

December 11, 2016. Vancouver, BC
Lynn Chapman, Roberts Creek, BC V0N 2W2, 604-885-2101

Remarks to the Expert Panel on EA Review:

I am not an expert. I am however a citizen with an education who has endeavoured in good faith to participate in what should be an inclusive democratic public decision-making process about the overall ability of the environment to tolerate another extractive "development". This process should be about our best science, our broadest view, our highest aspirations, our collective wisdom and our desire to protect and sustain our environment so that it in turn can sustain life.

This process should recognize the existing context of an already seriously diminished and distressed environment and the precarious nature of intact ecosystems. This process should be about accurately determining the full costs and benefits of a particular project not just to the proponent or the government of the day but to the environment, to our communities, our society and our future generations.

We do not have the right to use and abuse the environment so that nothing is left and yet the very nature of the Environmental Assessment processes I have participated in are adversarial and heavily weighted in favour of the proponent and against protection of the environment. The buzz words are mitigation, compensation, conditions, consultations, approximations, and extrapolations. Sadly the results most often are not geared to environmental protection in the public interest, in the interests of First Nations and local communities, in the interests of life sustaining biodiversity, in the interests of climate protection.

Environmental Assessment processes should of course rely upon the expertise of skilled, knowledgeable and experienced professionals and should achieve the highest possible degree of accuracy of information, understanding and opinion. Environmental Assessment processes should also rely upon the important values, knowledge, experience, reasoning and cautions of citizens and citizen groups who very often represent the public interest of environmental protection. The results of Environmental Assessments conducted in such a broadly inclusive manner should then be given full, reasoned and transparent consideration by the elected decision makers.

Failed Environmental Assessment processes create public cynicism, anger and despair and resistance. They result in poor decisions which ultimately do not protect the environment or find ways of proceeding with projects that truly balance environmental and economic needs and values. To my knowledge EA's have rarely recommended against a proponent. Failed EA processes drive the broad environmental and procedural questions through the narrow and costly interpretation of the court system. This is a breakdown in democracy and justice.

These are the areas where I would recommend improvement:

1. A name change:

2. Determination of Scope and mandate
3. Precautionary principle
4. Cumulative effects
5. Valuation of biodiversity loss, ecosystem services and functions
6. Climate Change
7. Resources, capacity and time frame for JRP
8. Currency of Information

Discussion and recommendations:

1. Name Change:

To my way of thinking the focus on “assessment” entirely leaves out the important question of Environmental Protection. The fundamental premise should be Protection of the Environment as the purpose for which the assessment:

- a) determines the degree of environmental damage that a project would create and
- b) whether that is justified by the need for the project; and then
- c) determines the responsibility for how and by whom these harms will be addressed.

I recommend consideration of “Environmental Protection Assessment” as the new name for the process.

2. Determination of Scope and Mandate:

- While scope and mandate are in different phases of the process they are profoundly connected. In my experience the mandate can and does determine the scope of the assessment. A narrowly constructed mandate will limit the scope of the assessment and thereby limit the capacity of the assessment to consider all the factors that pertain to Environmental protection.
- A lack of clarity around scope and mandate can lead to recommendations being ignored either as “outside of the mandate of” or as “not within the scope of” after the fact. A prime example of this are the recommendations of the JRP for the Site C dam project related to justification, need for, costs and alternatives to the project. Here the government included these questions in the mandate and scope of the JRP and then ignored the Panel’s recommendations as being outside the scope of the review.
- Scope of assessment is key to ensuring inclusion of all factors pertinent to a particular environment are considered. A narrowed scope constricts the ability to correctly consider and assess issues like cumulative effects and climate change impacts.
- As our environment becomes increasingly industrialized the importance and value of broadly inclusive scope and mandate in the interest of environmental protection are exponentially increased.

My recommendation is that both Mandate and Scope be expanded and inclusive of larger regional environments and determination of down and up stream effects.

3. Precautionary Principle:

This principle goes to the heart of the meaning of environmental protection. It assumes the need to err on the side of caution when predicting outcomes of projected actions on

the ecological integrity of an area. It should be a necessary component of the proponents' submissions not just a principle that opponents desperately cling to in trying to protect an environment.

My recommendation is that the precautionary principle be incorporated as a foundational aspect of assessment. And that proponents are required to consider and to demonstrate how their project includes adherence to the precautionary principle.

4. Cumulative Effects:

- Failing to properly consider cumulative effects or impacts of a project being assessed is equivalent to putting blinders on the horse of environmental protection. While it may prove convenient to limit the view to locally affected areas, the wilful blindness of ignoring cumulative effects of multiple existing and planned developments also ignores how ecosystems relate and function in real life.
- The sad example of this failure is the Site C JRP assessment which was not able to assess and address how building the dam fit into the context of massive existing and planned industrialization in the North East region of BC. Please review section 13.4 Cumulative Effects Assessment beginning on Page 254 to see the comments and recommendations of the JRP.
- Failure to fully consider the cumulative impacts of the accretion of single projects ultimately results in the breakdown of the ecosystem's ability to restore its natural function to sustain biodiversity and ultimately life. We are seeing this failure in the dramatically plummeting populations of once thriving endemic species.
- Biodiversity does not live inside the careful and convenient constructs of individual projects.

My recommendation is that Environmental Protection Assessment demands a broad and thorough cumulative impacts assessment and that this expectation be a determining feature of whether or not a project being assessed is allowed to proceed.

Secondly I recommend that Cumulative Effects assessment be an ongoing project of the Environmental Protection Minister such that governments cannot ignore or underfund this basic capacity and proponents cannot claim a lack of available data.

5. Valuation of Biodiversity loss and ecosystem services and functions:

- The question of biodiversity loss, whether we include it and how we evaluate and assess that *inside* the framework of environmental assessment has yet to be answered. One of the best studies I am aware of is entitled "Biodiversity loss and its Impact on Humanity". It calls for biodiversity to be given monetary values such that its loss is calculated in the financial cost/benefit analysis of a project.
- For your information I have excerpted the section of the Site C Joint Review Panel report dealing with Biodiversity Loss in the attachments below. It is illuminating reading.

- Indeed we have little understanding, shared language or accepted evaluative and comparative processes for this critical issue. Here I quote again from the Site C JRP report demonstrating the limitations on our ability to analyze, understand or protect biodiversity:

“the context to assess the capacity of renewable resources is based on the *Canadian Environmental Assessment Act, 2012* purpose to promote sustainable development.”

- A review of some of the language in the report aids us to see how limited and fragmented our understanding and discussion is. Examples include: “effects on biodiversity and on sustainability”; “indicates a change in biodiversity”; “natural capital”; “a sustainability framework”; “decision- and policy-makers should consider multiple interest groups and their values and uses of the land when evaluating impacts to these ecosystem services”; “high species diversity”; “health and genetic connectivity of wildlife populations”.
- By way of example I quote the Panel’s conclusion from that section that directly references my point to the JRP regarding the financial costs of Biodiversity loss that could not be assessed by the panel:
“The Panel believes that the loss of biodiversity has a cost in terms of loss to world biodiversity and heritage. As brought to the attention of the Panel at the hearing by Ms. Chapman, it also has a financial cost.”
- It is my understanding that some progress is being made in the direction of how we account for biodiversity and ecosystem services and functions within the EA process. If we fail to account for these values both physically and financially we will fail the future.

My recommendation is that all Canadian environmental assessments include processes for properly evaluating and accounting for not just the environmental costs of projects but the financial and economic costs of biodiversity loss and the loss of ecosystem services and functions.

6. Climate Change:

- If the results of Environmental Protection Assessments are to be of deep and lasting value the process and the results must include accurately evaluating and accounting for the impacts of proposed projects on Climate Change.
- In the Site C dam example the primary consideration of climate change was how it might affect future water supply. See 13.2.1.4 p 246.
- Again using the Site C dam example GHG emissions estimates were likely in error given new research on large reservoirs but at the time evaluation criteria and methodology were up to the proponent with agreement from EC. This example demonstrates the need for building capacity in EC in accurately assessing climate change impacts as well as better assessment tools to be available for EA processes.
- Assessments of climate change impacts must account not only for emissions but for the lost capacity of environments to absorb and sequester carbon.

My recommendation is to exercise real leadership in environmental assessment and make meaningful consideration of climate change impacts mandatory as part of the EA process and the determination of whether a project can be allowed.

7. Resources, time frame and capacity:

- The trend toward minimizing and localizing the EA process has resulted in a breakdown in capacity. Examples from my experience with the Site C JRP process demonstrate some of the effects of this breakdown:
 - no hearings were held in southern BC effectively excluding public participation from the bulk of the population who will nevertheless be impacted by the environmental devastation and be expected to pay for the dam. I was one of very few private citizens who flew north to participate. Teleconference participation was only for “exceptional circumstances”.
 - the massive burden of paper and information produced by the proponent was overwhelming for the panel, expert witnesses, and citizens to review, comprehend and evaluate inside the mandated time frame and with the resources available to the panel.
 - the ability of participants to find and fund expert witnesses or even to conduct the necessary research into their concerns was severely curtailed by a lack of resources. This was particularly egregious given the well funded research and expertise available to the proponent.
 - Many many people especially from the Southern BC participated through Environmental groups’ online processes. These were fundamentally statements of values and concerns about protecting the environment but inside the JRP process it was difficult to see how this public concern was meaningfully included.
- Of all the affronts to procedural fairness in inclusivity, perhaps the most egregious is the inclusion of First Nations. In my opinion this was a “damned if you do and damned if you don’t” scenario. The JRP went out of it’s way to hear from First Nations. However, to my knowledge, none of First Nations participation was held by them or the JRP as constituting “Consultation” in the legal sense of that word. They would not have participated had they understood that BC Hydro was construing their participation as “Consultation”. That issue is now before the courts.
- Resources and timeframes must be commensurate with the size and complexity of the project being assessed and allow for robust and thorough investigation and the exercise of independent judgment by the assessors.
- The EA process must ensure the ability of citizens and citizen groups to meaningfully participate. Allowing for public consultation and inclusiveness means adequate resources are applied to that purpose. Bake sales, raffles and art auctions can’t compete with well funded proponents. Limiting the location of public hearings only in the area directly affected by a project is a loss of public participation, public education and public trust.
- Proponents’ desire to streamline (read minimize and constrain) and speed up the process has held sway in the EA process. This must be addressed and must not be allowed to compromise the integrity and ability of EA’s to meet the goals of public participation and Environmental Protection.

My first recommendation is to revitalize the capacity of Environmental Assessment by ensuring sufficient time and resources to meet the goals of full and meaningful citizen participation and Environmental Protection.

My second recommendation is to allow for Panels to request additional time and/ or resources where justified by the nature, complexity and size of the project.

My third recommendation is that if Environmental Assessment is to have meaningful input and participation from First Nations there needs to be absolute clarity on the issue of “Consultation”. EA’s should not become the venue for legal consultation and that should be made abundantly clear at the outset.

8. Currency of information:

- The challenge of incorporating new and relevant information into a re-evaluation of decisions presents one of the most difficult yet important conundrums in EA decision making.
- One striking example of missing information was the report requested by the Panel and agreed to by the Agricultural Land Commission at the very end of the hearings. Involvement of the ALC was missing in the Panel and not because the Panel didn’t seek its guidance. There is no public record of that report. Was it received and reviewed? There are over 30,000 acres of farmland with many important values and no evidence that the public body most responsible was involved in giving expert testimony.
- Do we want decisions based on inaccurate, incomplete or faulty information to proceed simply because of the inflexibility of the process? Are poor decisions, once made, guaranteed to proponents?
- Should the inability of private individuals or citizen groups to gather and present critical information or research within an arbitrarily constructed timeframe constitute justification for proceeding with a project no matter the consequences?
- Where research arises that challenges the veracity of the assumptions and conclusions of an assessment should we as citizens have a pause or reset button until a further determination can be made?

My recommendation is that the panel consider what Recourses should and could exist in these circumstances.

Closing remarks:

I hope these comments are helpful to the Panel. In my view your work is vital to improving Environmental Protection in Canada. A proper and valid Environmental Assessment process is needed now more than ever. Canadians need to be able to trust this process is fair, inclusive, rigorous, thorough, open and accessible and that at the end of the day it yields wise, independent, broadly considered findings and recommendations to guide decision making. Governments need to ensure this process

meets the highest standards and does in reality protect our precious and irreplaceable environment.

Thank you for considering my comments.
Lynn

Appendix:

1. Personal information:

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2. Background and experience:

I am not an expert and have no expert opinion to provide the Panel. However I have studied as much as I could to learn about and understand what is being asked and what is at stake. My views are based on fundamental values of environmental stewardship, fair and valid public processes, and my analysis of the costs and benefits of this project. My professional experiences have been in Public Education as a teacher and as a school trustee (School District 46) for 15 years; and in Public Health as a community health worker. I believe this experience gives me a broad and balanced perspective about the merits of the Site C Dam Project, and how it will affect me and other British Columbians. (taken from my JRP submission)

Many of the views I have expressed are as a result of my experience with the Site C Dam EIS, IRP, JRP, subsequent decision making and attendance at the court cases that resulted. That is not my only involvement in EA processes but it is by far the most extensive and exhaustive and is consistent with my other involvements.

3. Link to Site C dam JRP report: <http://www.ceaa-acee.gc.ca/050/document-eng.cfm?document=99173>

4. Excerpt from JRP report re Biodiversity see below [a]

5. Link to Publication: Biodiversity Loss and Its Impact on Humanity:

Biodiversity Loss and Its Impact on Humanity <http://www.nature.com/nature/journal/v486/n7401/full/nature11148.html>

http://pub.epsilon.slu.se/10240/7/wardle_d_etal_130415.pdf

6. My JRP submission as example of citizen participation in the EA process see [b] below

[a] excerpt from JRP Report pages 262-265:

Numerous participants claimed the importance of biodiversity, and expressed concerns over the loss of wildlife if the Project goes ahead. One participant stated that constructing the Project would not contribute to the development of a sustainable relationship with the natural world.

Wendy Easton, on behalf of the Canadian Wildlife Service, stated that the Peace River region lies in an ecological location at the northern extent of the Continental Divide where the Rocky Mountains split North America into eastern and western distributions. She stated that this fact, especially for an inland region, is why the region has such high species diversity, not only for birds but for insects and other species, such as freshwater fish.

The Yellowstone to Yukon Conservation Initiative (Y2Y) said that this river section is within the Yukon to Yellowstone wildlife corridor and that keeping it open and available was critical to allow wildlife to live in and travel through the region. Some participants noted that the Bennett and Peace Canyon Dams affected this corridor, and the Project site was the last part of the corridor. The Y2Y said that this corridor was critical on a continental scale to the health and genetic connectivity of wildlife populations.

When asked by the Panel if flooding the Peace River valley could seriously increase the barrier to wide-ranging animals, Dr. Clayton Apps, on behalf of the Y2Y, replied that the Project would not likely be a barrier to movement for many wide-ranging species; however, it may still have a population-level impact with respect to fragmentation. Dr. Apps' research demonstrated that

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females are much less likely to cross a large reservoir than males, which could result in regionally specific sub-species that could theoretically lose some resilience to the larger population. Dr. Apps expected that regional human-use trends would further impact these species unless there was proactive conservation planning. Dr. Apps said that the first step in maintaining these species for future generations would be to properly characterize the existing impacts on these resources and species and identify what future impacts would likely occur given the current trajectory.

The Ministry of Forests, Lands and Natural Resource Operations (FLNRO) said that at least seven major habitat types for birds are represented in the Peace River reach, including agricultural fields, aspen parkland, banks and cliffs, north-facing cool forest, south-facing warm open slopes, gravel bars, and bottomland forest. Ms. Scheck, from the Ministry, said that these habitat types and associated vegetation communities

provide the basis for the high biodiversity of breeding birds, approximately 150 in the Peace River reach. Along with birds, butterflies and plants were cited as two other examples of taxa with high biodiversity in the Peace River reach. Mr. Ken Boon, on behalf of the Peace Valley Landowners Association, cited the high biodiversity in the area as being reason to protect the Peace valley, in particular the north bank and the islands.

Donna Lynn Chapman, a private citizen from Roberts Creek, said that BC Hydro's assessment did not account for lost biodiversity and ecosystem services and functions within the valley and downstream of the Project. Dr. Petr Komers, speaking on behalf of Sauteau First Nations, also recommended that BC Hydro present sustainability thresholds and calculate when any given threshold will or has been reached. Ms. Chapman felt that monetary values should have been ascribed where losses would occur. Her understanding was that if these costs had been included, any feasibility of Site C would be untenable. Furthermore, she noted that the costs related to lost biodiversity would not be confined to residents of the Peace River valley, but would be borne by all British Columbians. She worried that the loss of biodiversity created a debt that would hurt future generations if the Project were to proceed.

The Province said its top priority was to ensure that harvested wildlife populations are sustained over time. However, some First Nations disagreed that the Crown has managed the wildlife populations to ensure a harvestable surplus. Lindsay Staples, a consultant for the Peace Valley Landowners Association, noted that a report of the office of the Auditor General of B.C. in 2013 audited biodiversity and gave the Province a "failing grade" with respect to managing an increasingly fragmented landscape in which biodiversity is dropping rapidly.

Mr. Staples recommended that the Panel adopt a sustainability framework in its analysis. It noted that the general purpose of a sustainability framework would be to protect and provide for viable futures for upcoming generations. He stated that the key question in this assessment was "are the people in a region or in a country overall going to be better off or not?" and likened it to an assessment of "trade-offs." Rachel Darvill, a Masters student, also said that sustainable management and conservation decisions in the watershed needed to appropriately weigh and consider "short-term interests" such as the Project with the long-term impact that these kinds of projects would have for future human generations and their well-being. Mr. Staples said that it was important to recognize the interdependence of social, economic, ecological, and other considerations in adopting a sustainability framework.

Dr. Faisal Moola, on behalf of the David Suzuki Foundation, said that "natural capital" is a term that describes natural and managed ecosystems, fields, farms, forests, and other ecosystems that provide important ecological benefits to local communities, such as flood control, pollination services, hunting and fishing opportunities, nutrient cycling, and other ecosystem services. He

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said that several international agencies have urged policy-makers to carefully manage the global natural capital resources, considering that approximately 60 percent of these ecosystem services, including ones in Canada, are already degraded or are being used unsustainably. Ms. Darvill said that decision- and policy-makers should consider multiple interest groups and their values and uses of the land when evaluating impacts to these ecosystem services.

Participants, particularly from Aboriginal groups, stated that the conservation of biodiversity and existing resources in the area was important for future generations. Members of various First Nations spoke about the potential negative effects that the development of the Project would have on future generations, limiting their children, grandchildren, and great-grandchildren in continuing their cultural practices. These participants said that they are responsible for keeping the land for those future generations, a responsibility bestowed upon them by the Creator. Former Chief Garry Oker said that he wanted to leave behind a sense of identity for future generations as Dene people. Other members of Treaty 8 Tribal Association communities stated that it was already challenging to conduct cultural practices amidst the development in the region. Participants stated concerns that, because the Project would affect wildlife habitats and would result in decreased hunting opportunities, that there would be fewer opportunities to teach cultural traditions to future generations. Treaty 8 First Nations noted that ensuring cultural sustainability is very important to them.

Several participants said that the industry development in the area is already above the threshold of what is ecologically sustainable. Brian Churchill, a biologist and retired conservation officer, said that the region was already overstressed by cumulative industrial development that harmed the ecological values critical to sustainability. Reginald Whiten, an agrology consultant, said that land use planning conducted by the Province should consider the context of other projects in the area, when looking at the ability to sustain quality of life and resources. He feared that the planning process is designed to react to projects instead of plan for the future.

The Panel received close to 1,000 form letters that contested the Project because it would bring, among other things, the eradication of wetlands that support migratory birds and damage to remaining fish and wildlife.

13.5.3 Panel's Analysis

For the Panel, the context to assess the capacity of renewable resources is based on the *Canadian Environmental Assessment Act, 2012* purpose to promote sustainable

development. The Panel notes that Canada is also a member state of several international conventions and treaties that provide the framework for provincial, national, and international cooperation for the conservation and the wise use of natural resources.

The world's biological resources are recognized internationally to be vital to humanity's economic and social development, and as a result, there has been an increasing recognition that biological diversity is a global asset of great value to present and future generations. In parallel, the threat to ecosystems and species has never been so present and the growing rate of species extinction so alarming.

With these factors in mind, the Panel reviewed BC Hydro's assessment of the Project to potentially affect the capacity of renewable resources to meet the needs of present and future generations. The Panel agrees with the selected VCs by BC Hydro as being renewable (Fish and Fish Habitat, Vegetation, Wildlife, Current Use of Lands and Resources for Traditional Purposes, Agriculture, Forestry, Harvest of Fish and Wildlife, Outdoor Recreation and Tourism, Navigation, Visual Resources, and Human Health).

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The Panel completed its assessment, considering effects on biodiversity and on sustainability. The Panel recognizes that an assessment under the Agreement and its Terms of Reference largely considers these two factors, and each chapter of this report covers the specifics of how renewable VCs are affected.

Overall, the Panel's assessment indicates a change in biodiversity for Fish and Fish Habitat, Vegetation, and Wildlife. For the renewable resources identified, the Panel also concluded that significant effects would occur in the long-term for Fish and Fish Habitat, Vegetation, Wildlife, Current Use of Lands and Resources for Traditional Purposes, Navigation, and Visual Resources. The Panel views this as an effect on the sustainability of these resources.

The Panel believes that the loss of biodiversity has a cost in terms of loss to world biodiversity and heritage. As brought to the attention of the Panel at the hearing by Ms. Chapman, it also has a financial cost.

[b] JRP submission:

**SUBMISSION TO THE EA JRP RE: SITE C DAM PROPOSAL BY LYNN
CHAPMAN DEC 19, 2013.**

Submission from:

D. Lynn Chapman

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Note: Please withhold personal contact information excepting my town and province from the registry. Thank you.

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Dear Review Panel,

I am D. Lynn Chapman (not Dr. as has been published). I live in Roberts Creek BC, on the Sunshine Coast, just north of Vancouver. I am a member of PVEA but I am "self funded". I am here as a citizen to speak for myself and my family and for many, many people in my community in Southern BC who feel as I do and who cannot be here in the North to speak for themselves. This will be my **only opportunity** to participate in a public hearing because BC Hydro has not seen fit to hold any public hearings in Southern BC and the government has withdrawn the other independent review options of the ALC and BCUC public hearing processes. This panel is the **single independent public review process** for the Site C Dam Project. Shocking for a project of this size, impact and expense!

I intend to speak to the following issues: - purpose and need for the project
- alternatives to Site C Dam
- climate change

- lost opportunities including biodiversity loss
- cumulative impacts
- mitigation, timeframes, and public consultation

First a short **slide show** to get us grounded in what we are here talking about. My experience of trying to prepare for this presentation included a lot of reading. BC Hydro's EIS and IRP are massive documents that had the overwhelming effect on me of dissecting the disparate elements of all they had studied and disconnecting it profoundly from life and natural systems. When you view the slides please remember that I am not the photographer in the family.. for good reason! However I wanted to share with you some of my experience of being on the Peace River during two Paddles for the Peace.

Please look for the following things in my images:

The geology, the Peace Canyon Dam and downstream view, the boreal forest, the mud swallows' nests, weathering and instability of the land, the "Paddle" including David Suzuki, how nature sustains and balances slope instability, the islands that nurture and shelter the animals, a cute guy, a bald eagle moderately visible in the mixed stand of trees, the people of the Peace, some of the valley bottom farmland and most of all the vast and various beauty of the river and the land.

Introduction:

I would like to begin my remarks by stating that I am not an expert and have no expert opinion to provide the Panel. However I have studied as much as I could to learn about and understand what is being asked and what is at stake. My views are based on fundamental values of environmental stewardship, fair and valid public processes, and my analysis of the costs and benefits of this project. My professional

experiences have been in Public Education as a teacher and as a school trustee (School District 46) for 15 years; and in Public Health as a community health worker. I believe this experience

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gives me a broad and balanced perspective about the merits of the Site C Dam Project, and how it will affect me and other British Columbians.

I would like to speak first about **the purpose of and need for the project:**

I believe that the purpose of the project has been politically driven and that the decision to build Site C was made in cabinet and just announced by then Premier Gordon Campbell. Given this limited mandate Hydro was NOT expected nor enabled to seriously explore **and develop** the full spectrum of low environmental impact energy options nor to propose the best combination of alternatives for the future. Unfortunately, Hydro's planning capability has been severely compromised by the absence of intelligent, comprehensive, forward thinking energy strategies and legislation for BC. ***This policy failure should not be allowed to drive BC into an unwise and unwarranted decision to build Site C Dam.***

Hydro justifies the purpose for the Site C Dam project in part by having to meet expected LNG load. It just does not make ethical sense to me to flood this river valley to power fossil fuel extraction and production to sell overseas. Additionally, the huge uncertainties around LNG viability in the future do not provide sound reasons to incur the financial and environmental risks and costs of building Site C Dam.

Secondly, I believe that ***the projected energy demand numbers used to justify the need for this project are unreliable and short sighted.*** They have been shown by respected economists such as Erik Anderson to be dramatically over-inflated. Please see attached article in Common Sense Canadian. <http://commonsensecanadian.ca/bc-hydro-30-billion-blind-gamble-ipp-site-c-demand- enron-sandra-hoffman-andersen/>

Even if the estimated population increase were to be valid, the prediction of demand does not adequately recognize factors such as: a) markedly reduced consumption driven by further significant rate increases (that have already materialized and are likely to escalate) or b) increasingly more cost effective availability and use of solar, wind, geothermal and other technologies adapted for home and business energy supply that could potentially return energy to the grid.

Now I would like to speak to the topic of **Alternatives to the project.**

I believe that the EIS fails to properly consider and evaluate alternative technologies for their potential to meet future energy demand in a more diversified and environmentally sound manner than Site C Dam. Sadly, BC Hydro's mandate to build Site C does nothing to encourage it to focus on building existing, emerging, innovative "green" technologies to supply the province's long term energy needs.

One case in point is geothermal energy. While Hydro recognizes that geothermal energy appears to be an equivalent cost, and a firm and dependable energy supply

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option it has treated geothermal as currently unavailable. Hence the EIS does not give the geothermal potential of the Peace River Valley and Northeastern BC adequate weight or consideration as an alternative to building Site C Dam. Its environmental footprint would be much smaller than Site C Dam and its long term job production capability much higher.

(Note: Quote from 2013 IRP Page 3-67 **3.4.1.8 Geothermal** - "Only conventional hydrothermal resources using flash or binary technologies are considered within BC Hydro's resource option assessment. There may be potentially significant unconventional resources that could increase the potential geothermal resource base of B.C., including hot dry rock or low temperature hydrothermal resources in the sedimentary basin.")

The impacts on me and my family of this estimated \$7.9 Billion expense will be unacceptable increases in our cost of living and future debt burden, coupled with the emotional costs of grief, frustration and cynicism from the needless environmental destruction that will occur if this project proceeds. Another impact on me and my family is the **lost opportunity for a future with a robust green economy, green jobs or well planned, economically and environmentally viable energy options.**

Further, I believe the project threatens the economic and political viability of BC Hydro and thereby threatens my assurance of future stable and dependable energy for myself, my family, my community and my province. I have provided a rationale if time allows: (Note: I want BC Hydro to remain intact as a Crown Corporation to serve the public good. In my view Site C could jeopardize Hydro's stability by incurring the additional \$7.9 Billion debt and potential cost over-runs. This huge debt burden will very likely cause political pressure for privatization by putting upward pressure on rates. Indeed if rates were allowed to reflect the cost of Site C they would effectively need to be doubled. It is imprudent for BC Hydro not to adequately anticipate and assess the downward impact of rates pressure on future demand and its projections should be reassessed to include this factor. Additionally the cost of borrowing for such a debt could jeopardize BC's AAA credit rate and result in an increased cost of borrowing for BC Hydro.)

To speak briefly about climate change:

We are at a crossroads where every energy generating project must justify itself through the lenses of neutral net carbon generation and long term environmental sustainability. Building Site C Dam will not be a carbon neutral activity and it will facilitate further fossil fuel extraction. It will take us in the wrong direction! And just at the point that Site C Dam is due to come on stream and release its predictable methane, the world will be reaching the tipping point of a 2 degree Celsius increase in global temperature. That number does not include the impacts of the methane now starting to be released in volume as Northern ice melts.

My final comment regarding climate change is about **unpredictability**. BC Hydro's projections are fundamentally generated from past observations and experiences. What we can count on from climate change is that our best predictions risk being profoundly inaccurate. While we can guess that water volumes in the Peace River

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may be relatively dependable at least in the short term, **most of the values that will affect and sustain life in the future are not so reliably predictable.** This fact is not properly acknowledged or addressed by Hydro in its predictions and mitigations.

Regarding Lost Opportunities:

The lost opportunities costs of the Site C Dam derive in part from Hydro's failure to identify, develop, support or incorporate in it's planning, the potential for technological innovation which is becoming increasingly viable both economically and practically. This is short term thinking.

Lost Opportunity? Developing carbon neutral technologies that could create the sustainable “green” economy and “green” jobs BC so desperately needs and without which we cannot prosper. This would be a far better use of our money.

Other lost opportunities derive from the EIS’s failure to recognize or account for the **value of the intact Peace River Valley ecosystems** within and outside of the flood, erosion and stability zones. For example:

- It does not adequately recognize or account for how necessary this unique and rare valley bottom habitat is to plant and wildlife in northeastern BC and Alberta; or that this valley provides critical and irreplaceable winter and birthing habitat for large ungulates such as elk, moose and deer or large predators such as grizzly and black bear.

- The EIS does not adequately value the 16,000 acres of prime agricultural land and the valley’s unique microclimate that, if freed from the specter of Site C Dam, could create food security for northern BC in perpetuity; it does not recognize that its predicted population growth will put ever increasing pressure on agricultural land in BC and that we cannot afford to lose this precious resource.

- It does not adequately value the nearly 17,000 acres of mostly intact boreal forest ecosystem and its carbon sequestration and climate change adaptation capability.

- The EIS does not adequately recognize or acknowledge downstream impacts, habitat connectivity nor does it assess the question of unintended consequences.

Lost opportunity?: The ability of this valley to continue its life sustaining capability into a future far beyond the possible 100 year life span of Site C.

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Regarding biodiversity, I would like to submit a June 2012 meta study entitled **Biodiversity Loss and Its Impact on Humanity** [http://pub.epsilon.slu.se/10240/7/wardle_d_et_al_130415.pdf]. It opens with the following statement:

“The most unique feature of Earth is the existence of life, and the most extraordinary feature of life is its diversity. Approximately 9 million types of plants, animals, protists and fungi inhabit the earth. So, too, do 7 billion people. Two decades ago, at the first Earth Summit, the vast majority of the world’s nations declared that human actions were dismantling Earth’s ecosystems, eliminating genes, species, and biological traits at an alarming rate. This observation led to a daunting question: **How will loss of biological diversity alter the functioning of ecosystems and their ability to provide society with the goods and services needed to prosper?**”

The next paragraph opens with this hopeful statement: **“In the last 20 years, we have made remarkable progress towards answering this question.”**

Indeed there has been progress towards monetizing the costs of biodiversity loss and in my view this study and other possible approaches such as Natural Capital Analysis must inform the Panel’s thinking.

Unfortunately, lost biodiversity and ecosystem services and functions within the valley (and downstream), are not accounted for as a whole nor as a monetary cost in the EIS. But they should be! I believe that if these costs were included, any feasibility of Site C Dam would be untenable.

Lost Opportunity?: The ability to more fully and accurately understand and account for what will be lost if the rich biodiversity of the Peace River Valley and its ecosystem services and functions are destroyed by Site C Dam.

The **impacts of these lost opportunities** are not confined to the people of the Peace River Valley. I and all other British Columbians will bear the costs whether we know it or not. Loss of prime agricultural land and its food security capability hurts us all now and into our increasingly uncertain future. Loss of the rich biodiversity of the Peace River Valley hurts **life not just people**. The incredible debt to build this unnecessary dam hurts us all for generations to come. Indeed the loss of the Peace River Valley to Site C Dam will hurt us all far, far beyond any possible benefits we might derive in the short term.

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Regarding Cumulative Impacts:

Others more qualified than I will speak to the issues around cumulative impacts. I simply want to say that the significance of these impacts must not be underestimated. I do not believe that the EIS contemplated the **“exponential”** nature of the predicted and unpredicted cumulative impacts on an ever decreasing amount of our ecologically intact land base. Some people say the Peace River has two dams already so a third one just makes sense. ***I say that the Peace River Valley has born enough of the burden of Hydroelectric development for this province and must not suffer further harms!***

Regarding Mitigation and Time-frames:

The Canadian Oxford Dictionary defines mitigation as: “make milder or less intense or severe”. A more cynical online thesaurus provides this synonym: “palliate” or the related definition: “defend, explain, clear away, or make excuses for by reasoning”.

In my view the mitigation measures proposed in the EIS provide “palliative care” to the affected and downstream parts of the Peace River Valley. The harsh reality is that nothing will mitigate the loss of the river’s birthing and overwintering islands to the life forms that depend on them; nothing will mitigate the loss of this rich valley bottom agricultural capability to future generations who will need that resource to survive; nothing will mitigate the impacts of the biodiversity losses that will accrue and intensify over time if this valley is flooded! I could go on. ***In my view, all the disparate measures described as mitigation will not fundamentally change the harms to the whole ecosystem and they should not be seen as enough to justify the project.***

My second comment regarding mitigation relates to timeframes. The Panel will know that many of the mitigation measures that Hydro proposes will take place over extended time frames. I have no doubt that the people speaking for Hydro today are sincere in their belief that the measures proposed will be followed through as undertaken. But ***I ask the Panel not to ignore the temporal nature of “good intentions” - even those that are supposed to be legally binding.*** There is a rich history of agreements that change or disappear with time and ***after the fact.*** There is absolutely no way to predict the impact of climate change on our governments’ future ability to pay for today’s promised mitigations. The signs are not good!

One final comment about timeframes: ***It cannot have escaped notice that when Site C Dam is completed it will effectively be 60 years old.*** Hydro relies on the continued integrity of the WAC Bennet Dam, completed in 1968, not only for Site C’s structural integrity but for its justification. As part of its justification, Hydro maintains that Site C Dam would take advantage of water already stored in the Williston reservoir upstream and would have a relatively small reservoir for the amount of energy produced. The evidence about dam reliability and safety after 50 years, calls this judgement into question.

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Closing Remarks:

I do not believe that the people of BC would support Site C Dam if they were fully appraised of its real costs and impacts. The results of the IRP 2013 Consultation demonstrate this clearly. Quote: ***“BC Hydro acknowledges the strong opposition to the Site C Project voiced by the majority of the members of the public, stakeholders, First Nations and TAC who chose to participate in this final round of consultation.”***

I draw your attention to Hydro's particularly cynical and dismissive note regarding the views of those consulted for the IRP. Quote: ***“They may not be representative of the***

views of the public and other stakeholders more broadly because participants self-selected into the consultation process.”

I trust that this Panel will respect and listen to the many people who took the time to register their opinions and deep concerns about this project through online websites such as stopsitec.org. I hope this Panel will understand the challenges for most citizens, especially in the south, of being able to participate in processes as daunting as this one.

BC Hydro would have us believe that the impacts and costs of Site C are unfortunate but are outweighed by the benefits. I say this is not so! There are better solutions to meet our energy needs.

BC Hydro has failed to recognize how unique and irreplaceable the Peace River Valley really is - it is **NOT just another valley** and it is definitely NOT a wise or acceptable site for a 3rd dam. ***Again I say that the Peace River Valley has borne enough of the burden of Hydroelectric development for this province and must not suffer further harms!***

Please protect our environment. Please protect the Peace River Valley. Please reject the Site C Dam Project.

Thank you for your time and kind attention to my remarks.

I have two follow up questions if time allows.

Question: Will the panel consider the economic and environmental aspects of lost biodiversity and ecosystem services and functions in its consideration of the full costs and benefits of Site C? Please explain.

Question: Will the panel consider Site C's Dam's enormous environmental impacts in the context of the existing and planned development in Northeastern British Columbia **and** over a longer time frame than the EIS contemplates? Please explain

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ATTACHMENTS

A) Electronic Submission Attachments:

1. Regarding Erik Anderson in Common Sense Canadian

<http://commonsensecanadian.ca/bc-hydro-30-billion-blind-gamble-ipp-site-c-demand-enron-sandra-hoffman-andersen/>

2. Quote from on-line Journalist's Resource from Harvard Kennedy School: <http://journalistsresource.org/studies/environment/ecology/biodiversity-loss-impact->

humanity# “[The] loss of higher consumers can cascade through a food web to influence plant biomass. Loss of one or a few top predator species can reduce plant biomass by at least as much as does the transformation of a diverse plant assemblage into a species monoculture.”

3. Regarding **Biodiversity Loss and Its Impact on Humanity** <http://www.nature.com/nature/journal/v486/n7401/full/nature11148.html>

http://pub.epsilon.slu.se/10240/7/wardle_d_etal_130415.pdf

4. Regarding slide presentation link:

<https://vimeo.com/user23489358/videos>

B) Written Submission Attachments:

Attachment 1.

BC Hydro’s IRP Chapter 7 - Consultation - November 2013 - Excerpts Page 7-47

Hydro’s Note:

Note that the views represented in this chapter reflect the priorities and concerns of the public, stakeholders and First Nations who participated in consultation at that time. ***They may not be representative of the views of the public and other stakeholders more broadly because participants self-selected into the consultation process.***

WRITTEN FEEDBACK SUMMARY (re Aug 2013 IRP)

Page 7-87 Powering Tomorrow

(My note: There were no options given to power tomorrow except those including Site C)

The large majority of respondents who completed the comment form responded with strong disagreement with the recommended action to advance Site C.

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Reasons given included lack of demonstrated need; the flooding of agricultural land, wildlife habitat and First Nations heritage sites in the Peace River Valley; lack of affordability; and lack of First Nations support.

Many respondents believed that Site C is being built to serve projected LNG load, which they had expressed opposition to in the first question.

Some respondents encouraged BC Hydro to look to alternative energy options such as wind, tidal, geothermal and solar instead of building Site C.

With regard to those who voiced support for Site C, reasons included: it’s the best source of clean, economical energy and it is smart economics because it uses a developed river system.

Concerns expressed by many IPPs and energy related companies about advancing Site C included the overstating of wind costs; alternatives are needed that provide more opportunities for First Nations economic development; it needs independent third-party review; natural gas should be considered as an alternative; and capital cost risks are understated. Some expressed the view that other renewable power projects should be advanced at the same time and some pointed to the need to advance specific technology types.

With regard to those who voiced support for Site C, reasons included: it's the best source of clean, economical energy and it is smart economics because it uses a developed river system.

FIRST NATIONS INPUT Page 7-88

Most comments opposed the recommended action relating to Site C or deferred to the First Nations' that are impacted by Site C.

The First Nations from the Site C project area were critical of the approach to Site C taken in the IRP which was thought to unduly favour Site C compared to other resources. First Nations opposed Site C on several grounds including the environmental impacts of large scale flooding and the project impacts on the exercise of treaty and aboriginal rights; the concern that the development of Site C will displace demand for small scale independent power projects which benefit First Nations and are viewed as more sustainable; the risk of cost overruns and the risk associated with uncertainty about future need for the project; and questions about the implications of Site C for gas development in the northeast of the Province.

Many First Nations commented that they were concerned about the lack of opportunities for clean or renewable energy development in the IRP and that this is at odds with provincial commitments to enhance First Nation opportunities in this sector. These concerns were raised in relation to many aspects of the IRP. There were several suggestions on how to create opportunities for First Nations, including an expanded Standing Offer Program and Net Metering Program, new calls for power, and priority to projects that involve First Nations participation and support.

TAC INPUT PAGE 7-88

All eight TAC members expressed concerns with pursuing Site C for its identified earliest in- service date. Specific advice included: revisiting the timing and need for Site C; delaying the project; providing an independent review of BC Hydro's in-house cost estimate; submitting it for BC Utilities Commission (BCUC) oversight; and finding more cost effective ways to meet load. It was suggested that the analysis required strengthening through cost overrun sensitivities and a deferral analysis, and it was asserted that better alternatives are likely available that would provide greater flexibility and reduced risk.

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TAC members also expressed concerns with respect to Site C risks associated with cost overruns and uncertainty that the anticipated loads will materialize given commitment to the project need to be made well in advance of loads coming on line. It was asserted with a cost of approximately \$8 billion, the project with the associated cost risks in combination with uncertain load becomes less attractive. Other concerns included incompleteness of environmental analysis comparisons and lack of BCUC.

HYDRO'S RESPONSE PAGE 7-87

BC Hydro acknowledges the strong opposition to the Site C Project voiced by the majority of the members of the public, stakeholders, First Nations and TAC who chose to participate in this final round of consultation.

Because Site C is the most cost-effective, clean resource available to meet the need for both energy and dependable capacity in the following decade (after forecast energy demand is cut by over

two-thirds through conservation), **BC Hydro continues to recommend advancing Site C** (subject to: environmental certification; fulfilling the Crown's duty to consult and where appropriate accommodate Aboriginal groups; and Provincial Government approval to proceed with construction.)

Note: I am not now able to find the document with Hydro's rationale on their website but I do have it as a pdf file if requested.

Attachment 2.

Excerpts from Wikipedia:

http://en.wikipedia.org/wiki/W._A._C._Bennett_Dam#Downstream

PLEASE NOTE: I attached the following excerpts from Wikipedia regarding social and environmental impacts of the WAC Bennet Dam Construction and mention of impacts on Hudson's Hope with the intention of demonstrating that impacts from the first dam on the Peace River continue and to give a perspective on unintended or unpredicted consequences. It is not to deny the economic and development benefits at a time when the landscape of BC was largely undeveloped.

Local community and workers[\[edit\]](#)

The building of the dam and the powerhouses and the creation of Williston Lake provided economic opportunities to the high number of workers who found employment with BC Hydro or one of the subcontractors; these workers included members of the local first nations, non-native residents, non-residents, and immigrants.[\[49\]](#) One of the subcontractors was the Forest Service Branch of the Department of Lands and Forests to whom BC Hydro paid \$5 million to clear the area that would become Williston Lake - an area that was covered in timber to 80%.[\[5\]](#) At the peak of project, 3500 workers were employed.[\[50\]](#) Many of them

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had moved to the area for the job and settled down, at least temporarily, in close proximity to the dam project. [Hudson's Hope](#), a frontier town, was one of the communities in which many of the non-resident workers found a home; during the project, the population of Hudson's Hope rose from 800 to over 5000 in 1968 and dropped to less than 1500 by the early 1980s.[\[51\]](#) In addition, about 2000 workers lived at a camp in close proximity to the dam.[\[51\]](#)

Social impacts[\[edit\]](#) **Aboriginal communities**[\[edit\]](#)

For a minority of people, many of whom were Aboriginal, environmental changes caused by the damming of the Peace River meant dependence, isolation, alienation, and illness.[\[16\]](#) When it became clear that the environmental impacts of the dam would render land unlivable to local Aboriginal groups who were dependent on the hereditary sites, the British Columbia government offered a settlement. For 1.7 million dollars the British Columbia government purchased fourteen thousand acres of land, including timber and mineral rights, and bought out approximately one hundred and fifty individuals and families securing the rights to the land.[\[6\]](#) Of those one hundred and fifty, roughly one third were members of the [Tsay Keh Dene](#) First Nation.[\[52\]](#) Outside of relocation, Aboriginal hunting and fishing grounds around the Fort Grahame and Finlay Forks areas were severely impacted by ecological change. Many species of fish as well as mountain caribou and muskrats were no longer available for Aboriginal consumption or traditional use. These changes to First Nations independence through [fur trade](#) and the relocation of many Aboriginals to new reserves caused an influx in demand for government assistance through welfare.

Between 1965 and 1970, social assistance provided by the Provincial government to Aboriginal groups in the areas surrounding the Bennett Dam increased by 300 percent.[8]

As recently as October 2008, the [Kwadacha First Nation](#), another Aboriginal group residing in the [Fort Ware](#) area located at the north end of the Finlay Reach of Lake Williston, reached a settlement with the British Columbia government and BC Hydro over damages suffered during construction and operation of the dam and Williston Lake. The settlement included a \$15 million lump-sum payment and annual payments of \$1.6 million adjusted for inflation.[53][54]

Local residents[\[edit\]](#)

When the government, controlled by the [Social Credit Party of British Columbia](#), dammed the Peace River to generate [hydroelectricity](#) it had already set into motion a series of social changes in the surrounding communities.[55] These social changes had positive effects for workers who flocked to the area to secure

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jobs and economic opportunities unavailable elsewhere. It also had negative effects for residents who lived in the surrounding areas prior to the dam's construction. British Columbia Premier [WAC Bennett](#) saw growing communities when he envisioned the damming of the Peace River in 1952.[11] In 1964, his vision would be validated as a result of the “instant town” of [Mackenzie](#), where thousands of individuals would find employment in the Forest Industry which was a direct result of clearing land for the construction of the dam. [52] For residents who had lived in the surrounding areas prior to the dams planned construction, development caused many to be pushed off homesteads for small monetary settlements. One resident who owned a thousand acres of land, much of which was used for farming, was offered only twenty-eight thousand dollars by B.C. Hydro to secure the property. [16] However, for local residents of Anglo ethnicity, full-time waged work was more easily accessible due to the employment opportunities produced directly and indirectly by the damming project.[16]

Environmental Impacts[\[edit\]](#) **Downstream**[\[edit\]](#)

The W.A.C. Bennett Dam held tremendous economic potential, but for its surrounding environment the experience was not so positive. Since its construction a number of environmental changes have taken place. The dam has been responsible for drastic fluctuations in the water levels of the upstream and downstream portions of the Peace River, creating modifications to both the plants and animals in the region. In addition, it has also been blamed for creating changes in the landscapes of the [Athabasca Lake](#) and Peace River, known as the Athabasca Delta .[56] This part of the river faced significant water loss. While the area of the Peace River immediately upstream of the dam was experiencing flooding, which gave rise to [Williston Lake](#), downstream the Peace-Athabasca Delta was drying up .[57] For this reason, the delta experienced several changes in the water level, affecting both the landscape of the delta and its aquatic life.

Following the completion of the Williston Lake in 1971, water coverage was reduced to 38 percent and the amount of wetlands and wet marches declined to 47 percent .[58] Floods that occurred every two or three years came to a halt, no longer able to revitalize the biodiversity alongside the delta. A reduction in the amount of discharge resulted in the accumulation of toxins and sediments downstream, decreasing water the quality of the water. Fish also experience changes as a result of the low water levels: fewer channels were accessible for Walleye to reach spawning grounds and for juvenile fish to reach nursery areas therefore jeopardizing their ability to reproduce. Dinosaur Lake was created

directly downstream of the W.A.C. Bennett Dam when the [Peace Canyon Dam](#) was completed. The Peace Canyon Dam was built to maximize the generation of hydro-electricity that the W.A.C. Bennett Dam couldn't capture.^[4] Today, it is a popular destination for camping in British Columbia.

Upstream and Williston Lake^[edit]

The area upstream of the dam experienced a number of environmental changes as a result of the flooding of the land. The creation of the lake flooded a vast area of forested land, drowning a significant amount of wildlife and creating drastic changes to the landscape and climate. It created a reservoir that measured 250 kilometers from north to south and another 150 kilometers from east to west. Farmers had asked for compensation from BC Hydro because the changes were created in the weather compromised their ability to grow crops.^[6] Because the water was no longer flowing, rather standing still following the creation of the dam there was an increase in humidity in the area. This caused cooler temperatures and an increase in fog.

Not only did changes occur in the atmosphere, they also occurred in the water. The creation of the reservoir compromised the livelihood of aquatic life, which before the dam lived peacefully in the river .^[56] Rivers and lakes support different species therefore some fish were able to thrive in the lake but others could not be supported by its different environment. Mountain whitefish, rainbow trout and arctic grayling were primarily the species that faced decline. A number of species were known to have thrived and it is estimated that there are more fish in the basin today than before the reservoir, but scientists indicate they are not entirely healthy .^[59] High levels of mercury have been measured in the lake, as a result of decaying matter from the plants and trees that drowned. Mercury accumulates in the lake and ingested by tiny organisms and eventually makes its way up the food chain. In the year 2000 British Columbia issued a Fish Consumption Advisory for bull trout and dolly varden warning people about the high content of mercury in these fish .^[60]
