be negligible. Please see
24 the response to CEC Rd 1 CEC-0037a for further details.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 6.0**
2 **Environmental Effects Assessment; Page No.: Table 6-6**

3 **CEC Rd 2 PFN-0050d**

4 **ORIGINAL PREAMBLE AND QUESTION (PFN-0010):**

5 Summarized in relevant sections (of chapter 6) and in detail in the TE SV all of the
6 hydrological systems as far as zone 6 and beyond are physically connected.

- 7 1. Did Manitoba Hydro test different methods to determine LSAs and RSAs?
8 2. Were these LSA and RSA identified specifically so thresholds for change in habitat
9 would not be exceeded?
10 3. Will Manitoba Hydro provide a table for all VEC's showing total area lost, altered
11 and disturbed by construction, operation including residual effects and cumulative
12 effects across all 6 study zones (or at the very least for both LSA and RSA?)

13 **FOLLOW-UP QUESTION:**

14 This assessment uses ecosystems characteristics that ignore any potential effects from
15 existing and proposed projects, rather than taking into account existing and proposed
16 projects to assess any potential effects on ecosystems. They are not looking at
17 cumulative effects through the lens of Keeyask, rather than looking at Keeyask through
18 the lens of cumulative effects.

19 Why does KHLPP deem it unnecessary to account for potential effects that maybe be
20 caused by current and proposed Hydro projects? (In light of the CEC findings in their
21 Wuskwatim report.)

22 **RESPONSE:**

23 The question makes incorrect assertions that do not reflect what was done in the EIS, or
24 the responses provided to Round 1 Information Requests.

25 The regulatory significance of the Project's residual adverse effects are assessed by
26 considering the cumulative effects on each VEC of the Project combined with the effects
27 from all current and proposed hydroelectric projects that have spatial and temporal
28 overlap with the effects of Keeyask. Please see the responses to CEC Rd 1 CEC-0022 and
29 CEC Rd 2 CEC-0103a for additional information.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 6.3.12**
2 **Sensitivity of Project Effects to Climate Change; Page No.: 6-227**

3 **CEC Rd 2 PFN-0051**

4 **ORIGINAL PREAMBLE AND QUESTION (PFN-0011):**

5 The examination of the sensitivity to climate change focused on the operation phase as
6 the construction period will take place in the near term and climate change is a longer-
7 term phenomenon. The EIS references given are dated 2003 and 2007.

- 8 1. Why did Manitoba hydro ignore climate change scenarios and models available
9 since 2007?
10 2. Did Manitoba Hydro compare recent climate science to 2003, 2007 references and
11 choose older climate science?

12 **FOLLOW-UP QUESTION:**

13 The CEAA remains more out of date than the IPCC 4th assessment report. So much has
14 happened in the field of climate science in the last 10 years, this reference should no
15 longer be relied upon for upholding best practices. Verify that KHLP is using the most
16 recent climate change and scenarios data available.

17 **RESPONSE:**

18 As stated in CEC Rd 1 PFN-0011: In the Response to EIS Guidelines, Section 6.3.12, the
19 Canadian Environmental Assessment Agency (CEAA) (2003) reference, outlines the
20 general guidance to practitioners on incorporating climate change into project
21 environmental assessments. This guidance document is the most current one available
22 from CEAA. The document used to support methodology for future climate scenario
23 development came from the Carter (2007) reference, developed by the
24 Intergovernmental Panel on Climate Change's Task Group on Data and Scenario Support
25 for Impact and Climate Assessment (TGICA). The TGICA undertakes regular reviews of
26 their guideline documents and, when required, provides revisions and/or updates. This
27 guideline document, which supports the methodology used in the Keeyask
28 environmental assessment, is the most current one available from the IPCC's TGICA.

29 Please refer to the response to CEC Rd 2 PFN-0048 regarding the Partnership's use of
30 the most recent climate change and scenarios data available.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 6.3.12**
2 **Sensitivity of Project Effects to Climate Change; Page No.: 6-227**

3 **CEC Rd 2 PFN-0052**

4 **ORIGINAL PREAMBLE AND QUESTION (PFN-0012):**

5 The examination of the sensitivity to climate change focused on the operation phase as
6 the construction period will take place in the near term and climate change is a longer-
7 term phenomenon.

8 The EIS references given are dated 2003 and 2007.

- 9 1. Which IPCC 2007 model or scenario did Manitoba hydro use for the EIS?
10 2. What System does Manitoba Hydro use to update its engineers managers and
11 scientists regarding climate change?

12 **FOLLOW-UP QUESTION:**

13 "Between the years 2000-2009, growth in CO2 emissions from fossil fuel burning was,
14 on average, 3% per year, which exceeds the growth estimated by 34-35 of the 40 SRES
15 scenarios. Human-caused greenhouse gas emissions set a record in 2010, a 6% jump on
16 2009 emissions, exceeding even the "worst case" scenario," cited in the IPCC Fourth
17 Assessment Report. Explain why GHG emissions scenarios A1B and A2 do not reflect the
18 current trajectory of global greenhouse gas emissions.

19 **RESPONSE:**

20 The response to CEC Rd 2 PFN-0048 provides clarification on the reasons why the AR4
21 emission scenarios, including A1B and A2, are the most current internationally accepted
22 data-set of climate change scenarios published by the IPCC.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: Section**
 2 **6.9 – Effects of the Environment on the Project; Page No.: N/A**

3 **CEC Rd 2 PFN-0053**

4 **ORIGINAL PREAMBLE AND QUESTION (PFN-0014):**

5 The Project has been designed to safely pass the probable maximum flood (PMF).

- 6 1. How many times have Manitoba Hydro reservoir water levels exceeded PMF levels?
 7 2. How would climate change affect water levels for a 1:10,00 flood event for Keeyask?
 8 3. Has Manitoba Hydro run climate change models specific to worst-case scenarios for
 9 both floods and droughts?
 10 4. Do the conclusions in the EIS re: probable maximum flood correlate with recent
 11 climate change models—worst-case scenarios?

12 **FOLLOW-UP QUESTION:**

13 The proponent states in their IR response: "The estimated PMF for the Keeyask Project
 14 is nearly double the highest recorded daily average flow on record. As a result, reservoir
 15 water levels would not be expected to exceed estimated PMF levels." In the recent
 16 rainstorm in Toronto: "Environment Canada said some parts of the GTA had been
 17 drenched with more than 100 millimetres of rain, trouncing the previous one-day
 18 rainfall record of 29.2 mm in 2008 for Toronto and even beating the 74.4 mm monthly
 19 average for July." [Quote from Globe and Mail]. With the statement that has been
 20 made, does the proponent still think that they should not re-evaluate the PMF
 21 suggested in the EIS? Explain your reasoning.

22 **RESPONSE:**

23 It is assumed that the question is referring to a rainfall event that resulted in 126mm in
 24 7 hrs at Pearson Airport on July 8, 2013. This event is being compared to the record for
 25 July 8 for other years and does not consider larger rainfall events observed on days
 26 other than July 8, i.e. it does not consider events that occurred July 7 or July 9 or any
 27 other day of the year. While the rainfall event does set a new record for July 8, the
 28 previous 24 hour rainfall record for the month of July was 121.4mm observed during
 29 Hurricane Hazel in 1954. Contrary to the quote from the Globe and Mail which states
 30 that the previous record was trounced, the 2013 rainfall event is less than 4% higher
 31 than the previous record for July set in 1954.

32 The inflow design flood (IDF) estimate, selected as the PMF for Keeyask, is based on a
 33 number of factors, including the magnitude of extreme rainfall events experienced in
 34 the past. With each passing year, the estimate has the potential to be impacted by new
 35 extreme weather events. To help address this, Manitoba Hydro on behalf of the KHLP,

36 will conduct regular independent dam safety reviews during the operation phase of
37 Keeyask, as required under Manitoba Hydro's Dam Safety Program. The dam safety
38 reviews will include an assessment of the magnitude of the estimated PMF and the
39 ability of the Keeyask Project to safely discharge river flows up to the PMF.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
2 **Volume; Section: 1.3.4 Valued Environmental Components and**
3 **Supporting Topics; Page No.: 1-13**

4 **CEC Rd 2 PFN-0054**

5 **ORIGINAL PREAMBLE AND QUESTION (PFN-0015):**

6 The proponent states that those VEC's and STs selected were those that could
7 potentially experience substantial project effects yet the EIS Chapter 6 says all
8 significant effects to VECs and Supporting Topics were ultimately described as being
9 non-significant.

- 10 1. How did Manitoba Hydro decide whether a terrestrial concern was a ST or a VEC?
11 2. What is the technical and scientific basis for these determinations of non-significant
12 effects?

13 **FOLLOW-UP QUESTION:**

14 Provide the scientific basis behind The Response to the EIS Guidelines, Section 5.5
15 Approach to Determination of Regulatory Significance?

16 **RESPONSE:**

17 Section 5.5 sets out the overall approach to determination of regulatory significance.
18 The specific analysis conducted for each VEC is provided in Chapters 6 and 7 of the
19 Response to EIS Guidelines, which also references supporting volumes where relevant.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 6.5**
 2 **Terrestrial Environment; Page No.: N/A**

3 **CEC Rd 2 PFN-0055a**

4 **ORIGINAL PREAMBLE AND QUESTION (PFN-0016):**

5 The EIS indicates that effects of fragmentation and habitat losses are insignificant due to
 6 their being other habitat in the region. Significant, long term amphibious habitat losses
 7 (27%), within RSA is identified, yet it is stated that there are a lot of amphibians in the
 8 RSA since the project effects area represents small portion of regional study area.

- 9 1. What will Manitoba Hydro do to mitigate loss of 27% amphibian habitat?
 10 2. The reference to amphibians in the RSA: did Manitoba Hydro use recent scientific
 11 data regarding the rapid decline of amphibians in North America?

12 **FOLLOW-UP QUESTION:**

13 This IR response is an example of the proponent using the Zones to ensure that the
 14 percentage changes are small. Eg percent change in zone 3 = 27%, percent change in
 15 zone 4 = 3%, so they are using zone 4. How are off system marshes a proper way of
 16 mitigating the destruction of an untouched ecosystem? Explain your reasoning.

17 **RESPONSE:**

18 The two parts of this question are answered below.

19 *This IR response is an example of the proponent using the Zones to ensure that the*
 20 *percentage changes are small. Eg percent change in zone 3 = 27%, percent change in*
 21 *zone 4 = 3%, so they are using zone 4.*

22 Regarding the first sentence of the question, the size of the Amphibian Regional Study
 23 Area is appropriate for amphibians. Please see the responses to CEC Rd 1 CEC-0022, CEC
 24 Rd 2 CEC-0103a and CEC Rd 2 PFN-0049 for details on how the Regional Study Areas
 25 were determined.

26 *How are off system marshes a proper way of mitigating the destruction of an untouched*
 27 *ecosystem? Explain your reasoning.*

28 In response to the second part of this question, the presence of off-system wetlands
 29 (e.g., marsh) will not mitigate the loss of amphibian habitat resulting from Project
 30 construction and operation. Unaffected areas such as off-system wetlands will provide
 31 source populations for the colonization of new breeding habitats that may form along
 32 new roads, dykes and/or in decommissioned borrow pits (all of which will occur in Zone
 33 3). While declines in local amphibian populations are expected, Project effects on

- 34 regional populations are regionally acceptable, as approximately 97% of the amphibian
35 habitat in the RSA will remain unaffected by the Project.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 6.5**
2 **Terrestrial Environment; Page No.: N/A**

3 **CEC Rd 2 PFN-0055b**

4 **ORIGINAL PREAMBLE AND QUESTION (PFN-0016):**

5 The EIS indicates that effects of fragmentation and habitat losses are insignificant due to
6 their being other habitat in the region. Significant, long term amphibious habitat losses
7 (27%), within RSA is identified, yet it is stated that there are a lot of amphibians in the
8 RSA since the project effects area represents small portion of regional study area.

9 What will Manitoba Hydro do to mitigate loss of 27% amphibian habitat?

10 The reference to amphibians in the RSA: did Manitoba Hydro use recent scientific data
11 regarding the rapid decline of amphibians in North America?

12 **FOLLOW-UP QUESTION:**

13 Amphibian populations worldwide have been in decline due to, among other things,
14 habitat loss, pollution and climate change. Between a third and half of all amphibian
15 species are currently threatened with extinction. Being an amphibian species, and
16 given the dire context of amphibians globally, why is the Northern Leopard Frog not
17 considered a Valued Ecosystem Component?

18 **RESPONSE:**

19 See CEC Rd 1 CEC-0036 for information on the selection criteria used to determine
20 wildlife VECs. Although the historical range of the northern leopard frog includes the
21 RSA, none have been observed in recent decades. Due to weak Project linkages (low
22 potential to be affected by the Project), the northern leopard frog was screened out of
23 the VEC selection process. Instead, it was discussed in detail as a supporting topic
24 (priority amphibian⁵). The presence of northern leopard frog will be monitored (should
25 it occur) as part of the construction and operation amphibian monitoring plan (see
26 Section 4 of the Terrestrial Effects Monitoring Plan).

⁵ Priority amphibians are defined as those native species that are rare, ecologically sensitive in some way, near the outer limit of its range, a keystone species, critical to the survival or reproduction of another species and/or valued by people. A species is considered to be ecologically sensitive if it has low reproductive capacity, dependent on uncommon environmental conditions, dependent on the natural disturbance regime or highly sensitive to disturbance.

1 **REFERENCE: Volume: Physical Environment Supporting Volume;**
2 **Section: EIS Supplemental Filing 1 - 2012 Keeyask Traditional**
3 **Plants Workshop Summary; Page No.: 3**

4 **CEC Rd 2 PFN-0056**

5 **ORIGINAL PREAMBLE AND QUESTION (PFN-0001a,b):**

6 In deference to Aboriginal and Treaty rights for people of all ages to have access to the
7 land, changes in water level make it difficult to land a boat and access land along altered
8 shorelines. Shoreline erosion being predicted to carry on for many years confirms the
9 need for access

- 10 a. How will members of TCN, WLFN, FLCN and YFFN be supported to carry out
11 monitoring of their lands and medicinal plants in areas above proposed new water
12 levels during each phase of the project?
- 13 b. What is the plan to coordinate with knowledge holders in each community to
14 identify critical places where water access needs to be maintained? Does this plan
15 include shoreline remediation, riparian buffer and bank stabilization, dock building,
16 or other appropriate measures (detailed within a specific timeframe) to assure
17 Aboriginal and Treaty rights are supported not infringed?

18 **FOLLOW-UP QUESTION:**

19 Will "ATK monitoring involve the development and implementation of annual
20 monitoring programs.....related community concerns about potential effects" or not?
21 Please explain. How will the ATK contents and results from monitoring plans be
22 provided to regulators in order to assess the project and its licensing conditions? Please
23 answer the original IR question – with respect to areas above proposed new water
24 levels during each phase of the project.

25 **RESPONSE:**

26 The original response to CEC Rd 1 PFN-0001a stated: "It is expected that ATK monitoring
27 will involve the development and implementation of annual monitoring programs based
28 on construction and/or operational activities and related community concerns about
29 potential effects." ATK monitoring programs are still being negotiated with each of the
30 KCNs so the overall approach has not yet been finalized. The KCNs will determine what
31 is important to their respective communities to include in their project-specific
32 monitoring programs to assess the effects of the project.

33 Each of the KCNs will have the opportunity to prepare ATK monitoring reports for
34 submission to the regulator with all other monitoring reports required by the licences

35 issued for the Project. The Partnership cannot speak to how the regulator will use the
36 reported information to assess the Project and licensing conditions.

37 The original Information Request, CEC Rd 1 PFN 0001a was answered. It stated that,
38 "...each KCN will determine which parameters will be included in their plans. This may
39 or may not include medicinal plants in areas above proposed new water levels." The
40 KCNs will be funded by the Partnership to undertake their monitoring programs.

1 **REFERENCE: Volume: N/A; Section: EIS Supplemental Filing 1 -**
2 **2012 Keeyask Traditional Plants Workshop Summary; Page No.: 3**

3 **CEC Rd 2 PFN-0057**

4 **ORIGINAL PREAMBLE AND QUESTION (PFN-0001a,b):**

5 In deference to Aboriginal and Treaty rights for people of all ages to have access to the
6 land, changes in water level make it difficult to land a boat and access land along altered
7 shorelines. Shoreline erosion being predicted to carry on for many years confirms the
8 need for access.

- 9 a. How will members of TCN, WLFN, FLCN and YFFN be supported to carry out
10 monitoring of their lands and medicinal plants in areas above proposed new water
11 levels during each phase of the project?
- 12 b. What is the plan to coordinate with knowledge holders in each community to
13 identify critical places where water access needs to be maintained? Does this plan
14 include shoreline remediation, riparian buffer and bank stabilization, dock building,
15 or other appropriate measures (detailed within a specific timeframe) to assure
16 Aboriginal and Treaty rights are supported not infringed?

17 **FOLLOW-UP QUESTION:**

18 How will the Waterways Management Program information for the pre flooding and
19 post flooding period be: - provided to affected communities - made public and be
20 incorporated into ongoing monitoring and environmental management programming
21 for Keeyask? Was the Keeyask Waterways Management Program information filed with
22 the EIS for Keeyask? If not, why not, and will Manitoba Hydro file it now?

23 **RESPONSE:**

24 A Preliminary Environmental Protection Program (the Program) has been developed to
25 mitigate, manage and monitor potential environmental effects described in the Keeyask
26 Generation Project Response to EIS Guidelines during the construction and operation
27 phases of the Keeyask Generation Project. The Program includes a collection of plans
28 grouped in the following categories: Environmental Protection Plans, Environmental
29 Management Plans, and Environmental Monitoring Plans.

30 The Environmental Management Plans, for which the Waterways Management Program
31 falls, outline specific actions that must be taken during construction and into the
32 operational phase to mitigate Project effects. The management plans include
33 monitoring to determine success of the actions taken and to determine other actions
34 that need to be undertaken (adaptive management).

35 The activities that occur and the results generated from the Waterways Management
36 Program will be discussed at Monitoring Advisory Committee (MAC) meetings. The MAC
37 is an advisory committee to the Partnership Board of Directors and will review
38 outcomes of the program and, if appropriate, provide advice and recommendations to
39 the Partnership on additional monitoring or alternative mitigation measures that may
40 be required. The MAC is in the process of being established and will remain in existence
41 during operation and decommissioning of the Keeyask Generation Project. The MAC will
42 meet every two (2) months during construction and commissioning, unless otherwise
43 warranted by monitoring activities. During operations, meeting frequency will be
44 determined by the Board of the General Partner, provided that not less than two (2)
45 meetings per year will be held (JKDA Schedule 4-7). The MAC will provide a forum for
46 collaboration among all partners. On behalf of the Partnership, the MAC will also ensure
47 that the outcomes of the Environmental Protection Program are communicated more
48 broadly on an annual basis to Members of the KCNs, regulators and the general public.
49 This is described in Chapter 8 of the Response to EIS Guidelines.

50 The Waterways Management Program is included as Schedule 11-2 in the Joint Keeyask
51 Development Agreement (JKDA). The JKDA was signed by the four KCNs and Manitoba
52 Hydro in May of 2009 and is the legal framework defining the Partnership, its
53 responsibilities and obligations. The Waterways Management Program is also included
54 in the Response to EIS Guidelines as Appendix 4B, and the preliminary Environmental
55 Protection Program.

1 **REFERENCE: Volume: N/A; Section: EIS Supplemental Filing 1 -**
2 **2012 Keeyask Traditional Plants Workshop Summary; Page No.: 3**

3 **CEC Rd 2 PFN-0058**

4 **ORIGINAL PREAMBLE AND QUESTION (PFN-0002):**

5 Trees and plants have already been destroyed by hydro developments. The EIS states
6 people will have to go further to access intact (uncontaminated) medicinal plant areas.

7 Original Question: Answer the following questions:

- 8 1. Have suitable alternative plant gathering areas been located by traditional
9 knowledge keepers? Provide documents and/or plans to define "further" in distance
10 and time.
- 11 2. Has Hydro made a formal commitment to provide travel services, available on
12 demand, as the need to access medicinal plants is triggered by illness and accidental
13 injury? What limitations will interfere or prohibit travel arrangements?
- 14 3. Are provision in place for access coordinated around plant life cycles and harvest
15 times?

16 **FOLLOW-UP QUESTION:**

17 How will the Aboriginal rights to gather, hunt, track, and use crown lands and waters of
18 those Aboriginal citizens who are not members of the KCNs be accommodated? Do the
19 AEA offsetting programs negotiated include accommodating the Aboriginal rights of
20 other First Nations within the RSA, LSA, and with respect to the reservoir, and offsetting
21 programs? Do the various Agreements which the KCNs have negotiated with Manitoba
22 Hydro also acknowledge the rights of Aboriginal persons and communities who are not
23 KCNs?

24 **RESPONSE:**

25 Each of the above questions is answered below in turn.

- 26 1. *How will the Aboriginal rights to gather, hunt, track, and use crown lands and*
27 *waters of those Aboriginal citizens who are not members of the KCNs be*
28 *accommodated?*

29 It is the understanding of the Partnership that Aboriginal rights potentially impacted by
30 the Project will be explored and assessed through the Crown consultation process.

- 31 2. *Do the AEA offsetting programs negotiated include accommodating the Aboriginal*
32 *rights of other First Nations within the RSA, LSA, and with respect to the reservoir,*
33 *and offsetting programs? Do the various Agreements which the KCNs have*

34 *negotiated with Manitoba Hydro also acknowledge the rights of Aboriginal persons*
35 *and communities who are not KCNs?*

36 The Adverse Effects Agreements are specific to each of the KCNs and are not intended
37 to address the Aboriginal and treaty rights of other (non-KCN) Aboriginal communities.

1 **REFERENCE: Volume: N/A; Section: EIS Supplemental Filing 1 -**
2 **2012 Keeyask Traditional Plants Workshop Summary; Page No.: 5**

3 **CEC Rd 2 PFN-0059**

4 **ORIGINAL PREAMBLE AND QUESTION (PFN-0003):**

5 Medicinal plants are gathered for personal use from areas identified by families who
6 share that information within the bounds of personal relationships (plant location is not
7 generally shared or mapped, YFFN was determined not to share mapping information at
8 the 2012 workshop), and numerous areas of traditional harvest will be destroyed and/or
9 degraded.

10 Answer the following questions:

- 11 1. Are people from TCN, WLCN, FLCN and YFFN who harvest medicinal plants afforded
12 access to all newly identified medicinal plant locations?
13 2. Will communities share harvesting sites and coordinate within and between each
14 other to protect and manage these sites?
15 3. How has Hydro documented and communicated their commitment to finding a
16 solution regarding medicinal plants that is amenable to all parties?

17 **FOLLOW-UP QUESTION:**

18 These questions were not answered in Round 1. Cross reference to 002 not relevant as
19 answers are not provided. Please provide answers. Which KCN will have access to newly
20 identified medicinal plant locations? How is a newly identified medicinal plant location
21 confirmed by knowledgeable First Nation land users? How are the Aboriginal rights of
22 non KCN members going to be supported and accommodated with respect to gathering
23 medicinal plants?

24 **RESPONSE:**

25 *Which KCN will have access to newly identified medicinal plant locations? How is a*
26 *newly identified medicinal plant location confirmed by knowledgeable First Nation land*
27 *users?*

28 As stated in CEC Rd 1 PFN-0002 "The KCNs have negotiated AEA offsetting programs
29 that they feel best provide replacements, substitutions or opportunities to offset
30 unavoidable adverse effects of the Project. These include substitute opportunities to
31 carry out associated customs, practices and traditions integral to their cultural identity.
32 The KCNs have the ability to adapt these programs to meet their needs as they arise."

33 To further elaborate on this earlier response, each of the KCNs can choose to use their
34 AEA offsetting programs to access and identify plant locations. Each of the communities
35 have their own internal processes for confirming medicinal plant locations by
36 knowledgeable First Nations Members.

37 *How are the Aboriginal rights of non KCN members going to be supported and*
38 *accommodated with respect to gathering medicinal plants?*

39 Please see the response to CEC Rd 2 PFN-0058.

1 **REFERENCE: Volume: N/A; Section: EIS Supplemental Filing 1 -**
 2 **2012 Keeyask Traditional Plants Workshop Summary; Page No.: 4**

3 **CEC Rd 2 PFN-0060a**

4 **ORIGINAL PREAMBLE AND QUESTION (PFN-0004):**

5 Borrow pits from Hydro development (past and present) have been raised as a concern
 6 in all three medicinal plant workshops, as they have been left in a degraded state and
 7 lay bare for opportunistic grass and weeds—workshop participants have proposed these
 8 areas be restored in a balanced way with useful plants, including berries. Doing this
 9 would alleviate scars that remain visible on the landscape and could serve as part of an
 10 field-based educational science program, an expressed goal for communities.

11 Answer the following questions:

- 12 1. In number and surface area, what amount of land has been degraded by borrow pits
- 13 within the project area to date? And, amount planned over the next 10 years?
- 14 2. What percentage of that surface area has been restored to date in keeping with ATK
- 15 and practices, repeatedly shared in workshops since the first in 2009?
- 16 3. Is there a commitment in place to restore borrow pits in culturally appropriate
- 17 ways, going forward? What are the specific targets in scale and time.
- 18 4. Has Hydro dedicated funding specifically for classroom and field-based science
- 19 curriculum with regard to medicinal plant knowledge and plant conservation?

20 **FOLLOW-UP QUESTION:**

21 Re Question # 1 Provide an estimate of the size of the quarry and rock access sites in the
 22 river and lake identified in the EIS.

23 **RESPONSE:**

24 Page 34 of the Updates to Project Description provided as part of Supplemental Filing #2
 25 ([http://keeyask.com/wp/wp-content/uploads/2013/07/Supplemental-Filing-2-](http://keeyask.com/wp/wp-content/uploads/2013/07/Supplemental-Filing-2-Complete.pdf)
 26 [Complete.pdf](http://keeyask.com/wp/wp-content/uploads/2013/07/Supplemental-Filing-2-Complete.pdf)) illustrates the location and spatial extent of Quarry 7. Portions of this
 27 quarry encompass the north channel and a section of the middle channel of Gull Rapids.
 28 This quarry has a spatial area of approximately 240 ha; however, it is expected that
 29 much of the area will not be utilized. Quarry 7 will be inundated once the reservoir is
 30 impounded. All other rock quarries will be located on land.

1 **REFERENCE: Volume: N/A; Section: EIS Supplemental Filing 1 -**
2 **2012 Keeyask Traditional Plants Workshop Summary; Page No.: 4**

3 **CEC Rd 2 PFN-0060b**

4 **ORIGINAL PREAMBLE AND QUESTION (PFN-0004):**

5 Borrow pits from Hydro development (past and present) have been raised as a concern
6 in all three medicinal plant workshops, as they have been left in a degraded state and
7 lay bare for opportunistic grass and weeds—workshop participants have proposed these
8 areas be restored in a balanced way with useful plants, including berries. Doing this
9 would alleviate scars that remain visible on the landscape and could serve as part of an
10 field-based educational science program, an expressed goal for communities.

11 Answer the following questions:

- 12 1. In number and surface area, what amount of land has been degraded by borrow pits
13 within the project area to date? And, amount planned over the next 10 years?
- 14 2. What percentage of that surface area has been restored to date in keeping with ATK
15 and practices, repeatedly shared in workshops since the first in 2009?
- 16 3. Is there a commitment in place to restore borrow pits in culturally appropriate
17 ways, going forward? What are the specific targets in scale and time.
- 18 4. Has Hydro dedicated funding specifically for classroom and field-based science
19 curriculum with regard to medicinal plant knowledge and plant conservation?

20 **FOLLOW-UP QUESTION:**

21 Re Question # 3 Provide Manitoba Hydro and KCN standards to rehabilitate borrow pits
22 in a 'culturally appropriate way.' What does Manitoba Hydro mean 'Could include
23 restoration in culturally appropriate ways'?

24 What vegetation will be used to rehabilitate borrow pits in a culturally appropriate way?

25 Answer specifically with respect to the Main Camp Decommissioning contracts.

26 **RESPONSE:**

27 Section 5.27 of the Generating Station Construction Environmental Protection Plan
28 discusses the decommissioning and rehabilitation of the borrow pits and the main
29 camp. Additionally, input on culturally appropriate restoration will be discussed during
30 the upcoming Keeyask Plant field workshop with the KCNs to be held on August 20 and
31 21, 2013 in Gillam. Information from this workshop will be used to help develop the
32 Vegetation Rehabilitation Plan.

33 The Vegetation Rehabilitation Plan will be developed once construction is underway,
34 and the actual extent of disturbance caused by construction of the Keeyask Generation
35 Project is known. Detailed design and methodology for all rehabilitation areas, including
36 the main camp, will be carried out at that time, and the Partnership will provide the
37 draft plan to the regulator for review prior to finalization. Once ready, the plan will be
38 placed on the Partnership's website.

1 **REFERENCE: Volume: N/A; Section: EIS Supplemental Filing 1 -**
2 **2012 Keeyask Traditional Plants Workshop Summary; Page No.: 4**

3 **CEC Rd 2 PFN-0060c**

4 **ORIGINAL PREAMBLE AND QUESTION (PFN-0004):**

5 Borrow pits from Hydro development (past and present) have been raised as a concern
6 in all three medicinal plant workshops, as they have been left in a degraded state and
7 lay bare for opportunistic grass and weeds—workshop participants have proposed these
8 areas be restored in a balanced way with useful plants, including berries. Doing this
9 would alleviate scars that remain visible on the landscape and could serve as part of an
10 field-based educational science program, an expressed goal for communities.

11 Answer the following questions:

- 12 1. In number and surface area, what amount of land has been degraded by borrow pits
13 within the project area to date? And, amount planned over the next 10 years?
- 14 2. What percentage of that surface area has been restored to date in keeping with ATK
15 and practices, repeatedly shared in workshops since the first in 2009?
- 16 3. Is there a commitment in place to restore borrow pits in culturally appropriate
17 ways, going forward? What are the specific targets in scale and time.
- 18 4. Has Hydro dedicated funding specifically for classroom and field-based science
19 curriculum with regard to medicinal plant knowledge and plant conservation?

20 **FOLLOW-UP QUESTION:**

21 Re Question # 4 Will the Keeyask Centre be in place during construction and will
22 programming there as per your answer to the IR be in place during construction? Is the
23 Keeyask Centre operating now? What does the Keeyask Generation project or other
24 projects fund or provide at this Centre?

25 **RESPONSE:**

26 Construction of the Keeyask Centre is scheduled to commence in 2013 and is estimated
27 to be completed in 10 months. Under the Adverse Effects Agreement between TCN and
28 Manitoba Hydro, the Partnership provides TCN with annual funding for the associated
29 operation and maintenance costs, seven (7) offsetting programs and the staff. The
30 Centre provides the space and facilities to accommodate the staff and office functions
31 for the management and administration of the offsetting programs, including space for
32 display cases, the storage of supplies and equipment, for conducting educational and
33 learning programs, for fish processing and for other needs related to the management,
34 administration and implementation of the offsetting programs.

1 **REFERENCE: Volume: Physical Environment Supporting Volume;**
2 **Section: 2B-6 Greenhouse Gas Reporting and Commitments; Page**
3 **No.: N/A**

4 **CEC Rd 2 PFN-0061a**

5 **ORIGINAL PREAMBLE AND QUESTION (PFN-0008):**

6 The EIS states it is feasible to propose site-specific adaptation strategies that deal with
7 potential impacts of climate change on the local environment of Keeyask.

- 8 1. What are the site-specific adaptation strategies to deal with;
9 a. Medicinal plant locations?
10 b. Calving and wintering locations for caribou?
11 c. Migration of habitat types due to climate change?
12 d. Change in habitat locations for endangered species?
13 e. Additional listed and endangered species?

14 **FOLLOW-UP QUESTION:**

15 Will Manitoba Hydro have site specific climate adaptation strategies in place for the
16 Keeyask Generation Station project? This question pertains to roads, dikes, offices,
17 housing, cement operation, all vehicles, and all stages of construction and operation?

18 **RESPONSE:**

19 CEC Rd 2 PFN-0063 addresses a number of similar questions related to Manitoba
20 Hydro's climate change research and how the studies would be used for the Keeyask
21 Project.

22 As described in PESV Section 11.2, the effects of climate change are expected to be
23 negligible during the construction phase since it is planned to occur in the near future.
24 No climate adaptation strategies are planned for this reason.

25 The Physical Environment Supporting Volume Section 11.3 summarizes a sensitivity
26 analysis carried out to determine how changes to inflows due to climate change would
27 impact reservoir levels. Due to the design of the generating station, the reservoir
28 operating range of 158 m to 159 m would not change with either an increase or
29 decrease in Nelson River flows due to climate change. Higher flows would result in a
30 higher frequency of water levels in the upper part of this operating range and reduced
31 daily water level fluctuations within the operating range. Lower river flows would result
32 in more frequent fluctuations within the 1 m operating range.

33 It is recognized that over the long life of the project some infrastructure will require
34 maintenance or replacement for a variety of reasons. Section 4.6 of the Project
35 Description Supporting Volume summarizes the operating, maintenance and
36 surveillance procedures planned for the different Project components during the
37 operation phase to ensure the safe and efficient operation for the Project while
38 protecting the environment. The procedures that are outlined would also address the
39 impacts of climate change where it impacts the condition of infrastructure such that
40 safe and efficient operation of the Project is maintained.

1 **REFERENCE: Volume: Physical Environment Supporting Volume;**
2 **Section: 2B-6 Greenhouse Gas Reporting and Commitments; Page**
3 **No.: N/A**

4 **CEC Rd 2 PFN-0061b**

5 **ORIGINAL PREAMBLE AND QUESTION (PFN-0008):**

6 The EIS states it is feasible to propose site-specific adaptation strategies that deal with
7 potential impacts of climate change on the local environment of Keeyask.

- 8 2. What are the site-specific adaptation strategies to deal with;
- 9 a. Medicinal plant locations?
 - 10 b. Calving and wintering locations for caribou?
 - 11 c. Migration of habitat types due to climate change?
 - 12 d. Change in habitat locations for endangered species?
 - 13 e. Additional listed and endangered species?

14 **FOLLOW-UP QUESTION:**

15 Manitoba Hydro says it "will continue to advance the state of knowledge of climate
16 change impacts at the system wide scale....." Is that knowledge applied in the Keeyask
17 EIS and filings, and will the system wide knowledge of Manitoba Hydro re climate
18 change impacts be made available to Keeyask participants ?

19 **RESPONSE:**

20 See CEC Rd 2 PFN-0063, response to question 4. All material related to the Keeyask
21 project from these studies is summarized in the technical memoranda GN-9.5.1
22 *Historical Climate Analysis* and GN 9.5.2 *Future Climate Scenarios*, which were provided
23 to all Keeyask participants.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 5.3.1**
2 **Assessment Framework Steps; Page No.: N/A**

3 **CEC Rd 2 PFN-0062**

4 **ORIGINAL PREAMBLE AND QUESTION (PFN-0009):**

5 Study areas for each VEC's are variable and the reason given is to ensure that effects
6 described as a percentage of the area appear small.

- 7 1. Which methods and metrics did Manitoba Hydro consider before using the study
8 area per VEC approach in the EIS?
9 2. Why are affected areas (VECs) not calculated as part of the LSA and RSA?

10 **FOLLOW-UP QUESTION:**

11 Based on the IR round 1 answer advise the participants and the CEC where the EIS
12 Guidelines and regulatory framework direct the proponent not to use an ecosystem
13 framework to identify environmental effects for the combined project area and for
14 combined habitat and location for VECs.

15 **RESPONSE:**

16 The follow-up question does not relate in any meaningful way to the original round 1
17 question or response. The question is also unclear.

18 Please note that the aquatic and terrestrial environment assessments were conducted
19 using an ecosystem-based approach (see Aquatic Environment Supporting Volume,
20 Section 1.2 and Terrestrial Environment Supporting Volume, Section 1.1).

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 6.3.12**
 2 **Sensitivity of Project Effects to Climate Change; Page No.: 6-227**

3 **CEC Rd 2 PFN-0063**

4 **ORIGINAL PREAMBLE AND QUESTION (PFN-0012):**

5 The examination of the sensitivity to climate change focused on the operation phase as
 6 the construction period will take place in the near term and climate change is a longer-
 7 term phenomenon. The EIS references given are dated 2003 and 2007.

- 8 1. Which IPCC 2007 model or scenario did Manitoba hydro use for the EIS?
 9 2. What System does Manitoba Hydro use to update its engineers managers and
 10 scientists regarding climate change?

11 **FOLLOW-UP QUESTION:**

- 12 • How will Manitoba Hydro keep its climate change scenario and modeling for
 13 Keeyask up to date during the construction phase - and what is the plan to be up to
 14 date regarding climate change prior to operation of Keeyask Generation Station ?
 15 • What are Manitoba Hydro's ' established climate change strategies that shape the
 16 organization's to climate change' ?
 17 • How did the department in Manitoba Hydro studying climate change 'update
 18 decision makers' regarding the Keeyask project ?
 19 • What are Manitoba Hydro's climate change impact studies ? Are these studies
 20 available to Keeyask participants? Provide a listing of these studies.
 21 • Provide a listing of any climate change studies Ouranos undertook for Manitoba
 22 Hydro.
 23 • You have referenced Manitoba Hydro's Climate Change Strategies in answering IR
 24 0012. Were any of the results of Manitoba Hydro's Research Management Board's
 25 climate change projects applied to planning for Keeyask ?
 26 • Will any of the results of these various research, and statistical projects be applied
 27 to construction or operations for Keeyask ?
 28 • If the intention is for the outcomes from these projects to be applied to the
 29 construction or operation phases of Keeyask please provide full information about
 30 these climate change projects.
 31 • Please provide Keeyask participants and the CEC with the details of the climate
 32 change research, statistical and downscaling projects currently underway through
 33 the Manitoba Hydro Research Management Board – as these are relevant for the
 34 future operations of Keeyask, and connected projects. (Referenced in the EIS and
 35 in IR 0012 response.)

- 36 · Given these climate change programs and investments with Ouranos and others as
 37 per PE SV Appendix 2 B are paid for with public funds, and revenues of a public
 38 utility please advise the reporting mechanism regarding these climate change
 39 programs, and research projects.

40 **RESPONSE:**

41 Each of the above questions are answered in turn.

- 42 1. *How will Manitoba Hydro keep its climate change scenario and modeling for*
 43 *Keeyask up to date during the construction phase - and what is the plan to be up to*
 44 *date regarding climate change prior to operation of Keeyask Generation Station ?*

45 Observation of climatic conditions will be ongoing to provide modeling feedback over
 46 time. When the new CMIP5 data has been evaluated and published in the
 47 Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report (AR5),
 48 Manitoba Hydro will consider the IPCC's recommendation on its use for climate scenario
 49 development in its ongoing corporate climate change impact studies (See Manitoba
 50 Hydro Climate Change Report¹).

- 51 2. *What are Manitoba Hydro's 'established climate change strategies that shape the*
 52 *organization's to climate change'?*

53 Manitoba Hydro has established the following five climate change strategies:

- 54 · Understanding the Changing Climate
- 55 · GHG Measurement and Reporting
- 56 · Contribute to GHG Emission Reductions
- 57 · Support GHG Policy and Market Development
- 58 · Adapt and plan.

59 See Manitoba Hydro Climate Change Report for additional details¹.

- 60 3. *How did the department in Manitoba Hydro studying climate change 'update*
 61 *decision makers' regarding the Keeyask project ?*

62 The departments studying climate change at Manitoba Hydro regularly updates its
 63 engineers and managers by presenting current developments in climate change
 64 research at departmental, divisional and executive meetings. Throughout the
 65 environmental assessment process, several workshops were also held to update all the
 66 environmental project teams.

- 67 4. *What are Manitoba Hydro's climate change impact studies ? Are these studies*
 68 *available to Keeyask participants? Provide a listing of these studies.*

69 See Manitoba Hydro Climate Change Report¹.

70 5. *Provide a listing of any climate change studies Ouranos undertook for Manitoba*
71 *Hydro.*

72 Ouranos provided expert advice, technical support, methodology recommendation,
73 global and regional climate model data, and expert peer review of both climate change
74 technical memoranda; GN-9.5.1 *Historical Climate Analysis* and GN-9.5.2 *Future Climate*
75 *Scenarios*.

76 6. *You have referenced Manitoba Hydro's Climate Change Strategies in answering IR*
77 *0012. Were any of the results of Manitoba Hydro's Research Management Board's*
78 *climate change projects applied to planning for Keeyask?*

79 The results from the Research and Development projects are not directly applicable to
80 planning of Keeyask. The objective of these projects is to improve our understanding of
81 climate change science, tools, and methodology to support the overall corporate
82 climate change strategies described in the Manitoba Hydro Climate Change Report.

83 7. *Will any of the results of these various research, and statistical projects be applied to*
84 *construction or operations for Keeyask?*

85 If any of the research and development project results are relevant to Keeyask, they will
86 be considered for future studies related to Keeyask. At this time, the Research and
87 Development projects are still ongoing and specific components can not be identified.

88 8. *If the intention is for the outcomes from these projects to be applied to the*
89 *construction or operation phases of Keeyask please provide full information about*
90 *these climate change projects.*

91 See Manitoba Hydro Climate Change Report¹.

92 9. *Please provide Keeyask participants and the CEC with the details of the climate*
93 *change research, statistical and downscaling projects currently underway through*
94 *the Manitoba Hydro Research Management Board – as these are relevant for the*
95 *future operations of Keeyask, and connected projects. (Referenced in the EIS and in*
96 *IR 0012 response.)*

97 See Manitoba Hydro Climate Change Report¹.

98 10. *Given these climate change programs and investments with Ouranos and others as*
99 *per PE SV Appendix 2 B are paid for with public funds, and revenues of a public utility*
100 *please advise the reporting mechanism regarding these climate change programs,*
101 *and research projects.*

102 All projects conducted by Ouranos are publicly available through their website.

103 <http://www.ouranos.ca/en/default.php>.

104

105 Different research projects are subject to different agreements with the researchers
106 including without limitation different obligations respecting confidentiality and publicity.

107 As such Manitoba Hydro does not publish all the research and development projects

108 unconditionally to the public. As prescribed on Manitoba Hydro's Research and

109 Development website any member of the public wanting information on any area of
110 research is welcome to inquire with the Research and Development manager.

111 (http://www.hydro.mb.ca/corporate/research_and_development.shtml?WT.mc_id=212

112 6)

113 ¹ This report is included with the CD of technical reports provided with this filing.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 6.5**
2 **Terrestrial Environment; Page No.: N/A**

3 **CEC Rd 2 PFN-0064a**

4 **ORIGINAL PREAMBLE AND QUESTION (PFN-0016):**

5 The EIS indicates that effects of fragmentation and habitat losses are insignificant due to
6 their being other habitat in the region. Significant, long term amphibious habitat losses
7 (27%), within RSA is identified, yet it is stated that there are a lot of amphibians in the
8 RSA since the project effects area represents small portion of regional study area.

- 9 1. What will Manitoba Hydro do to mitigate loss of 27% amphibian habitat?
10 2. The reference to amphibians in the RSA: did Manitoba Hydro use recent scientific
11 data regarding the rapid decline of amphibians in North America?

12 **FOLLOW-UP QUESTION:**

13 Is Manitoba Hydro suggesting that the loss of 27 % of the amphibians in Zone 4 from
14 Keeyask project effects is not a significant or relevant effect of the project?

15 Is Manitoba Hydro suggesting that all amphibians are able to recover their population
16 and habitat by moving into decommissioned burrow pits?

17 In Which zone are these de commissioned burrow pits which will provide habitat for
18 recovering amphibian populations located?

19 **RESPONSE:**

20 To clarify, 3% of the available amphibian habitat in Zone 4 will be lost or degraded as a
21 result of the Project (see the response to CEC Rd 1 PFN-0016 for an explanation of why
22 the loss is 3% and not 27%). This loss (although less than the reported 27%) is
23 considered relevant and important, like all Project effects.

24 See CEC Rd 2 PFN-0055a for answers to the remaining two questions regarding borrow
25 areas.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 6.5**
 2 **Terrestrial Environment; Page No.: N/A**

3 **CEC Rd 2 PFN-0064b**

4 **ORIGINAL PREAMBLE AND QUESTION (PFN-0016):**

5 The EIS indicates that effects of fragmentation and habitat losses are insignificant due to
 6 their being other habitat in the region. Significant, long term amphibious habitat losses
 7 (27%), within RSA is identified, yet it is stated that there are a lot of amphibians in the
 8 RSA since the project effects area represents small portion of regional study area.

- 9 1. What will Manitoba Hydro do to mitigate loss of 27% amphibian habitat?
 10 2. The reference to amphibians in the RSA: did Manitoba Hydro use recent scientific
 11 data regarding the rapid decline of amphibians in North America?

12 **FOLLOW-UP QUESTION:**

13 Is Manitoba Hydro suggesting that 'rapid declines in North America amphibian
 14 populations occurred only during the 1970's?

15 Did Manitoba Hydro use the decline of amphibians in Manitoba in the period between
 16 1970 and 2005 for the basis of this area of the EIS?

17 **RESPONSE:**

18 In developing the EIS, the Partnership considered both the rapid declines that occurred
 19 in the 1970s, and the general, global declines in amphibian populations that continue to
 20 be observed to this day. In the TE SV Section 5.3.3, the Partnership acknowledges that a
 21 general decline in frog populations, including species that occur or have occurred in the
 22 Project Study Area, has been observed worldwide over the past 40 years (Conservation
 23 International 2004; Stuart et al. 2004).

24 **REFERENCES:**

25 Conservation International (2004). Amphibians in dramatic decline; study finds nearly
 26 one-third of species threatened with extinction. Science Daily. Retrieved July 22,
 27 2010, from <http://www.sciencedaily.com/releases/2004/10/04015103700.htm>

28 Stuart, S.N., Chanson, J.S., Cox, N.A., Young, B.E., Rodrigues, S.L., Fischman, D.L., &
 29 Waller, R.W. 2004. Status and trends of amphibian declines and extinctions
 30 worldwide. Science, 306: 1783-1786.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 6.5**
 2 **Terrestrial Environment; Page No.: N/A**

3 **CEC Rd 2 PFN-0065**

4 **ORIGINAL PREAMBLE AND QUESTION (PFN-0018):**

5 The range of natural variability appears to be used as a reassurance that significant
 6 effects whenever and wherever found, are natural.

- 7 1. How did Manitoba Hydro determined the natural range of variability, and why are
 8 they sure that changes to VEC's and supporting topics don't vary significantly?
 9 2. Why did Manitoba hydro use different indicators for different VEC's without a
 10 technical explanation?
 11 3. Provide a table for all VECs
 12 4. Would Manitoba Hydro provide clear rationale for determinance of percent range
 13 or other predicted changes being insignificant or within natural range of variability?

14 **FOLLOW-UP QUESTION:**

15 Question 4 Not answered. Please provide answer to the question. Does Manitoba
 16 Hydro use any other source than a twenty year old CCFM set of forest criteria and
 17 indicators to provide a basis for answer to this question? Why did Manitoba Hydro not
 18 cite or use the 2006 and 2008 updates to these CCFM indicators and criteria?

19 **RESPONSE:**

20 Please see the response to CEC Rd 1 MB Wildlands-0074 for the general approach to
 21 how the benchmark values or ranges for the VEC indicator measures were determined.
 22 As noted in that response, effects benchmarks may vary between VECs and supporting
 23 topics because they represent different ecosystem components and/or because they
 24 use different indicators (e.g., the intactness benchmark for caribou habitat intactness is
 25 different than the one used for the intactness VEC because caribou is more sensitive to
 26 human disturbance than most other species). For this reason, the response to CEC Rd 1
 27 PFN-0018 identifies the thirteen EIS sections that provide the rationale used to
 28 determine the benchmark values or ranges used when applying the significance criteria
 29 for each VEC.

30 Regarding the reference to CCFM 1995, there was a clerical error in the response to CEC
 31 Rd 1 PFN-0018. The reference section, which only included CCFM 1995, should not have
 32 been included in the response as no references are cited in the text. Numerous sources
 33 were used to select the benchmark values or ranges used when applying the significance
 34 criteria for each VEC. These sources are provided in the thirteen EIS sections cited in the
 35 response to CEC Rd 1 PFN-0018.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: N/A;**
2 **Page No.: N/A**

3 **CEC Rd 2 PFN-0066a**

4 **ORIGINAL PREAMBLE AND QUESTION (PFN-0020):**

5 Please answer the following questions:

- 6 1. What is Manitoba Hydro’s definition of natural variability?
- 7 2. How is sensitivity to disturbance assessed? Methodology?
- 8 3. How is VEC capacity to change assessed?
- 9 4. Why were geese and ducks (pg. 630, 633) not evaluated further despite text
- 10 describing adverse, long term impacts to their habitat?

11 **FOLLOW-UP QUESTION:**

12 Question # 1 The reference in answer to this IR is provided as Terrestrial Environment
 13 Supporting Volume Section 1.4.3 In the IR response Manitoba Hydro provides this
 14 reference which a list of Effects Benchmarks and says ‘the types of benchmarks used
 15 were :’ (see list) In the Reference within the volume Section 1.4.3 Manitoba Hydro
 16 indicates that there is a “ lack of generally accepted scientific
 17 standards.....benchmarks used to assess Project effects varied depending onone
 18 or more of the following:” (see same list) Explain the difference in the above
 19 statements, and explain then which of the items in the list were used to arrive at effects
 20 assessment for each VEC etc for Keeyask. Provide clear statements as to which specific
 21 example of the elements in this list were used for each VEC assessment. In particular
 22 provide a listing of the detailed sources for each of the elements in this list. Original
 23 question was NOT answered. Manitoba Hydro definition of natural variability, which is
 24 in the list, should be provided.

25 **RESPONSE:**

26 Each of the above questions is answered below.

27 *Question # 1 The reference in answer to this IR is provided as Terrestrial Environment*
 28 *Supporting Volume Section 1.4.3 In the IR response Manitoba Hydro provides this*
 29 *reference which a list of Effects Benchmarks and says ‘the types of benchmarks used*
 30 *were :’ (see list) In the Reference within the volume Section 1.4.3 Manitoba Hydro*
 31 *indicates that there is a “ lack of generally accepted scientific*
 32 *standards.....benchmarks used to assess Project effects varied depending onone*
 33 *or more of the following:” (see same list) Explain the difference in the above*
 34 *statements, and explain then which of the items in the list were used to arrive at effects*
 35 *assessment for each VEC etc for Keeyask. Provide clear statements as to which specific*



36 *example of the elements in this list were used for each VEC assessment. In particular*
37 *provide a listing of the detailed sources for each of the elements in this list.*

38 Please see the response to CEC Rd 1 MB Wildlands-0074 for the information requested
39 above.

40 *Original question was NOT answered. Manitoba Hydro definition of natural variability,*
41 *which is in the list, should be provided.*

42 The meaning of natural variability is described in the response to CEC Rd 1 PFN-0020.
43 The EIS uses this term to identify variability in environmental parameters originating
44 from natural sources. Of course, there is no longer anywhere on earth that is entirely
45 pristine, so natural variability incorporates some degree of anthropogenic influence.
46 Consequently, areas or populations that have been relatively unaffected by human
47 activity are used to measure natural variability. Please see response to CEC Rd 1 MB
48 Wildlands-0075 for an explanation of what is meant by relatively unaffected by human
49 activity.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 6.5**
2 **Terrestrial Environment; Page No.: N/A**

3 **CEC Rd 2 PFN-0066b**

4 **ORIGINAL PREAMBLE AND QUESTION (PFN-0020):**

5 The range of natural variability appears to be used as a reassurance that significant
6 effects whenever and wherever found, are natural.

- 7 1. How did Manitoba Hydro determined the natural range of variability, and why are
8 they sure that changes to VEC's and supporting topics don't vary significantly?
9 2. Why did Manitoba hydro use different indicators for different VEC's without a
10 technical explanation?
11 3. Provide a table for all VECs
12 4. Would Manitoba Hydro provide clear rationale for determinance of percent range
13 or other predicted changes being insignificant or within natural range of variability?

14 **FOLLOW-UP QUESTION:**

15 Question # 4 There is no answer to the question regarding geese in this IR. First Nation
16 hunters in other regions of Manitoba utilize the same goose resource in their hunt.
17 Explain how the access and rights to this resource for Aboriginal hunters will be
18 maintained despite the admitted adverse, long term impacts to their habitat?

19 **RESPONSE:**

20 The Keeyask Project is not anticipated to have an effect on the regional Canada goose
21 population. Goose breeding and rearing habitat will not be affected by the Project as
22 suitable habitat does not occur within the LSA. The Project will reduce the quality of
23 staging habitat within the LSA; however, alternate staging habitat is available in areas
24 within and outside of the RSA. Once the Project is operational, local resource users may
25 need to alter the locations where they traditionally hunt geese; however, access to and
26 harvest of this resource by users outside of the LSA is not expected to change as a result
27 of the Project.

1 **REFERENCE: Volume: Aquatic Environment Supporting Volume;**
 2 **Section: 2.5 Water Quality; Page No.: N/A**

3 **CEC Rd 2 PFN-0067a**

4 **ORIGINAL PREAMBLE AND QUESTION (PFN-0024):**

5 Water bodies act as large natural sinks for sequestering anthropogenic carbon
 6 emissions. Carbon enters the aquatic environment in the form of dissolved carbon
 7 dioxide (CO₂), which then binds to calcium carbonates. Dissolved CO₂ increases the
 8 acidity of the aquatic environment, which in turn slows calcium carbonate precipitation,
 9 thereby decreasing the ability of the water to absorb CO₂. Vertical deep mixing is a
 10 mechanism that then transports the sequestered carbon to the deeper layers of the
 11 water column. Aquatic plants play a significant role absorbing dissolved carbon by
 12 converting it to organic material, and mitigating aquatic acidification by converting CO₂
 13 to oxygen during photosynthesis. Water bodies play a significant role in the carbon
 14 cycles of the earth and in local ecosystems, and must be considered when evaluating
 15 the impacts of carbon emissions on the environment (terrestrial and aquatic). Within
 16 the EIS materials there is limited discussion on the role water plays in the carbon cycle,
 17 and how modification to the aquatic environment, terrestrial activities, effluent
 18 discharge and flooding of peatland as a result of the Keeyask Project, will influence
 19 carbon emissions.

20 Please respond to the following questions:

- 21 1. How will the Keeyask Project influence the process of vertical mixing and
 22 sedimentation within the Keeyask reservoir and Stephens Lake?
- 23 2. How will the flooding of peatlands increase the amount of dissolved carbon within
 24 the aquatic environment?
- 25 3. How will change in flow regime of the Nelson River impact carbon cycles?
- 26 4. Did Manitoba Hydro conduct a cumulative carbon cycle analysis for the construction
 27 and operation phases of the Keeyask Project, which incorporates both terrestrial
 28 and aquatic carbon cycle data and mechanisms?

29 **FOLLOW-UP QUESTION:**

30 Question# 1 was not answered. Provide an answer with respect to Keeyask reservoir,
 31 and Stephens Lake (reservoir).

32 **RESPONSE:**

33 The response to CEC Round 1 PFN-0024 discussed the influence of the Project on
 34 vertical mixing based on three dimensional modeling performed as part of the physical
 35 environment studies (Physical Environment Supporting Volume (PE SV), Section 9). It is

36 also noted that much of the post-Project reservoir will be well mixed in winter due to
37 river flows. Newly formed back bays that have low velocities and are not as well mixed
38 will experience reduced vertical mixing during the ice cover period since the ice cover
39 prevents wind induced vertical mixing. In the existing environment, the majority of the
40 upstream area is considered to be well mixed at all times due primarily to the flow
41 conditions in this reach of the Nelson River. Some localized off-current areas may
42 experience reduced mixing during infrequent, very low wind periods and in winter for
43 the existing environment.

44 The response to CEC Round 1 PFN-0024 did not discuss Project effects on vertical mixing
45 in Stephens Lake. The Project's open water hydraulic zone of influence extends
46 approximately 5 km downstream of the dam into Stephens Lake (PE SV, Sec. 4.2.3). This
47 area was not modeled as part of the study considered in Section 9 of the PE SV.
48 However, in the narrower riverine section immediately downstream of the Project,
49 discharge from the generating station is expected to maintain vertically well-mixed
50 conditions, similar to the well mixed conditions identified from model results for the
51 mainstem of the Keeyask reservoir. In the existing environment, this riverine section
52 immediately downstream of Gull Rapids is well mixed due to flow. Further downstream
53 in the Project's open water hydraulic zone of influence and in the rest of Stephens Lake,
54 there are negligible to no changes in velocity and flow patterns due to the Project (see
55 PE SV, Map 4.4.10); therefore, the Project would not be expected to meaningfully affect
56 vertical mixing in these areas.

57 Regarding Project effects on sedimentation, information is provided in relevant sections
58 of the Keeyask EIS. The Response to EIS Guidelines Section 6.2 Existing Environment,
59 Subsection 6.2.3.2.8 Sedimentation; and Section 6.3 Effects and Mitigation Physical
60 Environment, Subsection 6.3.8 Sedimentation summarizes the more detailed discussion
61 of sedimentation found in the PE SV (Section 7 Sedimentation).

1 **REFERENCE: Volume: Aquatic Environment Supporting Volume;**
 2 **Section: 2.5 Water Quality; Page No.: N/A**

3 **CEC Rd 2 PFN-0067b**

4 **ORIGINAL PREAMBLE AND QUESTION (PFN-0024):**

5 Water bodies act as large natural sinks for sequestering anthropogenic carbon
 6 emissions. Carbon enters the aquatic environment in the form of dissolved carbon
 7 dioxide (CO₂), which then binds to calcium carbonates. Dissolved CO₂ increases the
 8 acidity of the aquatic environment, which in turn slows calcium carbonate precipitation,
 9 thereby decreasing the ability of the water to absorb CO₂. Vertical deep mixing is a
 10 mechanism that then transports the sequestered carbon to the deeper layers of the
 11 water column. Aquatic plants play a significant role absorbing dissolved carbon by
 12 converting it to organic material, and mitigating aquatic acidification by converting CO₂
 13 to oxygen during photosynthesis. Water bodies play a significant role in the carbon
 14 cycles of the earth and in local ecosystems, and must be considered when evaluating
 15 the impacts of carbon emissions on the environment (terrestrial and aquatic). Within
 16 the EIS materials there is limited discussion on the role water plays in the carbon cycle,
 17 and how modification to the aquatic environment, terrestrial activities, effluent
 18 discharge and flooding of peatland as a result of the Keeyask Project, will influence
 19 carbon emissions.

20 Please respond to the following questions:

- 21 5. How will the Keeyask Project influence the process of vertical mixing and
 22 sedimentation within the Keeyask reservoir and Stephens Lake?
 23 6. How will the flooding of peatlands increase the amount of dissolved carbon within
 24 the aquatic environment?
 25 7. How will change in flow regime of the Nelson River impact carbon cycles?
 26 8. Did Manitoba Hydro conduct a cumulative carbon cycle analysis for the construction
 27 and operation phases of the Keeyask Project, which incorporates both terrestrial
 28 and aquatic carbon cycle data and mechanisms?

29 **FOLLOW-UP QUESTION:**

30 Questions # 3 and # 4

31 A reference is made to Technical Memorandum GN 9.5.5, and 9.5.6 are as being
 32 provided on the CD which contained Technical Memoranda.

33 Advise whether there is an accessible table of contents and listing of these both alpha
 34 and numeric. Given that the technical reports for the Keeyask EIS have neither an alpha

35 listing by title or authors, and were not included in the EIS in 2012 Manitoba Hydro
36 needs to provide accessible listings of materials it includes in filings on a timely basis.

37 Manitoba Hydro should advise the participants and the CEC why these technical
38 Memoranda were not provided with the EIS.

39 **RESPONSE:**

40 All of the available environmental study reports and technical memoranda associated
41 with the EIS are listed in tabular format in Appendix 6A of the Response to EIS
42 Guidelines. An updated version of the table in Appendix 6A was provided in the Errata
43 filed by the Partnership as part of Supplemental Filing #1 in April 2013. This updated
44 version was also provided as an attachment to the response to CEC Rd 1 CFLGC-0011. In
45 addition to providing a full reference for each of the environmental study reports and
46 technical memoranda, Appendix 6A also includes information on the status of the
47 report.

48 All of the reports listed in Appendix 6A are available upon request. Several of these
49 reports have also been provided through the TAC/Public and CEC Information Request
50 processes to supplement responses to the questions received. In these cases, separate
51 CDs of technical reports have been provided with each specific filing and these technical
52 reports have been uploaded to the Partnership's Web site along with the responses.
53 There are a few cases where a technical report not referenced in the EIS has also been
54 provided based on the specific question being asked in the Information Request. These
55 are included in the listed technical reports provided on the Website with each response
56 filing.

57 The reports listed in Appendix 6A represent the various study reports and memoranda
58 developed by the Keeyask environmental study team through over ten year of EIS
59 studies. They were used to develop the assessment presented in the final EIS, but do not
60 form part of the formal EIS filing and, for this reason, were not filed with the EIS. These
61 reports are akin to the published documents also referenced in the EIS submission. Since
62 these reports are not generally available to reviewers in the same way as the referenced
63 published documents, they are being made available by the Partnership to provide
64 interested reviewers with more detail on the information used to reach assessment
65 conclusions.

1 **REFERENCE: Volume: Aquatic Environment Supporting Volume;**
 2 **Section: 1.2.2.4 Selection of VECs; Page No.: Table 1-1**

3 **CEC Rd 2 PFN-0068**

4 **ORIGINAL PREAMBLE AND QUESTION (PFN-0027):**

5 VECs are selected in order to act as indicators of ecosystem health. Aquatic VECs
 6 selected include; water quality, walleye, northern pike, lake sturgeon and lake whitefish.
 7 All other potential VECs were not selected on the basis that they were not deemed
 8 important for resource use by local people.

9 The fish species selected as VECs are higher up in the foodchain, and therefore will take
 10 longer to respond to subtle changes in the aquatic environment compared to other
 11 ecosystem components. Furthermore, quantifying simply the number of fish in a given
 12 area is not a measure of ecosystem or VEC health. Specific parameters of the VEC aside
 13 from mercury concentrations must be assessed; reproductive capability, size, general
 14 health, etc, need to be measured and the culmination of those measured results be
 15 compared in a matrix to determine overall VEC health.

16 Please answer the following questions:

- 17 1. Explain the rationale behind selecting only the ecosystem components that are
 18 regarded as important for resource as the aquatic VECs? a. How does this rationale
 19 support the purpose of selecting VECs to monitor and measure ecosystem health?
 20 2. Are the VECs selected strong/appropriate indicators of ecosystem health? Explain.
 21 3. What parameters of the VECs are being measured to determine the health and
 22 vitality of the VEC?
 23 a. Provide the data in matrix format off what particular biological parameters
 24 of each VEC are being measured and how those parameters are being
 25 quantified for comparison to baseline data?

26 **FOLLOW-UP QUESTION:**

27 Question # 3 There is a reference to ' post project monitoring' in the IR response.

28 What does this mean?

29 It appears that Manitoba Hydro and its partners assume that the same 'parameters will
 30 be measured for each VEC' post project.

31 Please inform participants and the CEC whether monitoring will continue throughout
 32 the construction phase, with analysis of the results and an indication of how data sets
 33 and results of technical work will be updated for the operation phase of Keeyask.

34 In particular, given the data and standards used for VECs, and used in the various
 35 technical reports are often as much as 10 – 20 years out of date Manitoba Hydro should
 36 advise all parties how they will bring the basis for operation of Keeyask with respect to
 37 VECs, environmental effects, and criteria and indicators use up to date for the operation
 38 phase.

39 **RESPONSE:**

40 As noted with respect to the terrestrial environment in CEC Rd 2 PFN -0079, aquatic
 41 information has not been static between the filing of the EIS and the operation of the
 42 station. The Aquatic Effects Monitoring Plan (AEMP), which is available on the
 43 Partnership's website, indicates that additional data will be collected to prior to
 44 construction. The following is stated in the AEMP with respect to monitoring schedule
 45 (emphasis added):

46 *"Baseline data were collected as part of the Keeyask environmental studies. Work for*
 47 *most study components was conducted between 1999 and 2006. **Additional information***
 48 *was collected between 2006 and 2012 where analysis indicated data gaps, in*
 49 *particular in relation to lake sturgeon. In 2013, sampling will be repeated for several*
 50 *study components ... to update databases prior to construction.*

51 *The monitoring schedule (Table 2) is as follows:*

52 • *Construction – For the purposes of this document, the construction phase is defined as*
 53 *the beginning of instream construction activities until the reservoir water level is raised*
 54 *to the full supply level (FSL), a period of five to six years. Most monitoring during*
 55 *construction is closely linked to specific activities, but **some broader-based monitoring is***
 56 *planned to provide continuity among databases established prior to construction and*
 57 *components that will be monitored during the operation phase.*

58 • *Operation – For the purpose of this document, the operation phase will begin when the*
 59 *reservoir is impounded to the FSL. Intensive monitoring will be conducted annually*
 60 *during the first three years post-impoundment, when many of the operation-related*
 61 *effects will first occur. The frequency of subsequent monitoring may be adjusted*
 62 *depending on initial results....*

63 *An evaluation of the effects of Project operation and effectiveness of mitigation*
 64 *measures will be conducted ten years after the Keeyask reservoir is first impounded to*
 65 *the FSL, and results will be summarized in a synthesis report. The synthesis report will*
 66 *also provide recommendations for continued monitoring after ten years."*

1 **REFERENCE: Volume: Response to EIS Guidelines; Section:**
2 **6.2.3.4.8 Mercury in Wildlife; Page No.: N/A**

3 **CEC Rd 2 PFN-0069a**

4 **ORIGINAL PREAMBLE AND QUESTION (PFN-0029):**

- 5 1. What are the results from the 'historic records for mercury concentration in
6 indicator species' near the RSA?
7 2. Have any studies regarding mercury concentration in mink, or otter in the RSA, or
8 LSA prior to filing the Keeyask EIS?
9 3. Have any studies regarding mercury concentration in these and other mammals
10 been done since those cited in this section of the EIS?

11 **FOLLOW-UP QUESTION:**

12 Manitoba Hydro has indicated that monitoring and testing for mercury in species is
13 ongoing. How will the ongoing monitoring and testing be reported, and used in
14 decisions for the operation of the Keeyask project?

15 **RESPONSE:**

16 CEC Rd 1 PFN-0029 focused on mercury in mammals. The draft Terrestrial Effects
17 Monitoring Plan is available at www.Keeyask.com. The Preface to that report provides
18 an overview of the Keeyask Environmental Protection Program, including the role of
19 monitoring plans. It notes:

20 "The Environmental Monitoring Plans are designed to measure the actual
21 effects of the Project, test predictions or identify unanticipated effects. During
22 the course of the environmental assessment, numerous requirements for
23 monitoring were identified. There will be both technical science monitoring and
24 Aboriginal Traditional Knowledge (ATK) monitoring undertaken. The technical
25 science monitoring will be conducted by Manitoba Hydro and specialized
26 consultants contracted by Manitoba Hydro, who will in turn hire members of
27 the KCNs to work with them to fulfil the monitoring activities. Manitoba Hydro
28 will also have contracts with each of the KCNs to undertake ATK monitoring of
29 the project.

30 The activities that occur and the results generated from the Environmental
31 Protection Program will be discussed at MAC meetings. The MAC is an advisory
32 committee to the Partnership Board of Directors and will review outcomes of
33 the programs and, if appropriate provide advice and recommendations to the
34 Partnership on additional monitoring or alternative mitigation measures that
35 may be required. The MAC will provide a forum for collaboration among all

36 partners. On behalf of the Partnership, the MAC will also ensure that the
37 outcomes of the Environmental Protection Program are communicated more
38 broadly on an annual basis to Members of the KCNs, regulators and the general
39 public." (p. iii)

40 Also see CEC Rd 2 CAC-0167 regarding the reporting of monitoring results.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section:**
 2 **6.2.3.4.8 Mercury in Wildlife; Page No.: N/A**

3 **CEC Rd 2 PFN-0069b**

4 **ORIGINAL PREAMBLE AND QUESTION (PFN-0029):**

- 5 1. What are the results from the 'historic records for mercury concentration in
- 6 indicator species' near the RSA?
- 7 2. Have any studies regarding mercury concentration in mink, or otter in the RSA, or
- 8 LSA prior to filing the Keeyask EIS?
- 9 3. Have any studies regarding mercury concentration in these and other mammals
- 10 been done since those cited in this section of the EIS?

11 **FOLLOW-UP QUESTION:**

12 Did Manitoba Hydro use the Manitoba Government standards for consumption of fish
 13 (assumed mercury levels) in Stephens Lake, and Split Lake as a basis for their self-
 14 assessment in the EIS?

15 **RESPONSE:**

16 For the record, the follow-up question is unrelated to CEC Rd 1 PFN-0029, which deals
 17 with mercury in mammals.

18 Overall, a very similar approach was used. The Human Health Risk Assessment (HHRA)
 19 used toxicity reference values (TRVs) for evaluation of exposure to methyl mercury that
 20 are used in guidance provided by Manitoba Water Stewardship (2007) "Mercury in Fish
 21 & Guidelines for the Consumption of Recreationally Angled Fish in Manitoba" (available
 22 at:
 23 [http://www.gov.mb.ca/waterstewardship/fisheries/education/mercury_final_nov_2007](http://www.gov.mb.ca/waterstewardship/fisheries/education/mercury_final_nov_2007.pdf)
 24 [.pdf](http://www.gov.mb.ca/waterstewardship/fisheries/education/mercury_final_nov_2007.pdf)); that document developed fish consumption guidelines for sensitive members of
 25 the population (*i.e.*, children and women of childbearing age) using the Health Canada
 26 tolerable daily intake of 0.2 µg/kg bw/day and for the general population using the
 27 Health Canada tolerable daily intake of 0.47 µg/kg bw/day. In providing guidance on the
 28 health of Canadians, Health Canada (2007) "Human Health Risk Assessment of Mercury
 29 in Fish and Health Benefits of Fish Consumption" (available at: [http://www.hc-](http://www.hc-sc.gc.ca/fn-an/pubs/mercur/merc_fish_poisson-eng.php)
 30 [sc.gc.ca/fn-an/pubs/mercur/merc_fish_poisson-eng.php](http://www.hc-sc.gc.ca/fn-an/pubs/mercur/merc_fish_poisson-eng.php)) uses this tolerable daily intake
 31 of 0.2 µg/kg bw/day for sensitive receptors and 0.47 µg/kg bw/day for the general
 32 population. Health Canada has confirmed that these toxicity reference values remain
 33 applicable at the present time.

34 With the above noted, the HHRA differed from the methods used in the Manitoba
 35 guidelines for consumption of recreationally angled fish with respect to the assumed

36 fish consumption rates, serving sizes and mercury concentrations in fish. The assumed
37 consumption rates of fish and serving sizes used in the HHRA were provided through
38 direct consultation with the KCNs representatives. Concentrations of mercury in fish
39 were measured or predicted by North/South Consultants for the lakes of concern and, in
40 some cases, for various sizes of fish. These modifications were considered to be more
41 reflective of the KCNs habits and fish from the lakes of concern and so replaced those
42 aspects of the methods used in the Manitoba guidelines for consumption of
43 recreationally angled fish.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section:**
2 **6.2.3.2.6 Surface Water and Ice Regime; Page No.: N/A**

3 **CEC Rd 2 PFN-0070**

4 **ORIGINAL PREAMBLE AND QUESTION (PFN-0030):**

5 The EIS indicates on page 6 – 29 that “ river flows to the LSA originate from the Upper
6 Nelson River, the Burntwood River and the local inflow.

7 1. Will Manitoba Hydro made available statistics or data for these rivers flows, over
8 time?

9 This request is in an IR based on the preference of the Keeyask project managers and is
10 to be used in the Land and Water Changes analysis, funded by CEC.

11 **FOLLOW-UP QUESTION:**

12 Manitoba Hydro has provided the address for a public site which provides statistics for
13 outflow data. Please confirm that this web site provides outflow data for each structure
14 Manitoba Hydro operates. Our offices have identified the water elevation data for each
15 reservoir only to date.

16 **RESPONSE:**

17 The web site does not provide outflow data for each structure that Manitoba Hydro
18 operates. The response to CEC Rd 1 PFN-0030 includes a table of all water level and flow
19 data on the Burntwood River and Nelson River that is available at the Environment
20 Canada website. The website provides outflow data for the Kelsey, Kettle and Long
21 Spruce Generating Stations only.

1 **REFERENCE: Volume: Project Description Supporting Volume;**
2 **Section: 4.1 Overall System Effects; Page No.: N/A**

3 **CEC Rd 2 PFN-0071**

4 **ORIGINAL PREAMBLE AND QUESTION (PFN-0032):**

5 The EIS materials state that the Churchill River Diversion (CRD) and the Lake Winnipeg
6 Regulation (LWR) determine the seasonal flow patterns in the Nelson and Burntwood
7 rivers, and consequently the flows available for all the generation stations along those
8 rivers, including Keeyask.

9 Answer to the following questions:

- 10 1. Will there be no change in water levels to the Keeyask reservoir arising from the
11 LWR and/or CRD.
- 12 2. Under special operating conditions or emergencies, can the CRD or LWR be used to
13 augment river flows to support power generation for facilities along the Nelson
14 River?
- 15 3. Confirm that there will be no increase to LWR water levels in order to support
16 seasonal flows for Wuskwatim, Keeyask and Conawapa.

17 **FOLLOW-UP QUESTION:**

18 There is no reference or content in the answer as to which Lake Winnipeg Regulation
19 permit is the basis for in the answer. Please confirm that the answer to IR 0032 is in
20 relation to the current Lake Winnipeg Regulation permit, and water range allowed,
21 citing the year and number of the permit.

22 **RESPONSE:**

23 References to the LWR licence in the response to CEC Rd 1 PFN-0032 were to the
24 aggregate of the following licenses (as issued in accordance with the provisions of the
25 Water Power Act):

- 26 1. Interim License for the Regulation of Water Levels for Water Power Purposes - Lakes
27 Winnipeg, Playgreen, and Kiskittogisu (issued on November 18th, 1970).
- 28 2. Supplementary Interim License for the Regulation of Water Levels for Water Power
29 Purposes – Lakes Winnipeg, Playgreen, and Kiskittogisu (issued on August 8th, 1972).

30 On December 22nd, 2010, Manitoba Hydro requested a Water Power Act Final Licence
31 from the Province of Manitoba. As indicated in part 3 of the response to CEC Rd 1 PFN-
32 0032, no changes to the operating license/conditions of LWR are anticipated. In other

- 33 words, MH expects the Final Licence to have the same operating limits as established in
34 the Interim/Supplementary Interim Licenses.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 7.5.2**
2 **Terrestrial Environment; Page No.: N/A**

3 **CEC Rd 2 PFN-0072a**

4 **ORIGINAL PREAMBLE AND QUESTION (PFN-0021):**

5 The EIS says "Terrestrial environment ...substantially altered...continued to experience
6 those effects today." In contrast, the Summary of Cumulative Effects of Project with
7 Past and Current Activities (7.5.2.2), the proponent suggests that all of these previous
8 (and significant) effects are no longer significant.

- 9 1. If all of these impacts of past projects are so significant, with long-term effects, how
10 could the proponent be so sure that impacts of the Keeyask project will not be
11 significant? How do you explain this?
12 2. What is the basis for this assumption?
13 3. Did the CN Partners agree that environmental effects from Keeyask are
14 insignificant?
15 4. Was a list of effects of past and current projects and activities that have had
16 significant, long-term effect on the terrestrial environment used for cumulative
17 effects assessment?

18 **FOLLOW-UP QUESTION:**

19 Two of these benchmarks ("relative degree of change from relatively natural
20 conditions") are both weak (relative change from a relative condition) and "conditions in
21 areas relatively unaffected by human development" are both weak. It is unlikely that the
22 proponent is really comparing to a natural condition, since the entire hydrological
23 system is no longer in a natural condition, and hasn't been for some time. Neither
24 would lead to an assessment of change solely due to human intervention.

25 What does the proponent consider to be a natural condition?

26 **RESPONSE:**

27 Based on the preamble, the follow-up question references statements provided in a
28 general overview section of the Terrestrial Environment Supporting Volume (Section
29 1.4.3) and not in Section 5.5 of the Response to EIS Guidelines. Consequently, the
30 criteria are broadly worded to capture the full range of VEC and supporting topic
31 applications and a range of issues related to "natural conditions". In this overview
32 section, a "natural condition" is broadly considered to be a condition not affected by
33 human activity - but, as reviewed in the response to CEC Rd 1 Mb Wildlands-0075, it is
34 understood that there is need to refer to "areas relatively unaffected by human activity

35 because no place on earth is free from global human effects (e.g., atmospheric
36 deposition of chemical elements)."

37 Details regarding whether any of these criteria was actually used for a specific VEC or
38 supporting topic, and if so how it was applied, are provided in the EIS in the methods
39 section for each VEC and supporting topic.

40 As a clarification to the second sentence of the question preamble, the Terrestrial
41 Environment Supporting Volume acknowledges that the Nelson River hydrological
42 system is highly disrupted relative to its pre-development condition (see Sections 1.5,
43 2.8.2.4). In this context, the EIS assesses the significance of incremental effects of the
44 Project and considers the extent to which such effects differ from the range of changes
45 that occur "naturally" today in the current disrupted environment without the Project.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 7.5.2**
 2 **Terrestrial Environment; Page No.: N/A**

3 **CEC Rd 2 PFN-0072b**

4 **ORIGINAL PREAMBLE AND QUESTION (PFN-0021):**

5 The EIS says "Terrestrial environment ...substantially altered...continued to experience
 6 those effects today." In contrast, the Summary of Cumulative Effects of Project with
 7 Past and Current Activities (7.5.2.2), the proponent suggests that all of these previous
 8 (and significant) effects are no longer significant.

- 9 1. If all of these impacts of past projects are so significant, with long-term effects, how
 10 could the proponent be so sure that impacts of the Keeyask project will not be
 11 significant? How do you explain this?
 12 2. What is the basis for this assumption?
 13 3. Did the CN Partners agree that environmental effects from Keeyask are
 14 insignificant?
 15 4. Was a list of effects of past and current projects and activities that have had
 16 significant, long-term effect on the terrestrial environment used for cumulative
 17 effects assessment?

18 **FOLLOW-UP QUESTION:**

19 The way this matrix is designed it makes it very unlikely that anything will advance to a
 20 Step 2 assessment. Where a Step 2 analysis was conducted, effects became acceptable
 21 because the proponent is able to choose from the following list of rationale at their
 22 convenience, which negate any adverse impacts: there won't be an adverse effect on
 23 aquatic biota (united /unreferenced assumption in the case of TSS); adverse effects
 24 offset by artificial lake stocking in the case of lake; cumulative area losses for all priority
 25 habitat types are predicted to remain below 10%; "significant" wetlands aren't affected
 26 (I all wetlands are regional or locally significant); no endangered or threatened species
 27 are known to occur in affected areas, or if there is a threatened species such as the
 28 Olive-sided flycatcher- it is found not significant because there is suitable habitat
 29 throughout the region (the question of why this species is threatened if changes to it's
 30 habitat are not significant). In short, any impact significant enough for a Step 2
 31 assessment is then found to have non-significant effects based on the proponent's
 32 choosing.

33 Cite the source(s) of the methodology described in section 5-5, and the source of Figure
 34 5-1, pg 5-12.

35 **RESPONSE:**

36 The preamble to this question makes various assertions that are not related to issues
37 raised in the original question or response, and without sufficient detail or reference to
38 clarify what specifically is being asserted or questioned.

39 As noted in response to CEC Rd 1 CAC-0012 (which was referenced in response to CEC-
40 Rd 1 PFN-0021), Section 5.5 of the Response to EIS Guidelines addresses the approach
41 and criteria used in determining regulatory significance of residual effects, consistent
42 with requirements in the EIS Guidelines. The factors considered as part of the
43 significance assessment are comparable to those in many other EIS submissions and the
44 process for applying these factors has been designed to diligently and systematically
45 determine the significance of residual adverse effects.

46 Section 5.5 addresses how the required criteria are applied, where relevant, to the
47 assessment of Project residual adverse effects on each VEC. Step 1 outlines how residual
48 adverse effects of the Project on each VEC are initially assessed with regard to
49 magnitude, geographic extent and duration. The combination of these three factors
50 provides a strong indication of the seriousness of potential residual adverse effects, and
51 whether or not there is any potential for a residual adverse effect to be significant. If the
52 analysis at this stage showed that there was little potential for a significant residual
53 adverse effect, then no further analysis was undertaken.

54 If the analysis in Step 1 showed that there was any potential for a residual adverse
55 effect to be significant then further consideration was undertaken in Step 2 based on all
56 of the remaining criteria (frequency, reversibility and ecological and social context). In
57 some cases, it was fairly clear that based on magnitude, extent and duration it was
58 unlikely that the effect would be significant, but Step 2 was still applied, and the other
59 factors considered, to provide greater certainty that the residual adverse effect was not
60 significant. For example, all residual adverse effects on a species listed as threatened or
61 of special concern⁶ (or being considered for such listing when the EIS was filed based on
62 a COSEWIC recommendation) were assessed in both Step 1 and Step 2. Given the
63 already vulnerable status of VECs that are species listed as threatened or of special
64 concern, Step 2 was automatically applied and the additional criteria were considered
65 because in these cases even small changes have the potential to lead to significant
66 adverse effects.

⁶ Note that no VECs for the Keeyask Generation Project are presently listed as endangered under the *Species at Risk Act*. Lake Sturgeon is being considered for listing in this region and this species has received prominent treatment in the assessment.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 7.3.2**
 2 **Summary of Project Physical Effects; Page No.: N/A**

3 **CEC Rd 2 PFN-0073**

4 **ORIGINAL PREAMBLE AND QUESTION (PFN-0022):**

5 Sections in chapter 7 outline changes from a current condition (e.g. % habitat change)
 6 due to the project, rather than from a historical baseline or pre-development condition
 7 across all developments in the hydrological region. Whereas Hegman et al (1999) refers
 8 to the need to assess whether an individual project is incrementally responsible for
 9 adversely affecting a VEC beyond an acceptable point.

- 10 1. How is the long term flooding expected taken into account?
 11 2. Did Manitoba Hydro take into account any historic baseline for % habitat change
 12 data?
 13 3. Did Manitoba Hydro include habitat change measurements from other generation
 14 station projects to establish methods to predict habitat change % for Keeyask?

15 **FOLLOW-UP QUESTION:**

- 16 1. The proponent is measuring change from current, not a historical baseline
 17 2. "The proponent refers to CAC-0012, which states: Ultimately, the focus of the
 18 assessment was on the future rather than on the past, i.e., on examining the
 19 vulnerability of each VEC today and in the future without the Project (due to
 20 whatever factors might affect this vulnerability), in order to help in identifying the
 21 extent to which incremental effects on a VEC from additional changes caused by the
 22 Project could potentially result in a cumulative significant adverse effect on the
 23 VEC."

24 "For historical conditions, [the temporal scope was determined separately for each key
 25 topic] as far into the past as needed to describe historical conditions and trends, subject
 26 to the availability of relevant historical information" (emphasis added)."

27 The proponent then refers to key historical habitat data incorporated into the study, but
 28 this was only performed within the Regional Study Area and only considers historical
 29 changes such as those from settlements, roads and transmissions lines... not from
 30 flooding. They conclude: "In summary, in accordance with good practice for a project-
 31 focused EIS carried out to meet regulatory environmental assessment requirements,
 32 available and relevant information on pre-disturbance conditions was considered in the
 33 significance assessments of the Project's residual effects for all VECs identified for the
 34 Project's environmental assessment."

35 Please state the total area of habitat loss to date due to settlements, roads and
 36 transmission lines in the combined RSAs for the generation stations on the Nelson River,
 37 and in and assumed in the Keeyask Regional Study Area. Also, please state the amount
 38 of land area that has been flooded as a result of hydroelectric development in Manitoba
 39 to date, as this was omitted from the historical analysis described in CAC-0012 and CEC-
 40 0020.

41 **RESPONSE:**

42 Before responding to the follow-up question, the following comments are provided on
 43 the follow-up preamble:

- 44 · Statement 1) of the preamble to the follow-up question says the EIS measures
 45 change from only the current baseline, implying that historical conditions are
 46 ignored. This is an incorrect interpretation of the assessment of the Project provided
 47 in the Response to EIS Guidelines. While change due to the Project must, of
 48 necessity, be measured from current conditions (reflecting the world without the
 49 Project), the effects of such changes due to the Project on each VEC considered the
 50 extent to which a VEC was already impacted by other historical projects and
 51 activities. Please see response to CEC Rd 2 PFN-0050a.
- 52 · Statement 2) of the preamble to the follow-up question incorrectly suggests that
 53 historical changes from hydroelectric flooding were not considered. The
 54 approximately 611 km² of total historical terrestrial habitat loss and alteration from
 55 past human development reported in CEC Rd 1 CAC-0012 captures impacts from the
 56 range of past and current projects, including nearly 400 km² of flooding from past
 57 hydroelectric developments. CEC Rd 1 CAC-0012 indicates that settlements, roads
 58 and transmission lines were provided as examples of the types of human
 59 infrastructure included in the 611 km² of past development.

60 *Please state the total area of habitat loss to date due to settlements, roads and*
 61 *transmission lines in the combined RSAs for the generation stations on the Nelson River,*
 62 *and in and assumed in the Keeyask Regional Study Area.*

63 Table 2-4 of the Terrestrial Environment Supporting Volume indicates how much each
 64 development type contributes to the approximately 611 km² of historical terrestrial
 65 habitat loss and alteration. Table 1 of the response to CEC Rd 1 CEC-0021 summarizes
 66 how this total area relates to the pre-development amount of terrestrial habitat, as well
 67 as how total terrestrial habitat is expected to change with the Project alone and with
 68 other potential future projects.

69 For further reference, Table 3 of the response to CEC Rd 1 CEC-0035 itemizes the land
 70 areas encompassed by projects developed from 1955 to 1994 within the Split Lake Cree
 71 Study Area and the Split Lake Resource Management Area, while the responses to

72 CFLGC-0020a to g provide maps for areas flooded by Nelson River hydroelectric
73 development in the Regional Study Area.

74 *Also, please state the amount of land area that has been flooded as a result of*
75 *hydroelectric development in Manitoba to date, as this was omitted from the historical*
76 *analysis described in CAC-0012 and CEC-0020.*

77 The total land area that has been flooded as a result of hydroelectric development in
78 Manitoba to date is outside of the scope of the Keeyask Project assessment. For
79 information on land area flooded in the Split Lake and Fox Lake RMAs, please see the
80 response to CEC Rd 1 CEC-0035.

1 **REFERENCE: Volume: Physical Environment Supporting Volume;**
 2 **Section: 2.1 Climate Change reference to IPCC 2001; 2.2.1.2**
 3 **Climate Change future scenarios date to 2001; Page No.: N/A**

4 **CEC Rd 2 PFN-0074**

5 **ORIGINAL PREAMBLE AND QUESTION (PFN-0023):**

6 The EIS makes an assumption of no change in variability or frequency of weather events
 7 compared to present day (pg. 100). "It is contradictory to use climate modeling that
 8 assumes no change in variability, yet changes in variability are predicted. This
 9 contradicts the IPCC that states, "type, frequency and intensity of extreme storm events
 10 are expected to change as earth's climates changes" (pg 111).

11 1. What does Manitoba Hydro see as the variability of weather and climate in the
 12 region, based on IPCC statement above?

13 **FOLLOW-UP QUESTION:**

14 Manitoba Hydro is pointing us to the fact that they use the best available climate
 15 modeling for their assessment, yet implicitly acknowledge that it is insufficient (see IR-
 16 0011). In these cases, the best that they used is outdated. By using the Delta model, the
 17 proponent admits that it has not incorporated the potential for changes in variability or
 18 frequency of weather events compared to the present day. At the same time, it
 19 acknowledges on page 2-19 of the Physical Environment Supporting Volume that the
 20 type, frequency and intensity of extreme events are expected to change as Earth's
 21 climate changes. The proponent also acknowledges that the conclusions made in Table
 22 3 of the Technical Memorandum are global or continental scale, not specific to smaller
 23 regions such as the Keeyask study area. So, in other words, Manitoba Hydro doesn't have
 24 good local data to support the assessment of local impacts. How will Manitoba Hydro
 25 update and improve its local and climate change data so that the Keeyask climate
 26 change effects assessment is based on models and standards in the 2013 IPCC
 27 Assessment?

28 **RESPONSE:**

29 In CEC Rd PFN-0011 (or any IR response), the Partnership did not acknowledge that the
 30 climate modeling is insufficient or outdated.

31 There is no 2013 IPCC Assessment. The new Intergovernmental Panel on Climate
 32 Change's Fifth Assessment Report (AR5) is scheduled to be released in 2014. The
 33 Keeyask environmental assessment is therefore based on the most current
 34 internationally accepted climate change information and data (see CEC Rd 2 PFN-0048
 35 for additional discussion).As stated in the response to CEC Rd 1 PFN-0023, the Delta

36 method is recognized as standard practice among national climate change researchers
37 studying climate change impacts and is consistent with the current guidance available
38 from the Intergovernmental Panel on Climate Change's Task Group on Data and
39 Scenario Support for Impact and Climate Assessment (TGICA). (See response to CEC Rd 2
40 PFN-0051 for more information). Internationally recognized climate change experts
41 from the Ouranos Consortium provided KHLP with the climate scenario methodology (as
42 recommended by TGICA), GCM and RCM data, and final peer review of the climate
43 scenarios developed.

44 Analysis of historic and future projections of average temperature and precipitation
45 were conducted on a local scale for the Keeyask project region (Technical Memoranda
46 GN-9.5.1 and GN-9.5.2). Projections of extreme events were provided at a global and
47 continental scale since at smaller scales there is larger internal model variability and
48 increased model uncertainty leading to reduced confidence in these projections. As a
49 result, KHLP has provided a summary of the IPCC's assessment on regional impacts to
50 variability and extreme events generally as: "...the type, frequency and intensity of
51 extreme events are expected to change as Earth's climate changes, and these changes
52 could occur even with relatively small mean climatic changes...a number of modeling
53 studies have also projected a general tendency for more intense but fewer storms
54 outside the tropics, with a tendency towards more extreme wind events...". Additional
55 details can be found in Table 3 of the Technical Memorandum GN-9.5.2.

1 **REFERENCE: Volume: Aquatic Environment Supporting Volume;**
 2 **Section: 2.5 Water Quality; Page No.: Table 2-13 Residual Effects**
 3 **on Water Quality**

4 **CEC Rd 2 PFN-0075**

5 **ORIGINAL PREAMBLE AND QUESTION (PFN-0035):**

6 Residual effects on water quality for Split Lake and Stephens Lake reservoir are
 7 predicted to be negligible for the construction and operation phases of the Keeyask
 8 project.

9 Please respond to the following questions:

- 10 1. Explain how these conclusions were arrived at?
 11 2. Provide the water quality baseline data for the Split Lake and Stephens Lake.
 12 3. How are the water levels in Stephens Lake predicted to fluctuate in response to the
 13 Keeyask Project?

14 **FOLLOW-UP QUESTION:**

15 Explain why Stephens Lake is used as a proxy area. Were other reservoirs or lakes in the
 16 Hydro system considered as a possible proxy?

17 **RESPONSE:**

18 The water quality assessment was based on the use of information from other
 19 reservoirs, including Stephens Lake, as well as the models described in detail in the
 20 Aquatic Environment Supporting Volume Section 2.5. Particular emphasis was placed on
 21 documented effects from Stephens Lake due to its proximity to the proposed Keeyask
 22 site and similarity of land that would be flooded. However, information was used from
 23 other reservoirs in Manitoba, as well as elsewhere in Canada.

24 For example, the assessment of Project effects on dissolved oxygen AE SV p. 2-54 states:

25 *“Dissolved oxygen is commonly affected by reservoir creation due to the*
 26 *introduction and subsequent decomposition of flooded organic materials and is*
 27 *generally most affected in nearshore, flooded habitats (e.g., Paterson et al.*
 28 *1997). Lower DO concentrations have been observed in northern Manitoba*
 29 *reservoirs (e.g., Notigi Lake: Hecky et al. 1987a; Stephens Lake: Cleugh 1974,*
 30 *Crowe 1973) and Quebec reservoirs (e.g., Hayeur 2001) following flooding. In*
 31 *addition, DO may be affected by alterations in the thermal regime (e.g., should*
 32 *stratification be created), the ice regime (i.e., changes in the timing of freeze-up*
 33 *and break-up and/or the extent and duration of open water areas in winter that*

34 *in turn affect recreation), the water regime (e.g., changes in water residence*
 35 *times, water depths, mixing, turbulence), and erosion of organic shoreline*
 36 *materials (e.g., introduction of organic materials from shoreline erosion may*
 37 *increase the oxygen demand in water).*

38 *Information collected from reservoirs in Manitoba indicates that the magnitude*
 39 *and duration of effects to DO are variable. For example, no effects to DO were*
 40 *reported for SIL post- CRD, which was postulated to be a result of the large*
 41 *volume of the lake, rapid mixing and large fetches (Hecky et al. 1987a). This*
 42 *occurred despite observed decreases in DO in limnocorral experiments in which*
 43 *organic materials, including moss/peat, were added to SIL surface waters (Hecky*
 44 *et al. 1987a). Conversely, decreases in DO were observed in both the east and*
 45 *west basins of Notigi Lake during and following reservoir filling (Bodaly et al.*
 46 *1984a; Hecky et al. 1987a). Anoxic conditions were reached at depth during the*
 47 *filling period and reduced DO conditions persisted for a number of years*
 48 *following flooding and diversion. The observed differences regarding effects of*
 49 *impoundment on DO between SIL and Notigi Lake likely reflects differences in*
 50 *hydrology, areas of flooding, lake morphometries, and limnology (e.g., depths*
 51 *and stratification)."*

52 With respect to the duration of effects to DO, the assessment considered a variety of
 53 experimental and reservoir systems (AE SV p. 2-60):

54 *"The ELARP studies have indicated that the largest fluxes of greenhouse gases*
 55 *(GHGs) from decomposition of flooded peat occur in the first 5–10 years*
 56 *following inundation, representing decomposition of peatland vegetation, with*
 57 *continued decomposition of subsurface peat for approximately 2000 years*
 58 *beyond (Kelly et al. 1997; Dyck and Shay 1999). These studies suggest that*
 59 *effects related to flooding (e.g., DO depletion) would begin to decline after*
 60 *approximately 5–10 years over flooded areas. However, localized depletion may*
 61 *occur for longer periods in the vicinity of floating peat islands (Saquet 2003).*

62 *Similar temporal trends have been observed in other hydroelectric reservoirs.*
 63 *Key water quality variables, including DO, had "returned to pre-construction*
 64 *values" in Hydro Quebec's Opinaca and Robert-Bourassa reservoirs after*
 65 *approximately 9 or 10 years post-flood and in the Caniapiscau Reservoir return*
 66 *to "natural conditions" was nearly complete after 14 years (Hayeur 2001).*
 67 *Hayeur (2001) suggested that the more lengthy recovery period for the latter*
 68 *reservoir was related to the prolonged period of impoundment (i.e., three years*
 69 *vs. six months for the other reservoirs). Similarly, water quality conditions of the*
 70 *reservoirs of the La Grande Complex returned to natural levels within 10–15*
 71 *years post-flood.*

72 *Information collected from Stephens Lake indicates that low DO conditions*
 73 *continue to occur in areas that thermally stratify in winter (i.e., depletion is*
 74 *observed at depth) and in isolated, nearshore areas with organic substrates in*
 75 *winter as well as under atypically low wind events in summer. The offshore area*
 76 *of the north arm of Stephens Lake is currently relatively well-oxygenated in the*
 77 *open water season, indicating that effects to DO observed in this area following*
 78 *reservoir creation in the initial years following impoundment (i.e., 1972 and*
 79 *1973) have since been eliminated.”*

80 The assessment of mercury in water provides another example of the use of information
 81 from other reservoirs and results from experimental studies simulating reservoirs (AE SV
 82 p. 2-77 to 2-78):

83 *“With respect to water quality, the substantive effect of flooding on mercury in*
 84 *water is a change in the form of mercury (i.e., increases in the fraction of*
 85 *methylmercury), rather than changes in total mercury concentrations. Total*
 86 *mercury concentrations are not greatly increased in surface waters following*
 87 *reservoir creation (e.g., Kelly et al. 1997; EC and DFO 1992; Hall et al. 2005) and*
 88 *large increases are not anticipated in the Keeyask reservoir on the basis of the*
 89 *available literature. Ramsey (1991b) and EC and DFO (1992) reported that*
 90 *concentrations of mercury in water were not higher in reservoirs along the CRD*
 91 *route following diversion, relative to an upstream lake (Granville Lake). In*
 92 *addition, the mean concentration of mercury measured in surface peat from the*
 93 *study area is similar to concentrations of mercury measured in 1981–82 in*
 94 *unflooded peat adjacent to lakes along the CRD and in flooded peat in lakes*
 95 *along the CRD (Bodaly et al. 1987).*

96 *Conversely, flooding generally results in a greater relative and absolute*
 97 *concentration of methylmercury in aquatic ecosystems, although the*
 98 *concentrations generally remain relatively low in the water column (e.g., Kelly et*
 99 *al., 1997). For example, concentrations of methylmercury were higher in CRD*
 100 *reservoirs in 1981–1982 than in Granville Lake (EC and DFO 1992). Ramsey*
 101 *(1991b) further reported that concentrations of methylmercury were notably*
 102 *higher over flooded areas.*

103 *Methylation of mercury in flooded soils depends on various factors, but is*
 104 *typically highest under anoxic, acidic conditions. Methylmercury production is*
 105 *also related to the quantity and nature of flooded organic matter, generally*
 106 *increasing with increasing OC. However, the quantity of labile versus recalcitrant*
 107 *organic matter also affects methylation rates. For example, Hall et al. (2005)*
 108 *reported similar rates of methylmercury production in flooded upland forests*
 109 *(FLUDEX studies) with lower quantities of carbon than the peatlands flooded in*

110 *the ELARP studies. It was postulated that this was related to the more*
111 *recalcitrant nature of peat organic matter. Therefore, while the overall quantity*
112 *of OC may be higher in peatlands, degradation and methylmercury production*
113 *rates may be reduced relative to other soils. That is, the total amount of readily*
114 *degradable OC appears to be the most pertinent factor determining rates of*
115 *overall degradation and methylmercury production in freshwater systems.*
116 *Methylmercury production rates from experimental wetland and upland*
117 *reservoirs at the ELA, ON began to decrease over the first three years of flooding*
118 *(Hall et al. 2005)."*

1 **REFERENCE: Volume: Aquatic Environment Supporting Volume;**
2 **Section: 2.5.1.3.3 Treated Sewage Effluent; Page No.: N/A**

3 **CEC Rd 2 PFN-0076a**

4 **ORIGINAL PREAMBLE AND QUESTION (PFN-0036):**

5 The EIS materials predict that since sewage effluent will be treated (limit Total
6 phosphorous levels to 1mg/L) and due to high river discharge, there will be limited
7 effects of nutrient loading in the lower Nelson River. Phosphorous is a limiting nutrient
8 for macrophyte and phytoplankton growth. Increases in baseline P levels would
9 inadvertently alter the density of plant and algae in the Stephens Lake reservoir.

10 Please respond to the following questions:

- 11 1. What is the predicted flow rate of treated effluent being released into Stephens
12 Lake per hour, during the construction and operation phases of the project? Explain.
- 13 2. Where will the effluent from the Keeyask Project be released? Stephens Lake?
- 14 3. Will the phosphorous and nitrogen rich effluent released into Stephens Lake impact
15 growth of blue-green algae and other phytoplankton.
- 16 4. Do the predicted phosphorous levels also include contributions from other nutrient
17 rich effluent sources originating from the project; peatland flooding, waste water,
18 concrete batch plant effluent, dewatering etc?
- 19 5. Has the impact to nitrogen and phosphorous ratios been investigated? If not, why
20 not?

21 **FOLLOW-UP QUESTION:**

22 Question # 2 Please confirm that effluent that will be released into the Nelson River, as
23 per IR response, will also then travel via the Nelson River through Stephens Lake.

24 **RESPONSE:**

25 Wastewater effluent will be discharged to the main channel of the Nelson River, which
26 flows through Stephens Lake.

1 **REFERENCE: Volume: Aquatic Environment Supporting Volume;**
 2 **Section: 2.5.1.3.3 Treated Sewage Effluent; Page No.: N/A**

3 **CEC Rd 2 PFN-0076b**

4 **ORIGINAL PREAMBLE AND QUESTION (PFN-0036):**

5 The EIS materials predict that since sewage effluent will be treated (limit Total
 6 phosphorous levels to 1mg/L) and due to high river discharge, there will be limited
 7 effects of nutrient loading in the lower Nelson River. Phosphorous is a limiting nutrient
 8 for macrophyte and phytoplankton growth. Increases in baseline P levels would
 9 inadvertently alter the density of plant and algae in the Stephens Lake reservoir.

10 Please respond to the following questions:

- 11 1. What is the predicted flow rate of treated effluent being released into Stephens
 12 Lake per hour, during the construction and operation phases of the project? Explain.
- 13 2. Where will the effluent from the Keeyask Project be released? Stephens Lake?
- 14 3. Will the phosphorous and nitrogen rich effluent released into Stephens Lake impact
 15 growth of blue-green algae and other phytoplankton.
- 16 4. Do the predicted phosphorous levels also include contributions from other nutrient
 17 rich effluent sources originating from the project; peatland flooding, waste water,
 18 concrete batch plant effluent, dewatering etc?
- 19 5. Has the impact to nitrogen and phosphorous ratios been investigated? If not, why
 20 not?

21 **FOLLOW-UP QUESTION:**

22 Question #2: Provide information as to other waste from Keeyask Generation Station
 23 project that will be disposed of in Gull Lake prior to it becoming a reservoir. (Quantity,
 24 type, effects,etc.)

25 **RESPONSE:**

26 For clarification purposes, the wastewater effluent during the construction phase will be
 27 discharged to the Nelson River downstream of Gull Rapids and will not be discharged to
 28 Gull Lake.

29 No waste from the construction of the Project will be disposed of into Gull Lake prior to
 30 it becoming a reservoir.

31 Section 4.3.2.10 of the EIS indicates that some of the earth and rock material that will be
 32 excavated during the construction of the principal structures cannot be used for
 33 construction and will be placed within designated excavated material placement areas

34 (EMPA). Some of the EMPAs will be located in areas within the reservoir and, once
35 flooded, the material will be submerged. IR-CEC-Rnd1-0072 explains that the EMPAs will
36 be designed to avoid impacting water quality.

37 The cleared material resulting from clearing the reservoir will be deposited in windrows
38 or piles and left to dry. The dried material will then be burned prior to reservoir
39 impoundment. The ash and other residue resulting from the burning will remain in the
40 reservoir area prior to impoundment.

1 **REFERENCE: Volume: Aquatic Environment Supporting Volume;**
2 **Section: 1A.2.1 Structures in Water - Construction Scheduling;**
3 **Page No.: N/A**

4 **CEC Rd 2 PFN-0077a**

5 **ORIGINAL PREAMBLE AND QUESTION (PFN-0037):**

6 The construction of in-water structures will be scheduled to avoid sensitive periods for
7 fish; spawning periods.

8 Please respond to the following questions:

- 9 1. How will the integrity of fish habitat be monitored throughout Keeyask construction
10 and operation phases, and the different seasons?
11 2. How does the Environmental Protection Program for aquatic habitat make
12 provisions to protect sensitive fish habitat?
13 3. What are the standards for maintenance and monitoring of sensitive fish habitat?

14 **FOLLOW-UP QUESTION:**

15 Question # 2 Provide the missing content at line 70 and line 77 where Error ! Reference
16 source not found appears in the IR Response.

17 **RESPONSE:**

18 The specific lines are restated below with the correct references.

- 19 1. The schedule for in-water work will follow **Table 5-1**.
20 2. During construction, the use of heavy equipment in and near watercourse/bodies
21 will be restricted to limits prescribed in regulatory permits and authorizations.
22 3. Measures to protect against erosion, siltation and hydrological alteration will be
23 implemented in disturbed areas that are within 50 m of any off-system marsh
24 identified in **Appendix B – Map Alignment Sheets**.

1 **REFERENCE: Volume: Aquatic Environment Supporting Volume;**
2 **Section: 1A.2.1 Structures in Water - Construction Scheduling;**
3 **Page No.: N/A**

4 **CEC Rd 2 PFN-0077b**

5 **ORIGINAL PREAMBLE AND QUESTION (PFN-0037):**

6 The construction of in-water structures will be scheduled to avoid sensitive periods for
7 fish; spawning periods.

8 Please respond to the following questions:

- 9 1. How will the integrity of fish habitat be monitored throughout Keeyask construction
10 and operation phases, and the different seasons?
11 2. How does the Environmental Protection Program for aquatic habitat make
12 provisions to protect sensitive fish habitat?
13 3. What are the standards for maintenance and monitoring of sensitive fish habitat?

14 **FOLLOW-UP QUESTION:**

15 Question # 3 Confirm that there is currently no Aquatic Effects Monitoring Plan for
16 Keeyask Generation Project. Advise participants and the CEC whether this information
17 will be available for discussion and questions during the CEC hearings, or sooner. When
18 will this plan be available for public review as per the regulatory process for DFO and
19 MCWS?

20 **RESPONSE:**

21 A summary of the Aquatic Effects Monitoring Plan (AEMP) was provided in the Response
22 to EIS Guidelines Chapter 8. As discussed in CEC Rd 2 MB Wildlands-0104, a preliminary
23 draft version of the AEMP was provided to Fisheries and Oceans Canada (DFO),
24 Manitoba Conservation and Water Stewardship (MCWS), and the Canadian
25 Environmental Assessment Agency in the fall of 2012 to facilitate discussions regarding
26 the federal regulatory approvals requirements. While the AEMP is still under discussion
27 with these regulatory agencies and will be modified as an outcome of these discussions,
28 in the interest of transparency to the current process this 2012 draft version has been
29 posted on the Partnership's website at: [http://keeyask.com/wp/the-](http://keeyask.com/wp/the-project/environmental-assessment-process/preliminary-environmental-protection-program)
30 [project/environmental-assessment-process/preliminary-environmental-protection-](http://keeyask.com/wp/the-project/environmental-assessment-process/preliminary-environmental-protection-program)
31 [program](http://keeyask.com/wp/the-project/environmental-assessment-process/preliminary-environmental-protection-program).

32 The following points should be noted with respect to this draft:

- 33 · Proposed monitoring with respect to gathering information to inform regulatory
34 decisions regarding fish passage may be further modified based on discussions
35 among the Partnership, DFO, and MCWS (see CEC Rd2-CEC-0091); and
 - 36 · The plan will be updated to include measures identified during the IR process (e.g.,
37 definition of monitoring until “stable” mercury levels are reached).
- 38 The Partnership expects that, as with Authorizations and *Environment Act* licences for
39 other generating station projects, the final AEMP will form part of the regulatory
40 approvals for the Keeyask Generation Project and a final version will be posted to the
41 Project website.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
2 **Volume; Section: 2.8.4.3 Residual Effects Conclusions (to**
3 **Wetlands); Page No.: N/A**

4 **CEC Rd 2 PFN-0078**

5 **ORIGINAL PREAMBLE AND QUESTION (PFN-0038):**

6 EIS materials indicate the overall residual effects of the project on wetland function are
7 expected to be adverse, irreversible and continuous in frequency but low in ecological
8 context. However on a global, national and provincial level, wetland impacts are
9 considered nil, as significant amounts of wetlands on that scale are not impacted.
10 Losses to native wetland types is predicted to be less than 10% in the historical area.

11 Please answer the following questions:

- 12 1. Why did Manitoba Hydro compare the loss of wetlands in Manitoba on a global and
13 national scale? Why is that a relevant analysis?
14 2. What is the current state of wetlands in Manitoba?
15 3. Did Manitoba Hydro seek to incorporate aspects of peatland conservation outlined
16 within the Manitoba Government Tomorrow Now – Green Plan?
17 4. For what length of time were the residual effects to wetlands calculated for? 30
18 years?
19 5. What model was used to assess for loss of wetlands over time, and did this model
20 incorporate;
21 a. Future Manitoba Hydro projects?
22 b. Climate change?
23 c. Anthropogenic activity?

24 **FOLLOW-UP QUESTION:**

25 Question 4 Based on the intention to gauge and assess effects on wetlands for the 40
26 years that include the construction and first 30 years of operation, provide details on
27 how effects on wetlands during the construction period will be monitored and
28 mitigated.

29 **RESPONSE:**

30 Please see the response to CEC Rd 1 MB Wildlands-0023.

36 the sturgeon stocking in the upper Nelson River; the spawning studies on Playgreen Lake
37 1995; and movement studies on Sipiwesk Lake to Kelsey GS.

38 Please provide the location of any reports or study plans for these studies if they are
39 referenced in the Keeyask EIS (I probably missed this), or available elsewhere. This is
40 relevant to the Keeyask EIS in furthering understanding of the state of knowledge
41 regarding mitigation measures in the Nelson River, and historical change in the Nelson
42 River to contribute to cumulative effects assessment.

43 **RESPONSE:**

44 Most of the work or studies listed in the question were projects conducted in
45 collaboration with the Nelson River Sturgeon Board (NRSB); in particular, sturgeon
46 culture at the Silas Ross Memorial Sturgeon Rearing Facility, sturgeon stocking in the
47 upper Nelson River and movement studies on Sipiwesk Lake to Kelsey GS. As such, any
48 study plans or reports would have been produced by, and may be available from, the
49 NRSB. Cross Lake First Nation is a founding member of the NRSB, through the efforts of
50 the late Mr. Ernie Scott, and therefore may already have study plans and reports on file.

51 The study of spawning habitat on Playgreen Lake in 1995 was conducted for Manitoba
52 Hydro as part of continued involvement with lake sturgeon research. The objective was
53 to provide preliminary data on lake sturgeon habitat identified by the community of
54 Norway House. The report is included on the CD of technical reports provided with this
55 filing.

1 **REFERENCE: Volume: Terrestrial Environment Supporting**
 2 **Volume; Section: 2.10 Cumulative Effects with Other Projects;**
 3 **Page No.: N/A**

4 **CEC Rd 2 PFN-0079**

5 **ORIGINAL PREAMBLE AND QUESTION (PFN-0042):**

6 The cumulative impact of the Keeyask Generation project was assessed in conjunction
 7 with future Manitoba Hydro developments; Gillam Redevelopment project, Bipole III
 8 transmission line, Keeyask Transmission Project and the Conawapa Generation Project.
 9 For all assessments examining combined future project cumulative effects to intactness,
 10 ecosystem diversity and wetland function, no cumulative effect was reported. It was
 11 not discussed how the conclusions were arrived at, what baseline values or parameters
 12 were evaluated to calculate the cumulative impacts.

13 Answer the following questions;

- 14 1. How was it determined that there were no overall net cumulative effects from all
 15 projects combined on the terrestrial environment?
- 16 2. How were the terrestrial VECs evaluated during this assessment?
- 17 3. How will the terrestrial VECs be assessed during construction and operation phases
 18 of the Keeyask project?
- 19 4. The assessment needs to be repeated, using pre-Manitoba Hydro development data
 20 (1970s) as the baseline value. Qualitative and quantitative measures of change
 21 need to be established which are comparable/measurable between all project
 22 future projects. Finally, Manitoba Hydro will have to provide the results of the
 23 assessment, and include a geographic depiction of cumulative impacts over time.

24 **FOLLOW-UP QUESTION:**

25 Question # 3 Question not answered. Answer required still. Questions regarding
 26 ongoing monitoring and collection of data to make sure that data and information is still
 27 relevant at the time of operation of Keeyask should not be dismissed in answering IRs.
 28 Assessment that is theoretical and conducted 10 – 40 years before effects needs to be
 29 become living assessment, and updated throughout.

30 **RESPONSE:**

31 To elaborate on the answer provided to CEC Rd 1 PFN-0042, terrestrial information will
 32 not be static between the filing of the EIS and the operation of the station. Since the EIS
 33 submittal, additional studies have occurred for several of the terrestrial components
 34 including caribou, moose and birds to obtain more information and to maintain an
 35 understanding of current conditions.

36 As the project transitions to construction, the biological studies shift from assessment to
37 monitoring in order to follow up on predictions made in the EIS.

38 The Terrestrial Effects Monitoring Plan (TEMP), which was filed with regulators on June
39 28, 2013 and is available on the Partnership's website, indicates that there are three
40 distinct monitoring phases: Preconstruction Monitoring, Construction Monitoring and
41 Operation Monitoring. Monitoring is scheduled for all terrestrial VECs during both the
42 construction and operation phases. The information collected will build the
43 understanding of Project effects at different stages of the Project and will keep the
44 understanding of the terrestrial environment current.

1 **REFERENCE: Volume: N/A; Section: Project Description Supporting**
2 **Volume; Terrestrial Environment Supporting Volume; Page No.:**
3 **N/A**

4 **CEC Rd 2 PFN-0080**

5 **ORIGINAL PREAMBLE AND QUESTION (PFN-0044):**

6 The Keeyask Generation EIS LSA and RSA have overlap with Forest Management Units
7 86, and 76. Manitoba Hydro has included assessment information that include habitat
8 in these FMUs.

- 9 1. What data sources regarding the FMUs did Manitoba Hydro use?
10 2. Did Manitoba Hydro contribute to the Manitoba Forest Resource Inventory due to
11 its technical and scientific studies?
12 3. Was the FRI data, or forest ecosystems data used in determining the Zones, which in
13 turn are the context for analysis for VECs?
14 4. This request is in IR form, and includes a request for the data regarding the
15 questions above. This IR is based on the request of the Keeyask Generation project
16 managers.

17 **FOLLOW-UP QUESTION:**

18 Question # 4 Manitoba Hydro has made a mistake, as this IR has nothing to do with
19 MWL IR # 0051.

20 An LCA analysis is not the same as land and water change over time analysis. We
21 request that this IR be answered fully to correct the mistake.

22 **RESPONSE:**

23 The original Information Request, CEC Rd 1 PFN-0044 did not reference a land and water
24 change over time analysis and, as with this follow-up Information Request, included LCA
25 in the Subject Matter section of the CEC IR template. For this reason, the Partnership
26 assumed the question was related to the LCA.

27 The response to CEC Rd 1 PFN-0044 #4 remains appropriate as the second paragraph in
28 MWL-0051 refers to data availability. As stated in MWL-0051, "the data the Partnership
29 is prepared to make available are included in its EIS filing, in the Technical Reports
30 outlined in Appendix 6A of the Response to EIS Guidelines and on the Partnership Web
31 site at <http://www.keeyask.com>."

ⁱ See Article 5.3.6 of the JKDA.

ⁱⁱ Kara M. Reynolds "Why Are So Many WTO Disputes Abandoned?" American University (June 2007) at p.11 <http://nw08american.edu/~reynolds/Consultations.pdf>

1 **REFERENCE: Volume: N/A; Section: Keeyask Transmission Project**
 2 **EA Report Appendix E; Page No.: N/A**

3 **CEC Rd 2 PCN-0009**

4 **ORIGINAL PREAMBLE AND QUESTION (PCN-0001):**

5 Given that there will be more flow through turbines and less flow through the spillways
 6 following Kelsey re-runnery, are there any changes predicted in the effects of
 7 entrainment on various species and age classes of fish?

8 **FOLLOW-UP QUESTION:**

9 For clarification, the original question (PCN-001) did not refer to the Keeyask
 10 Transmission Line, but rather referenced the description of changes to the Kelsey
 11 Generating Station contained in the Transmission Line document that is the same
 12 information presented in the Keeyask Generation Project EIS.

13 The original question was: Given that there will be more flow through the turbines and
 14 less flow through the spillways following Kelsey re-runnery, are there any changes
 15 predicted in the effects of entrainment on various species and age classes of fish?

16 The Proponent's response states that there is no potential spatial overlap between the
 17 residual adverse effects of the Keeyask Generation Project and the Kelsey Re-runnery
 18 project on the aquatic VECs. Therefore any changes related to entrainment at Kelsey
 19 were not investigated in the cumulative effects assessment. What we are interested in
 20 is the question of how existing hydroelectric facilities up and downstream may influence
 21 the current status of fish populations in the Keeyask Study Area. Further to this is the
 22 question of whether there may be changes in future that could combine with the
 23 Keeyask project and that should be taken into consideration in the cumulative effects
 24 assessment of hydroelectric development on fish populations in the Nelson River.

25 Passage through spillways or turbines can affect the survival of fish in different ways.
 26 Effects may depend on species and/or age class. If there are changes in fish passage and
 27 survival at the Kelsey Generating station, this may in turn affect downstream
 28 populations over time into the proposed Keeyask reservoir.

29 We are still interested in understanding what is known about the potential effects on
 30 fish passage associated with Kelsey Re-runnery. Are there any data available that can
 31 inform us about the current passage of fish at the Kelsey Generating Station, and what
 32 changes if any may be predicted in future? Please clarify whether there has been any
 33 study of this question. Please clarify whether it is the general conclusion of the
 34 Proponent that the local effects of hydroelectric facilities upstream are not relevant to

35 the cumulative effects assessment for species that can move outside of the Keeyask
36 regional study area.

37 **RESPONSE:**

38 The Response to EIS Guidelines states:

39 *“The most recent additions and alterations to existing hydroelectric developments are*
40 *the construction of the Wuskwatim GS on the Burntwood River and re-runnnering at the*
41 *Kelsey GS on the Nelson River, both of which are directly upstream of Split Lake. The Cree*
42 *world view that all parts of the environment are connected indicates that these would*
43 *overlap with the effects of the Keeyask Project. The technical assessment of the spatial*
44 *extent of effects of the Keeyask Project (Section 6.4) indicates that there is no overlap*
45 *with these recent developments. ”*

46 The Information Request also asks whether the fish community in the area that will be
47 directly affected by the Project (i.e., the Keeyask area which refers to the reach of the
48 Nelson River downstream of Clark Lake to Stephens Lake, including Gull Lake) is
49 dependent on inputs of fish from Split Lake; if that was the case, then, if re-runnnering at
50 the Kelsey GS reduced the number of fish in Spit Lake, and whether in turn this reduction
51 could potentially affect the number of fish in the Keeyask area.

52 For such a pathway of effect to occur, a substantial number of fish would need to move
53 from Split Lake to Gull or Stephens lakes. Approximately 618 fish, including 42 Lake
54 Sturgeon were tagged in Split Lake during 2001 – 2008. No fish tagged in Split Lake were
55 recaptured in Gull or Stephens lakes. Over 1000 walleye were tagged during a spawning
56 migration into the Aiken River, which discharges into an arm of Split Lake to the east of
57 the Nelson River inflow. There was no recapture of fish tagged in the Aiken River in the
58 Keeyask area. The lack of recaptures of tagged fish from Split Lake and its tributaries in
59 the Keeyask area indicates that effects of re-runnnering at the Kelsey GS on fish
60 populations in Split Lake (if they occur) would not be expected to act cumulatively by
61 changing the numbers or species of fish moving from Split Lake to the area affected by
62 the Keeyask Project.

63 Given that there is no overlap with the effects of the Kelsey re-runnnering project and the
64 Keeyask Generation Project, the potential effects of Kelsey re-runnnering on fish passage
65 is outside of the scope of the Keeyask review and is not discussed further.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 6.4**
 2 **Effects and Mitigation Aquatic Environment; TAC Public Rd 2**
 3 **Aboriginal and/or Public Comments – 0003a; Page No.: N/A**

4 **CEC Rd 2 PCN-0010**

5 **ORIGINAL PREAMBLE AND QUESTION (PCN-0003):**

6 The results of the stocking programs described in the response to a previous request for
 7 information on sturgeon stocking programs suggests very preliminary, and mostly
 8 anecdotal results of efforts to stock sturgeon in other parts of the Nelson River, and in
 9 other river systems. Testing of artificial spawning shoals has had mixed results and is still
 10 in the early stages. Current initiatives are promising and should certainly be pursued in
 11 areas of the river system where stocks are severely depleted due to habitat loss.
 12 However, the environmental assessment suggests that a residual effect of the Project
 13 will be that stocking will increase the number of sturgeon in the reach of the Nelson
 14 River between the Kelsey Generating Station and the Kettle Generating Station. It
 15 concludes that: "During the operation period, no long-term adverse effects to lake
 16 sturgeon numbers in the area directly affected by the Project are expected due to
 17 mitigation measures that provide habitat for all life history stages both above and below
 18 the generating station, and an extensive stocking program."

- 19 1. Please clarify whether this conclusion refers primarily to the numbers of sturgeon
 20 that may be found in this reach of the river at any one time, regardless of their age
 21 or reproductive capacity. In other words, if an area is stocked regularly with several
 22 thousand hatchery raised fingerlings or age 1 individuals, the numbers would be
 23 high for a time whether or not these fish survived longer-term.
 24 2. Discuss further whether these conclusions as expressed in the EIS are warranted
 25 when the evidence for success of stocking initiatives is acknowledged to be very
 26 limited.
 27 3. Clarify whether this conclusion is warranted given the acknowledged uncertainties
 28 surrounding the access and eventual use of future habitats by sturgeon, including
 29 proposed artificial shoals.
 30 4. Explain whether there is sufficient evidence to conclude that the longer-term
 31 sustainability of existing reproducing populations of lake sturgeon will not be
 32 affected by this Project.

33 **FOLLOW-UP QUESTION:**

34 The Proponents's response to our initial question regarding the geographical scope of
 35 the cumulative effects assessment states that: "The region relevant to the assessment
 36 of effects of the Keeyask Project's biophysical environment is the Lower Nelson River

37 downstream of Kelsey G.S., and, accordingly, this is the regional area focused on for the
 38 Existing Environment described in Section 6.2 of the Response to EIS Guidelines.” One
 39 review of sturgeon migration patterns suggested that a barrier-free 250–300 km
 40 combined river and lake range may be the minimum distance necessary to support self-
 41 sustaining populations of lake sturgeon, and that migrations of free-ranging populations
 42 could extend to 750–1000 km. Reference Auer, N.A. 1996. Importance of habitat and
 43 migration to sturgeons with emphasis on lake sturgeon. Can. J. Fish. Aquat. Sci.
 44 53(Suppl. 1): 152–160 (1996). Given the relatively limited data on sturgeon movement
 45 within the Nelson River, please comment further on whether the ability of sturgeon to
 46 pass existing dams and impoundments on the Nelson River up and down stream should
 47 not be considered relevant to the cumulative effects assessment of the Keeyask Project.
 48 Please clarify whether it is the conclusion of the Proponent that fragmentation of the
 49 Nelson River due to dams and flow regulation up and downstream of the Keeyask
 50 reaches is not relevant to the cumulative effects assessment of aquatic habitat
 51 disturbance on the potential for the reestablishment of self-sustaining populations of
 52 lake sturgeon.

53 **RESPONSE:**

54 Studies of adult Lake Sturgeon movements in the reach of the Nelson River that will be
 55 directly affected by the Keeyask Project (i.e., downstream of Clark Lake to Stephens
 56 Lake) have been on-going since 2001, providing a good understanding of sturgeon
 57 movements in this area. A memo discussing Lake Sturgeon movements and summarizing
 58 results from the Keeyask area is referenced in CEC Rd 2 CEC - 0099. As noted in the
 59 memo, there are many examples of healthy Lake Sturgeon populations in river reaches
 60 considerably smaller than the 250-300 km distance provided in Auer (1996).

61 The historical decline in Lake Sturgeon numbers in the Nelson River has been attributed
 62 to over-harvest and hydroelectric development, at sites where development has
 63 resulted in the loss of essential habitats. First Nations members have indicated that
 64 development of generating stations on the lower Nelson River resulted in the
 65 progressive loss of Lake Sturgeon, but whether this was caused by changes in harvest,
 66 emigration of sturgeon at impoundment, habitat alterations and/or habitat
 67 fragmentation cannot be determined (AE SV Section 6.3.1). However, as noted in the AE
 68 SV Section 6.4.2.2 and the memo referenced in CEC Rd 2 CEC-0099, healthy Lake
 69 Sturgeon populations can exist in very small reaches of rivers, indicating that there is not
 70 a requirement for a large amount of barrier-free habitat *per se*.

71 The cumulative effects assessment conducted for the Keeyask Generation Project
 72 considered the overlap between adverse effects of the Project and other developments.
 73 Adverse effects to Lake Sturgeon in the lower portion of the Keeyask reservoir and
 74 Stephens Lake are predicted to occur during construction, but the creation of habitat

75 and augmentation of sturgeon numbers during operation is expected to result in a net
 76 increase in sturgeon numbers. Adverse effects to Lake Sturgeon in this area from past
 77 developments are summarized in the Response to EIS Guidelines Section 7.5.1.2 (p. 7-
 78 18) as follows:

79 *“As summarized in Section 6.3.2.2.5, commercial fishing of lake sturgeon on the Nelson
 80 River severely depleted populations both upstream and downstream of the Kelsey GS.
 81 Precise estimates of commercial harvest for the area directly affected by the Keeyask GS
 82 are not available as catches were recorded by river reach, but interviews with resource
 83 users indicate a substantial commercial harvest in Gull Lake in the late 1950s and that
 84 harvest continued in Stephens Lake following construction of the Kettle GS into the
 85 1980s.*

86 *In addition to harvest, lake sturgeon in the Nelson River have been adversely affected by
 87 hydroelectric development. Both CRD and LWR were reported to have caused a decline in
 88 lake sturgeon numbers (Split Lake Cree – Manitoba Hydro Joint Study Group 1996c).
 89 FLCN members stated that critical habitats were lost with each dam and fish could no
 90 longer move as freely within their natural habitat, as they were able to prior to dam
 91 construction (FLCN 2009 Draft). Technical studies have found that numbers of sturgeon
 92 have declined at all locations on the Nelson River where the construction of generating
 93 stations has altered habitat for specific life history requirements such as spawning.
 94 However, healthy sturgeon populations have been documented in areas affected by
 95 hydroelectric development where habitat to support all life history stages continued to
 96 be available (see examples in Table 6-16).”*

97 As noted by the reviewer, the Partnership does not expect that creation of a barrier at
 98 the Keeyask GS *per se* will result in the decline of Lake Sturgeon or prevent the recovery
 99 of Lake Sturgeon given that habitat to support all life history requirements will be
 100 available upstream and downstream of the GS. However, as discussed in the AE SV and
 101 CEC Rd 2 CEC-0097, monitoring conducted in consultation with DFO and MCWS will
 102 inform the regulator’s decisions as to whether upstream fish passage facilities will need
 103 to be installed during the operation period to sustain fish populations.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 6.4**
 2 **Effects and Mitigation Aquatic Environment; TAC Public Rd 2**
 3 **Aboriginal and/or Public Comments – 0003a; Page No.: N/A**

4 **CEC Rd 2 PCN-0011**

5 **ORIGINAL PREAMBLE AND QUESTION (PCN-0003):**

6 The results of the stocking programs described in the response to a previous request for
 7 information on sturgeon stocking programs suggests very preliminary, and mostly
 8 anecdotal results of efforts to stock sturgeon in other parts of the Nelson River, and in
 9 other river systems. Testing of artificial spawning shoals has had mixed results and is still
 10 in the early stages. Current initiatives are promising and should certainly be pursued in
 11 areas of the river system where stocks are severely depleted due to habitat loss.
 12 However, the environmental assessment suggests that a residual effect of the Project
 13 will be that stocking will increase the number of sturgeon in the reach of the Nelson
 14 River between the Kelsey Generating Station and the Kettle Generating Station. It
 15 concludes that: "During the operation period, no long-term adverse effects to lake
 16 sturgeon numbers in the area directly affected by the Project are expected due to
 17 mitigation measures that provide habitat for all life history stages both above and below
 18 the generating station, and an extensive stocking program."

- 19 1. Please clarify whether this conclusion refers primarily to the numbers of sturgeon
 20 that may be found in this reach of the river at any one time, regardless of their age
 21 or reproductive capacity. In other words, if an area is stocked regularly with several
 22 thousand hatchery raised fingerlings or age 1 individuals, the numbers would be
 23 high for a time whether or not these fish survived longer-term.
 24 2. Discuss further whether these conclusions as expressed in the EIS are warranted
 25 when the evidence for success of stocking initiatives is acknowledged to be very
 26 limited.
 27 3. Clarify whether this conclusion is warranted given the acknowledged uncertainties
 28 surrounding the access and eventual use of future habitats by sturgeon, including
 29 proposed artificial shoals.
 30 4. Explain whether there is sufficient evidence to conclude that the longer-term
 31 sustainability of existing reproducing populations of lake sturgeon will not be
 32 affected by this Project.

33 **FOLLOW-UP QUESTION:**

34 We appreciate your interpretation of the data on sturgeon stocking programs to date,
 35 however, we maintain that the results of the sturgeon stocking programs in the Nelson
 36 River to date are preliminary and that a minimum of 15 to 20 years is required to

37 develop a comprehensive assessment that is capable of providing adequate evidence of
 38 success of stocking in any particular water body. Pimicikamak members have expressed
 39 concerns about the long-term effectiveness of sturgeon stocking programs in the upper
 40 reaches of the Nelson River, and the ability of sturgeon populations throughout the
 41 Nelson River system to recover and become self-sustaining given the multiple dams and
 42 impoundments. Some description of the challenges with sturgeon stocking is provided
 43 in the Keeyask EIS. In order to better understand the challenges faced with sturgeon
 44 stocking programs, please provide an account or references to reports detailing any
 45 problematic issues faced specifically with the upper Nelson River stocking program that
 46 may be relevant to the program being proposed for the lower Nelson River.

47 **RESPONSE:**

48 Mr. Don Macdonald (Regional Manager, Northern Region, Fisheries Branch, Manitoba
 49 Conservation and Water Stewardship) has been the provincial representative on the
 50 Nelson River Sturgeon Board since its inception and has led the sturgeon stocking
 51 program conducted by the Board. Mr. Macdonald and the technical team conducting
 52 the trial spawn collection at the Burntwood River for the Keeyask Project have worked
 53 closely together for the past several years to address issues relevant to the stocking
 54 programs on both the upper and lower Nelson River. Mr. Macdonald provided the
 55 following information with respect to the rationale for the effectiveness of stocking to
 56 recover sturgeon populations and the challenges that have faced the upper Nelson River
 57 stocking program (pers. com., August 6, 2013).

58 *“There are numerous examples in the literature of successful sturgeon stocking*
 59 *programs. In addition to the Sturgeon Board’s work there has also been*
 60 *communication with sturgeon culture experts in other areas (Rainy River, Wisconsin,*
 61 *etc.). Other jurisdictions are using sturgeon culture to rehabilitate depleted*
 62 *populations (Great Lakes, White Earth, etc.). The relative success of stocking in the*
 63 *upper Nelson should not be the primary rationale for considering stocking as a*
 64 *suitable mitigation strategy for Keeyask, however it does provide evidence of*
 65 *increasing local expertise in sturgeon culture, both with spawn collection and rearing*
 66 *at the hatchery. With reference to the specific issues faced by the Board:*

- 67 1. *Lack of collection of spawn from females: With the depletion of the Landing*
 68 *River spawning run in the early 1990s, the only location on the Nelson River*
 69 *where sturgeon could be observed spawning was gone and the Board had to*
 70 *develop methods of collecting spawn from fish that were not actively spawning*
 71 *at the time they were captured. This greatly increased the complexity of spawn*
 72 *collection, and increased vulnerability to things like changes in the weather.*
 73 *When the Board first started working on the river, the sex ratio of the population*
 74 *was strongly skewed in favour of males. This was likely an artifact of the*

75 *commercial fishery which targeted larger fish. The lack of females in the*
 76 *population limited opportunities to capture spawning females. This is becoming*
 77 *less of an issue in recent years. The introduction of the use of hormones to*
 78 *induce spawning in 2011 has also been a major factor in addressing the limited*
 79 *brood stock.*

80 2. *Die-off of sturgeon in the hatchery: Lake Sturgeon culture is a developing field.*
 81 *Over almost two decades of experimenting with sturgeon culture techniques,*
 82 *there have been several years where rearing was not successful. In some cases it*
 83 *appears that the problems arose from failure to convert to the feed provided, in*
 84 *others the cause remained unknown. Recently more has become known about*
 85 *sturgeon diseases that can cause mortality in a hatchery environment.*

86 3. *Death of female sturgeon used to collect spawn: This occurred in 2012. All*
 87 *sturgeon injected with a hormone that triggered spawning were removed from*
 88 *the river for 30 days to ensure that all traces of injected hormones were gone*
 89 *before fish were available to be caught and consumed by subsistence fishers. In*
 90 *this case the stress of transporting a large fish resulted in the death of that fish.*
 91 *This issue was addressed in 2013 following research which showed that*
 92 *changing to a different hormone would eliminate the need to hold fish.*

93 *Sturgeon stocking since 1994 has focused on the reach between Norway House and*
 94 *Cross Lake, where the natural population was considered largely extirpated. A survey*
 95 *conducted by Manitoba Hydro and the Nelson River Sturgeon Board near Sea Falls in*
 96 *this reach in 2012 captured nearly 100 young sturgeon (McDougall and Pisiak*
 97 *2012)."*

98 **REFERENCES:**

99 McDougall, C.A. and D.J. Pisiak. 2012. Results of a Lake Sturgeon Inventory Conducted
 100 in the Sea Falls to Sugar Falls Reach of the Nelson River - Fall, 201. A report
 101 prepared for Manitoba Hydro by North/South Consultants Inc. 46 pp.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 6.4**
 2 **Effects and Mitigation Aquatic Environment; TAC Public Rd 2**
 3 **Aboriginal and/or Public Comments – 0003a; Page No.: N/A**

4 **CEC Rd 2 PCN-0012**

5 **ORIGINAL PREAMBLE AND QUESTION (PCN-0003):**

6 The results of the stocking programs described in the response to a previous request for
 7 information on sturgeon stocking programs suggests very preliminary, and mostly
 8 anecdotal results of efforts to stock sturgeon in other parts of the Nelson River, and in
 9 other river systems. Testing of artificial spawning shoals has had mixed results and is still
 10 in the early stages. Current initiatives are promising and should certainly be pursued in
 11 areas of the river system where stocks are severely depleted due to habitat loss.
 12 However, the environmental assessment suggests that a residual effect of the Project
 13 will be that stocking will increase the number of sturgeon in the reach of the Nelson
 14 River between the Kelsey Generating Station and the Kettle Generating Station.

15 It concludes that: "During the operation period, no long-term adverse effects to lake
 16 sturgeon numbers in the area directly affected by the Project are expected due to
 17 mitigation measures that provide habitat for all life history stages both above and below
 18 the generating station, and an extensive stocking program."

- 19 1. Please clarify whether this conclusion refers primarily to the numbers of sturgeon
 20 that may be found in this reach of the river at any one time, regardless of their age
 21 or reproductive capacity. In other words, if an area is stocked regularly with several
 22 thousand hatchery raised fingerlings or age 1 individuals, the numbers would be
 23 high for a time whether or not these fish survived longer-term.
- 24 2. Discuss further whether these conclusions as expressed in the EIS are warranted
 25 when the evidence for success of stocking initiatives is acknowledged to be very
 26 limited.
- 27 3. Clarify whether this conclusion is warranted given the acknowledged uncertainties
 28 surrounding the access and eventual use of future habitats by sturgeon, including
 29 proposed artificial shoals.
- 30 4. Explain whether there is sufficient evidence to conclude that the longer-term
 31 sustainability of existing reproducing populations of lake sturgeon will not be
 32 affected by this Project.

33 **FOLLOW-UP QUESTION:**

34 Sturgeon stocking programs have been reviewed by others. For example: Smith, A. L.
 35 2009. Lake sturgeon (*Acipenser fulvescens*) stocking in North America. Fish and Wildlife

36 Branch. Ontario Ministry of Natural Resources. Peterborough, Ontario. 17 p +
 37 appendices. The author of this publication concluded that: "Lake sturgeon stocking has
 38 occurred for over 20 years in some North American jurisdictions. Wisconsin and
 39 Michigan have the most advanced stocking programs and management experience.
 40 Overall, effective stocking strategies for lake sturgeon are limited due to the life history
 41 characteristics of slow maturity and long life expectancy. Stocking as a conservation
 42 strategy may be an essential tool required to rehabilitate selected lake sturgeon
 43 populations. A stocking strategy has the potential to have negative impacts on wild
 44 populations and should only be applied where a strong biological rationale exists and
 45 where other strategies have been deemed unsuitable for achieving management
 46 objectives." The Keeyask EIS does provide some discussion of the challenges faced in
 47 obtaining adequate gametes given the current low levels of natural brood stock. Can the
 48 Proponent comment further on whether the stocking strategy proposed following the
 49 construction of Keeyask has the potential to negatively affect remaining wild
 50 populations in those reaches of the Nelson River?

51 It may be self-evident given the extensive stocking program recommended, however,
 52 please clarify whether the proposed habitat recreation work in the Keeyask reaches or
 53 other reaches of the Nelson River is considered to be inadequate to support self-
 54 sustaining populations of wild sturgeon in the future in the absence of artificial stocking.

55 **RESPONSE:**

56 As discussed in the AE SV Section 6.4.2.4 and AE SV Appendix 1A Part B and the
 57 response to CEC Rd 1 PCN-0003, stocking of Lake Sturgeon is one of the most effective
 58 strategies to recover Lake Sturgeon stocks.

59 Stocking has been advocated as an appropriate species recovery tool when Lake
 60 Sturgeon population sizes are below historic levels as a result of low adult abundance
 61 and low levels of recruitment (Welsh et al. 2010). Welsh et al. (2010) note that
 62 "stocking can potentially speed the recovery of Lake Sturgeon populations by reducing
 63 the dependency on the slow process of natural recolonization". Sturgeon stocking
 64 programs have been implemented in Wisconsin, Michigan, Minnesota, New York,
 65 Tennessee, Missouri, Kentucky, Saskatchewan, Manitoba, Québec, and Ontario
 66 (summarized in Smith 2009). Stocking has also been used to improve survival by rearing
 67 wild caught larval fish in a culture facility before re-release in Michigan's Big Manistee
 68 River (Holtgren et al. 2007) and Black River (Crossman 2008).

69 There are genetic risks associated with stocking, such as loss of genetic adaptations
 70 resulting from interbreeding of genetically distinct populations, loss of genetic variation,
 71 and artificial selection of traits in hatchery rearing conditions. These effects are harder
 72 to detect in Lake Sturgeon as a result of the species' life history characteristics of slow
 73 maturity and long life expectancy. The other main risk associated with stocking is the

74 introduction of disease to wild populations. However, there are risk-adverse
 75 management approaches that can be utilized to minimize these risks (e.g., Welsh et al.
 76 2010). The Partnership's approach to disease control in stocked fish is discussed in the
 77 response to TAC Public Rd 1 DFO-0096, and the genetics of stocked fish are discussed in
 78 TAC Public Rd 1 DFO-0089, DFO-0090, DFO-0095, DFO-0097, and Brown-0006, and in
 79 TAC Public Rd 2 Aboriginal/Public Comments-0003d, and DFO-0093.

80 While Smith (2009) notes that "effective stocking strategies for Lake Sturgeon are
 81 limited due to the life history characteristics of slow maturity and long life expectancy",
 82 the same report also notes that "stocking as a conservation strategy may be an essential
 83 tool required to rehabilitate selected Lake Sturgeon populations". Smith (2009) notes
 84 that for conservation stocking a "firm understanding of population biology and available
 85 habitat is required to ensure the addition of individuals will not adversely influence the
 86 remnant population" and that the "assessment of stocking programs requires a
 87 minimum of 15-50 years (a Lake Sturgeon generation) for comprehensive program
 88 results". Both of these requirements have been met by the proposed Keeyask stocking
 89 program.

90 While there is a concern that conservation stocking could result in negative genetic
 91 effects to Lake Sturgeon populations in the Keeyask area, the consequence of doing
 92 nothing is much greater. As part of the Keeyask Project, sufficient spawning habitat will
 93 be created downstream of the station to support a much larger population of Lake
 94 Sturgeon than currently exists in Stephens Lake. Based on the absence of spawning
 95 adults in Stephens Lake, it is believed that this population will disappear with or without
 96 the Project in the absence of conservation stocking. The response to CEC Rd 1 CEC-0031,
 97 p. 7-14 provide additional information on the current status of sturgeon stocks in the
 98 areas that will be stocked.

99 **REFERENCES:**

- 100 Crossman, J.A. 2008. Evaluating collection, rearing, and stocking methods for Lake
 101 Sturgeon (*Acipenser fulvescens*) restoration programs in the Great Lakes. Ph.D.
 102 Dissertation, Michigan State University, East Lansing, MI.
- 103 Holtgren, J.M., Ogren, S.A., Paquet, A.J., and Fajfer, S. 2007. Design of a portable
 104 streamside rearing facility for lake sturgeon. North Am. J. Aquaculture 69: 317–
 105 323.
- 106 Smith, A.L. 2009. Lake Sturgeon (*Acipenser fulvescens*) stocking in North America.
 107 Fisheries Section Fish and Wildlife Branch, Ontario Ministry of Natural
 108 Resources. Peterborough, ON. 17 pp.
- 109 Welsh, A.B., Elliott, R.F., Scribner, K.T., Quinlan, H.R., Baker, E.A., Eggold, B.T., Holtgren,
 110 J.M., Krueger, C.C., May, B. 2010. Genetic guidelines for the stocking of lake

111 sturgeon (*Acipenser fulvescens*) in the Great Lakes basin. Great Lakes Fish.
112 Comm. Misc. Publ. 2010-01.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 6.4**
 2 **Effects and Mitigation Aquatic Environment; TAC Public Rd 2**
 3 **Aboriginal and/or Public Comments – 0003a; Page No.: N/A**

4 **CEC Rd 2 PCN-0013**

5 **ORIGINAL PREAMBLE AND QUESTION (PCN-0003):**

6 The results of the stocking programs described in the response to a previous request for
 7 information on sturgeon stocking programs suggests very preliminary, and mostly
 8 anecdotal results of efforts to stock sturgeon in other parts of the Nelson River, and in
 9 other river systems. Testing of artificial spawning shoals has had mixed results and is still
 10 in the early stages. Current initiatives are promising and should certainly be pursued in
 11 areas of the river system where stocks are severely depleted due to habitat loss.
 12 However, the environmental assessment suggests that a residual effect of the Project
 13 will be that stocking will increase the number of sturgeon in the reach of the Nelson
 14 River between the Kelsey Generating Station and the Kettle Generating Station. It
 15 concludes that: “During the operation period, no long-term adverse effects to lake
 16 sturgeon numbers in the area directly affected by the Project are expected due to
 17 mitigation measures that provide habitat for all life history stages both above and below
 18 the generating station, and an extensive stocking program.”

- 19 1. Please clarify whether this conclusion refers primarily to the numbers of sturgeon
 20 that may be found in this reach of the river at any one time, regardless of their age
 21 or reproductive capacity. In other words, if an area is stocked regularly with several
 22 thousand hatchery raised fingerlings or age 1 individuals, the numbers would be
 23 high for a time whether or not these fish survived longer-term.
 24 2. Discuss further whether these conclusions as expressed in the EIS are warranted
 25 when the evidence for success of stocking initiatives is acknowledged to be very
 26 limited.
 27 3. Clarify whether this conclusion is warranted given the acknowledged uncertainties
 28 surrounding the access and eventual use of future habitats by sturgeon, including
 29 proposed artificial shoals.
 30 4. Explain whether there is sufficient evidence to conclude that the longer-term
 31 sustainability of existing reproducing populations of lake sturgeon will not be
 32 affected by this Project.

33 **FOLLOW-UP QUESTION:**

34 Manitoba Hydro’s Lake Sturgeon Stewardship & Enhancement Program (2012)
 35 description states: “Augmentation and/or manipulation of flow could mitigate some of
 36 the changes in habitat (such as decreased benthic production) that may result from

37 fluctuations in water levels and flows downstream of hydroelectric peaking facilities.
38 However, manipulating or augmenting flow at one facility may require alterations in
39 flow at other facilities and is limited by water power licenses." (p.13-14) Given that the
40 application for a final water power licence for the CRD is currently being reviewed and
41 the licence for LWR will soon be reviewed, has there been any study to consider
42 alterations in flow patterns throughout the Nelson River for the benefit of sturgeon?
43 Specifically, has there been any consideration to alter flow patterns at Jenpeg or Kelsey
44 for the benefit of the downstream aquatic environment? This may be relevant to
45 Keeyask if upstream flows were altered significantly in future.

46 **RESPONSE:**

47 Manitoba Hydro operates its facilities in accordance with the relevant licences (e.g.,
48 *Water Power Act* licenses), approvals and agreements (e.g., the City of Thompson
49 Agreement) for its facilities. No changes to the operating licences, approvals and
50 conditions of CRD or LWR are being pursued. Manitoba Hydro will continue to operate
51 within its licences at Jenpeg and Kelsey, and at its other facilities. Manitoba Hydro has
52 not undertaken to do an ecological flows study at Kelsey or Jenpeg to determine what
53 operation regime would be best for fisheries or sturgeon specifically.

1 **REFERENCE: Volume: Response to EIS Guidelines; Section: 6.4**
 2 **Effects and Mitigation Aquatic Environment; TAC Public Rd 2**
 3 **Aboriginal and/or Public Comments – 0003a; Page No.: N/A**

4 **CEC Rd 2 PCN-0014**

5 **ORIGINAL PREAMBLE AND QUESTION (PCN-0003):**

6 The results of the stocking programs described in the response to a previous request for
 7 information on sturgeon stocking programs suggests very preliminary, and mostly
 8 anecdotal results of efforts to stock sturgeon in other parts of the Nelson River, and in
 9 other river systems. Testing of artificial spawning shoals has had mixed results and is still
 10 in the early stages. Current initiatives are promising and should certainly be pursued in
 11 areas of the river system where stocks are severely depleted due to habitat loss.
 12 However, the environmental assessment suggests that a residual effect of the Project
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 14 River between the Kelsey Generating Station and the Kettle Generating Station. It
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 16 sturgeon numbers in the area directly affected by the Project are expected due to
 17 mitigation measures that provide habitat for all life history stages both above and below
 18 the generating station, and an extensive stocking program."

- 19 1. Please clarify whether this conclusion refers primarily to the numbers of sturgeon
 20 that may be found in this reach of the river at any one time, regardless of their age
 21 or reproductive capacity. In other words, if an area is stocked regularly with several
 22 thousand hatchery raised fingerlings or age 1 individuals, the numbers would be
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 24 2. Discuss further whether these conclusions as expressed in the EIS are warranted
 25 when the evidence for success of stocking initiatives is acknowledged to be very
 26 limited.
 27 3. Clarify whether this conclusion is warranted given the acknowledged uncertainties
 28 surrounding the access and eventual use of future habitats by sturgeon, including
 29 proposed artificial shoals.
 30 4. Explain whether there is sufficient evidence to conclude that the longer-term
 31 sustainability of existing reproducing populations of lake sturgeon will not be
 32 affected by this Project.

33 **FOLLOW-UP QUESTION:**

34 Manitoba Hydro's Lake Sturgeon Stewardship & Enhancement Program (2012) mentions
 35 the research into sturgeon culture at the Silas Ross Memorial Sturgeon Rearing Facility;

36 the sturgeon stocking in the upper Nelson River; the spawning studies on Playgreen Lake
37 1995; and movement studies on Sipiwesk Lake to Kelsey GS.

38 Please provide the location of any reports or study plans for these studies if they are
39 referenced in the Keeyask EIS (I probably missed this), or available elsewhere. This is
40 relevant to the Keeyask EIS in furthering understanding of the state of knowledge
41 regarding mitigation measures in the Nelson River, and historical change in the Nelson
42 River to contribute to cumulative effects assessment.

43 **RESPONSE:**

44 Most of the work or studies listed in the question were projects conducted in
45 collaboration with the Nelson River Sturgeon Board (NRSB); in particular, sturgeon
46 culture at the Silas Ross Memorial Sturgeon Rearing Facility, sturgeon stocking in the
47 upper Nelson River and movement studies on Sipiwesk Lake to Kelsey GS. As such, any
48 study plans or reports would have been produced by, and may be available from, the
49 NRSB. Cross Lake First Nation is a founding member of the NRSB, through the efforts of
50 the late Mr. Ernie Scott, and therefore may already have study plans and reports on file.

51 The study of spawning habitat on Playgreen Lake in 1995 was conducted for Manitoba
52 Hydro as part of continued involvement with lake sturgeon research. The objective was
53 to provide preliminary data on lake sturgeon habitat identified by the community of
54 Norway House. The report is included on the CD of technical reports provided with this
55 filing.

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