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December 22, 2011

Secretary to the Joint Review Panel
Enbridge Northern Gateway Project
444 7 Ave SW
Calgary AB T2P 0X8

Attention: L. George

Dear Madam:

Re: Enbridge Northern Gateway Project
Hearing Order OH-4-2011
Written Evidence of East Prairie Métis Settlement

We represent East Prairie Métis Settlement ("EPMS") with respect to Enbridge Northern Gateway Project. Please find the written evidence of EPMS attached.

Yours truly,

ACKROYD LLP

<original signed by>

Will S. Randall II
WSR

1. East Prairie Métis Settlement ("EPMS") is a Métis Settlement as defined in the *Métis Settlements Act*[1] located approximately 40 km to the southeast of High Prairie, Alberta. EPMS covers 32,635 ha. More than 800 people reside at EPMS.
2. The Enbridge Northern Gateway Pipeline Project (the "Project") will run through the traditional lands of EPMS. The Pipeline is located approximately 80 km to the south of the EPMS lands.
3. Per section 36 of the *National Energy Board Rules of Practice and Procedures, 1995*[2], this submission serves as the written evidence of EPMS for the Joint Review Panel (the "Panel"). This submission will first indicate the position of EPMS, then summarize the history of EPMS, and its members' use of the lands, then it will summarize the environmental concerns of EPMS with respect to the Project, and finally it will discuss how the EPMS plans to participate in the hearing.

POSITION OF EPMS

4. EPMS is neither opposed to nor supportive of the Project as it has been applied for, and EPMS indicates that its position may change to outright opposition or support depending on negotiations with Enbridge, the Crown, conditions of the Panel, or other factors. EPMS has reviewed the Project and it has numerous concerns that it would like to bring to the attention of the Panel. Furthermore, EPMS submits that both the federal and provincial Crowns should require more thorough and robust environmental assessments to ensure that the Crown adequately protects the rights of aboriginal people.

EPMS HISTORY AND CULTURE

5. EPMS members are Métis people who are the descendents of unions between European traders and Indian women, who developed a *sui generis* culture that is neither entirely European nor entirely Indian in nature. Métis people, along with Indians and Inuit, are one of the three aboriginal peoples recognized in section 35 of the *Constitution Act, 1982*.[3] That Métis people are expressly part of section 35 of the

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[1] RSA 2000, c M-14.

[2] SOR/95-208.

[3] *Constitution Act, 1982*, being Schedule B to the *Canada Act 1982* (UK), 1982, c 11.

Constitution Act, 1982, indicates that they have a special relationship with the Crown. As Métis people, they enjoy the aboriginal right to hunt, fish, trap, and gather for food, ceremonial, and medicinal purposes.[4]

6. Métis Settlements are unique in Canada in that they provide a land base for Métis people to live, work, and practise their aboriginal rights. The creation of the Métis land base in Alberta was a long struggle.
7. In 1934, the Ewing Commission, an Alberta Royal Commission, investigated the conditions of the Métis in Alberta. In 1936, the Ewing Commission Report called for the establishment of Métis colonies on lands held by the Crown for the exclusive use of the Métis.
8. Following the recommendations of the Ewing Commission Report, in 1938, the Province of Alberta enacted the *Métis Population Betterment Act*,[5] which established the Métis Settlements.
9. On June 3, 1985, the legislature of the Province of Alberta unanimously endorsed Resolution 18, a "made-in-Alberta" strategy, which recognized the need for Métis self-government in light of section 35 of the *Constitution Act, 1982*.[6] Resolution 18 led to the Alberta-Métis Settlements Accord, 1989, a package of legislative agreements between the Métis settlements and the Province of Alberta. The legislation created a new framework for the self-governance of Métis lands.
10. Included in the package of legislation is the *Constitution of Alberta Amendment Act, 1990*,[7] which amends Alberta's unwritten Constitution, which recognizes the contribution of the Métis to Alberta's history, and which protects a Métis land base.
11. The preamble of the Constitution of Alberta Amendment Act, 1990 provides insight into the purpose and objective of the legislation, and it reads as follows:

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[4] See generally *R. v. Powley*, 2003 SCC 43.

[5] SA 1938, 2nd Sess., c.6.

[6] *Supra* note 3.

[7] RSA 2000, c. C-24; see also *Alberta (Aboriginal Affairs and Northern Development) v. Cunningham*, 2011 SCC 37, para. 18.

a. WHEREAS the Métis were present when the Province of Alberta was established and they and the land set aside for their use form a unique part of the history and culture of the Province;
b. WHEREAS it is desired that the Métis should continue to have a land base to provide for the preservation and enhancement of Métis culture and identity and to enable the Métis to attain self-governance under the laws of Alberta and, to that end, Her Majesty in right of Alberta is granting title to land to the Métis Settlements General Council; and
c. WHEREAS Her Majesty in right of Alberta has proposed the land so granted be protected by the Constitution of Canada, but until that happens it is proper that the land be protected by the Constitution of the Province.[8]

12. Although the Métis formed communities, they originated from people who travelled across wide swaths of what now comprise the Prairie Provinces of Canada and the Upper Midwest of the United States to trade, hunt, trap, and gather by canoe, cart, horse, and foot.
13. In the 19th century, the Métis formed communities across what were then Rupert's Land, the Northwest Territories, and Manitoba. EPMS members are largely descended from the historic Métis communities of St. Albert, Alberta and Lac Ste. Anne, Alberta.
14. The Swan Hills of Alberta were a favoured hunting area of these historic communities. During European settlement of Alberta, the Métis people were forced to the margins of settled European areas, and eventually to the area that now comprises EPMS, which is proximate to the Swan Hills.
15. To this day, the Swan Hills remain a favoured harvesting area for EPMS members, even though members often practice their aboriginal rights across western Canada. In the Swan Hills, on EPMS lands, and in other areas across western Canada, members of EPMS hunt for caribou and deer, among others; gather plants, roots, and berries; fish for trout and other species; and trap furbearers for sale and clothing.

[8] RSA 2000, c. C-24.

16. Enbridge has contended that it does not need to consult with EPMS since it is between 80 to 100 km from the Project. EPMS members often practise their aboriginal rights much further than 80 km from the Settlement land. EPMS members disagree with the Métis Hunting Policy of the Province of Alberta, but, even that provincial policy, contemplates a hunting radius of 160 km from Settlement lands. At a minimum, Enbridge should consult with Métis communities within 160 km of the pipeline, since Alberta recognizes that radius for hunting purposes.
17. The Crown has no consultation policy with Métis people. Without a consultation policy, EPMS members worry that unfettered development will eventually result in the widespread infringement of their aboriginal rights.
18. The Project as applied for will traverse the area in which EPMS members practise these aboriginal rights, and EPMS members are concerned that the construction, operation, and abandonment will infringe on these aboriginal rights. To better understand what effects the Project will have on the environment, EPMS asked its solicitors to retain experts to provide them with this information, and well as provide this information to the Panel.

ENVIRONMENTAL IMPACTS

19. EPMS retained Summit Environmental Consultants Inc. ("Summit") to review the Project's Environmental Impact Assessment ("EIA"), especially with respect to the effects of the Project on the EPMS' traditional land use. Summit reviewed Volumes 1, 6A (Parts 1 and 2), 7A, and 7B of the EIA to better inform EPMS members of the Project's impacts on vegetation, wildlife, and aquatic resources (including water quality, fish, and fish habitat). We will summarize Summit's findings of the effects of the Project, as well as Summit's recommendations to enhance the EIA so that the Panel will be better informed in its decision-making process. We attach the Summit report to this submission so that the Panel will have the original document to assist it in decision-making.
20. The principal matter of concern to EPMS with respect to the environment is that the Project will impact aboriginal rights.

VEGETATION IMPACTS

21. EPMS is located within the Southern Alberta Uplands (SAU) physiographic region. The SAU region, which is crossed by 350 km of the proposed pipeline route (Green Court, Alberta to the Alberta-British Columbia border), represents 29% of the total Project study area. Vegetation communities within the SAU region include mixed forests of white spruce, black spruce, lodgepole pine, aspen, paper birch and balsam poplar within upland areas. Lowland areas characteristically contain scattered black spruce, tamarack, and graminoid dominated wetlands. Old growth forests occupy 9% and wetlands occupy 7% of the region. Out of all the physiographic regions impacted by the project, the SAU has the largest extent (4,576 ha) of wetland and riparian ecosystems. Twenty-four rare plant species were identified, no rare ecological communities were identified, sixteen regulated weeds were observed, and merchantable timber is estimated at 338,000 m^2.
22. Summit found that EIA contained a generally sufficient vegetation assessment, but noted that the assessment did not include riparian vegetation. In Volume 6A, Part 1, Section 8.4.3.4, pg. 8-808, the EIA indicated that impacts to wetlands and rare plans is reversible, when, in Summit's view, such impacts are irreversible. The inclusion of riparian vegetation would give the Panel and aboriginal people a clearer idea of the effects of the construction and operation of the pipeline, as well as the effects of spill on riparian vegetation.
23. Summit found that Enbridge will employ third party contractors to care for any rare plan species that are transplanted. This may be an inadequate solution to protect such plants in the long term, and Enbridge should consider involving research and scientific organizations in the process.
24. With respect to monitoring the Project's impacts to vegetation, Summit found that the EIA makes broad promises whilst providing no concrete plan for monitoring. Monitoring impacts on vegetation is important in determining the survival of rare plants long the pipeline route. The EIA does not discuss issues related to plant habitat reclamation and remediation after a spill, including studies to assess the change in vegetation after a spill.
25. Summit identified that Enbridge may not have adequate aboriginal traditional knowledge of an environmentally sensitive area affected by a hydrocarbon spill if

Enbridge has not completed a local, site-specific assessment. EPMS encourages the Panel to require Enbridge consult with aboriginal peoples prior to construction this matter to ensure that environmentally sensitive areas are adequately protected.

26. The ability to gather native plant species is integral to the aboriginal rights of EPMS members, and the shortcomings of EIA will have an negative impact on the ability of EPMS members to practise their aboriginal rights in the Project area.

WILDLIFE

27. Summit found that the EIA's characterization of the Project not having a significant effect on wildlife as being unsubstantiated. The Boreal Taiga Plains in this region of Alberta has a high percentage of species (birds in particular), although Enbridge provides minimal population data. Habitat degradation is increasing due to continued high levels of oil/gas exploration resulting in forest fragmentation and increased public access. In general (inclusive of this assessment, but not limited to it), there is existing habitat loss that is not quantified in the reports, potential impacts are not thoroughly assessed and baseline data is lacking.

28. Specific to this assessment, there is no indication if long-term monitoring of terrestrial landscapes and animals is planned or if there is any commitment to monitoring population data or wildlife movement patterns/behaviours in relation to the presence of the pipeline. Furthermore, the EIA shows that local surveys were too few in number or too short in duration to present useful date to the Panel with respect to wildlife impacts. Overall, Enbridge should identify impacts of the cumulative loss of habitat as it relates to the lifespan of the pipeline, from initial construction to complete decommissioning, when the landscape is fully reclaimed.

29. Summit identified cases in which the EIA used migratory species, invasive species, or species with limited ranges as indicative of the Project's impact on wildlife, when the EIA should have used species that occur widely along the path of the proposed pipeline. For example, the EIA uses owl populations that appear only on the British Columbia coast, are invasive species, or do not appear at higher elevations as indicative of the Project's effects on forest-dependent species. This is not useful to gauge the Project's impacts on owls, and, moreover, is generally irrelevant to

aboriginal people in Alberta. Enbridge should use more generalist species native to the Project area rather than species that only have limited ranges.

30. The EIA inadequately identifies the effects on wildlife of herbicides used to control weeds and other invasive species in the right-of-way. Summit identifies long-term herbicide use as having a greater effect on wildlife in the study area than mere short-term herbicide use.
31. Summit found that, while the EIA identifies that Enbridge will limit hunting by Project personnel, there is no plan to limit hunting or gathering by non-personnel. The increased access via the right-of-way and access roads could increase pressures on wildlife from increased hunting.
32. With respect to animal dens, Summit identified that the EIA lacks a coherent plant to avoid denning sites in the clearing and construction process. Furthermore, the EIA does not discuss how or if Enbridge has identified denning sites. We suggest that Enbridge work with aboriginal people and regional biologists across the Project area to better identify and protect denning areas.
33. The EIA states that Enbridge will avoid disturbing caribou habitat during critical activity periods (such as breeding or migration). However, the EIA does not clearly state how this will be done and how caribou would be moved from the path of construction. Furthermore, while the EIA includes a risk assessment for marine mammals, the EIA does not include a risk assessment for large land mammals such as caribou.
34. With respect to birdlife, the EIA lacks sufficient information about the Project's effects on migratory bird habitat, even though information on stop-over sites, staging, and seasonal habitats is readily available. Enbridge should commit to better long term monitoring of the Project's effects on migratory birds via a program such as Environment Canada's Partners in Flight.

AQUATIC RESOURCES

35. Some of the key rivers that will be affected by the Project between KP 200 and KP 500 are the Athabasca, Wapiti, Smoky, Little Smoky, Simonette Rivers and a number of important tributaries to these rivers. Salmonid fish that may occur in these rivers include brook trout, rainbow trout, bull trout, Arctic grayling and mountain

whitefish. Other key large-bodied fish species include burbot and goldeye. Construction along the pipeline RoW will require clearing riparian vegetation, installation of pipelines under watercourses, creation of permanent and temporary access roads (including culvert installation and bridge construction on watercourses) and infilling watercourses. Operations will involve maintenance of the pipelines, power lines and road crossings. Activities for decommissioning are limited to removal of water crossing structures.

36. The project activities that could affect water quality, fish and fish habitat are: vegetation clearing; use of industrial equipment; excavation and grading; placement of material structures in water; use of explosives; water extraction (both hydrostatic testing and other uses); and structure removal.
37. The potential impacts to surface water caused by the construction, operation, and decommissioning of the project include: degraded water quality and impacts on aquatic biota caused by spills or leaks due to failure of the pipeline structure; degraded water quality caused by project-related erosion of disturbed riparian areas and streambeds; vibration impacts caused by blasting; change in timing, duration and frequency of river flows; impacts to spawning habitats, egg incubation and early life history stages of important fish species; and reduced fish populations caused by increased public access to important fisheries.
38. Enbridge has not clearly provided in its EIA setback distances from watercourses. Using minimum setback distances can have a negative impact on fish habitat by reducing shade and introducing suspended sediments.
39. Enbridge did not clarify in the EIA whether or not it would seek approvals to construct the pipeline during restricted activity periods for fish in Alberta rivers. It is important for the Panel to know whether construction would proceed during such periods, since there is a heightened risk to fish and fish habitat during construction. Enbridge should inform the Panel and interveners if it will be seeking a variance in watercourse crossings during the construction period, and, if so, at which points on which rivers Enbridge will seek such a variance.
40. Enbridge does not provide an emergency response plan in the event of a spill in a western Alberta river. Furthermore, the EIA does not provide any examples of a

scenario in which a major spill occurs in a river in western Alberta. Without this information, traditional users of the river and river resources are less informed about the potential impacts on the project.

HEARING PARTICIPATION

41. The Métis people have an oral tradition. EPMS members, rather than their lawyers, are in the best position to articulate their concerns and positions to the Panel.
42. EPMS has limited resources to participate in the Project review, despite having applied for and been granted funding by the Canadian Environmental Assessment Agency. Given the small funding envelope available, EPMS joined Horse Lake First Nation in retaining environmental consultants to review the EIA. Nevertheless, EPMS has more concerns about the project than those strictly related to Summit EIA review.
43. EPMS will present a panel of approximately five witnesses from the community who will discuss the community's concerns about the Project. The list of witnesses is unavailable at this time. All witnesses will communicate in the English language. We will endeavour to provide the Panel and other interveners with a list of witnesses as soon as possible.
44. EPMS is concerned about the following issues with respect to the proposed pipeline: socio-economic effects on Aboriginal people; impacts on both asserted and proven Aboriginal rights; impacts on traditional land use, cultural well-being, and heritage resources; consultation practices; and environmental impacts the effects of the construction, operation, and abandonment of the proposed pipeline on water, soils, terrain, vegetation, fish, wildlife, and wildlife habitat. EPMS is also concerned about pipeline safety. Finally, this list should not be construed as exhaustive, and EPMS reserves the right to add or delete issues as necessary.
45. EPMS does not plan to present a panel of expert witnesses, although it reserves the right to present such a panel. We will inform the Panel and other interveners as soon as possible if EPMS chooses to present expert witnesses.
46. Mr. W.L. McElhanney and Mr. W. S. Randall II, both of Ackroyd LLP, will represent the EPMS in this process. Other lawyers, students-at-law, and staff will assist Mr. McElhanney as necessary to efficiently represent the Communities. Ackroyd LLP's

mailing address is 1500 - 10665 Jasper Ave NW, Edmonton, Alberta T5J 3S9. The telephone number is (780) 423-8905. The facsimile number is (780) 423-8946.

Respectfully submitted this ~~22~~ 21st day of December, 2011,

<original signed by>

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Will S. Randall II

Solicitor for East Prairie Métis Settlement

SUMMIT
ENVIRONMENTAL CONSULTANTS INC.
A Member of the Associated Engineering Group of Companies

Report

Ackroyd LLP

Northern Gateway Pipeline - Review of Vegetation, Wildlife, Aquatics on behalf of HLFN and EPMS

Project: 2011-8173

November 2011

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1 Overview

1.1 Background

Enbridge Northern Gateway Pipelines Limited (Enbridge) proposes to construct and operate two pipelines and terminals as follows:

- an oil export pipeline and associated facilities;
- a condensate import pipeline and associated facilities; and
- a tank terminal and marine terminal (the Kitimat Terminal) to be located near Kitimat, British Columbia.

The Project will involve transporting oil from Alberta near Bruderheim to the Kitimat Terminal in British Columbia (Figure 1) for shipping to world markets. The Project includes constructing, operating and decommissioning the two pipelines, associated facilities and the Kitimat Terminal.

Enbridge proposes to transport conventional light and heavy oil, synthetic oil, bitumen blended with condensate and bitumen blended with synthetic oil. The oil pipeline is designed for an average annual throughput capacity of 83,400 m^3 (525,000 barrels) per day, and will have an outside diameter (OD) of 91.4 cm. The condensate pipeline is designed with an average annual throughput capacity of 30,700 m^3 (193,000 barrels) per day and will have a 50.8 cm OD.

Figure 1. Proposed pipeline route through Alberta and British Columbia.

Enbridge is applying for approval to install the pipelines within a 1-km wide corridor that is approximately 1,172 km long. The pipeline route crosses 194 watercourses in Alberta (all are fish-bearing). Most pipeline stream crossings are in the Athabasca drainage (44%), followed by the Peace River drainage (43%). Within Alberta, pump stations are proposed for Bruderheim (KP 0), Whitecourt (KP 203.2), and Smoky River (KP 400.6).

A component of the regulatory requirements for Enbridge was to complete an Environmental Impact Assessment (EIA). Canada's risk framework includes key principles relevant to the environmental assessment process, including sound science and follow-up with monitoring activities a key element where there is uncertainty. Enbridge summarizes their environmental methodology in Volume 1, Section 6.3.2; the scope of their assessment in Section 6.3.3; their

approach to determining cumulative effects in Section 6.3.4, and their mitigation and monitoring programs in Section 6.3.5/6.

While there are potential environmental concerns related to the construction phase of the project, a key concern for many stakeholders is the potential for accidents and malfunctions. An entire volume (7B) was dedicated to *Risk Assessment and Management of Spills – Pipelines*. This concern is among those reflected in review comments within the three component reviews of this report.

1.2 Scope of Review

Summit was retained by Ackroyd LLP to complete technical and scientific reviews on behalf of **Horse Lake First Nation** (HLFN) and **East Prairie Métis Settlement** (EPMS). HLFN communities are located north/northwest of Grande Prairie, and EPMS is located southeast of High Prairie. We understand their traditional territories extend to the proposed pipeline route between KP 200 to KP 500, which was the focus of our reviews.

The following environmental components are the subject of the reviews set out in Sections 2, 3, and 4 of this report:

- Vegetation,
- Wildlife, and
- Aquatic resources (including water quality, fish and fish habitat).

Information about the above environmental components was contained in various volumes found on the Project regulatory applications website (www.northerngateway.ca). While the review team made every effort to comprehensively review all of the documentation, it should be noted that the reports were extensive and lengthy. The scope of the reviews was somewhat limited by budget constraints; however, we believe we have reviewed the documentation in a professional and scientifically thorough manner. The following reports were considered in our reviews:

- Volume 1 – Overview and general information;
- Volume 6A (Parts 1 and 2) – Environmental and Socio-Economic Assessment (EA and SEA) – Pipelines and Tank Terminal;
- Volume 7A – Construction Environmental Protection and Management Plan; and
- Volume 7B – Risk Assessment and Management of Spills – Pipelines.

Each component review is organized into sections that describe the potential general impacts of the project (including the activity that causes the impact), an overview as to whether the assessment was sufficient, and itemized key concerns and recommendations. The concerns and

recommendations provide valuable information that the communities may use to decide whether to request Enbridge or regulators to take further action.

2 Vegetation Component Review

2.1 Vegetation Impacts

The communities of Horse Lake First Nation and the East Prairie Metis Settlement are within the Southern Alberta Uplands (SAU) physiographic region. The SAU region, which is crossed by 350 km of the proposed pipeline route (Green Court, Alberta to the Alberta-British Columbia border), represents 29% of the total project study area.

Vegetation communities within the SAU region include mixed forests of white spruce, black spruce, lodgepole pine, aspen, paper birch and balsam poplar within upland areas. Lowland areas characteristically contain scattered black spruce, tamarack, and graminoid dominated wetlands. Old growth forests occupy 9% and wetlands occupy 7% of the region. Out of all the physiographic regions impacted by the project, the SAU has the largest extent (4,576 ha) of wetland and riparian ecosystems. Twenty-four rare plant species were identified, no rare ecological communities were identified, sixteen regulated weeds were observed, and merchantable timber is estimated at 338,000 m^2.

In addition, the SAU region is characterized by gently sloping terrain incised by major watercourse valleys such as the Athabasca, Little Smoky, Waskahigan, Simonette, Latirnell, Sakwataman, Smoky, Wapiti, and Redwillow Rivers. The proposed project will cross all of these major watercourses.

Potential Impacts Summary

Many issues concerning potential impacts on vegetation from project construction were raised. The overarching concern is a decrease in vegetation diversity. Key indicators were developed to help assess potential impacts from the project on vegetation diversity. The key indicators are: ecosite phase, old growth forest, rare ecological communities, wetlands, and timber resources. Impacts to each key indicator were assessed using one or more measurable parameters, such as the area impacted within an ecosystem, or number of species.

Overall, approximately 2,380 ha of the native vegetation will be cleared; this represents 6% of the Project Effects Assessment Area (**PEAA**, 1 km wide right-of-way (RoW) along the proposed pipeline alignment). Total hectares within the PEAA for the SAU region is 34,412 ha. A summary of vegetation coverage within the SAU region project area is shown in Table 1.

Table 1. Key Indicator Areas within the SAU Region

Key Indicator/Vegetation Unit	Hectares* within the PEAA	Percentage of total within the PEAA
Ecosite phase	27,850	81%
Old growth forest	2,999	9%
Rare communities	0	0%
Wetlands	4,372	13%
Disturbed area	1,226	4%

*Note some areas overlap, thus total ha in this table equals more than 100% of the total PEAA area.

Enbridge described the residual effects on vegetation diversity from the proposed project as 'not significant'. Each key indicator was assessed and impacts were deemed as significant or not significant according to a number of factors, one of them being a threshold, usually an area percentage compared to the total area of that indicator within the PEAA (i.e., if 10% or more of the area is affected impacts would be deemed 'significant'). Residual environmental effects from the project were deemed as 'not significant' for all the key indicators within the SAU region. Table 2 summarizes key indicators and their projected residual effects from this project.

Table 2. Residual Effects on Vegetation Diversity within the SAU Region

Key Indicator/Vegetation Unit	Hectares* directly impacted within the PEAA	Percentage impacted	Significance
Ecosite phases	1,982	6%	Not significant
Old growth forest	172	5%	Not significant
Rare communities	0 (No communities present, but 5 individual rare species were recorded)	0%	Not significant
Wetlands	226	5%	Not significant

Spills Impacts

Impacts from spills on vegetation were analyzed by compiling data from past spills. Impacts to vegetation from oil spills include: smothering, short-term modification of their habitat by altering soil chemistry, inhibition of seed germination, growth inhibition, mortality, and long-term habitat modification. Long-term effects to vegetation and a vegetative community depends on the size of the spill and the habitat where the spill occurs.

Proposed Construction Mitigation

A Vegetation Protection and Management Plan has been developed by Enbridge. The plan includes developing 'environmental alignment sheets' for each local area with re-vegetation specifications and mitigation measures. Local aboriginal knowledge will be considered when assessing which vegetation features require mitigation measures. Revegetation specifications include seeding, incorporation of cultural species into the revegetation plans, and native species planting. A specific plan for rare plants and sensitive ecosystems will be developed on a case-by-case basis and will rely on Aboriginal Traditional Knowledge (ATK) studies and consultation.

Timber harvesting will occur prior to site preparation and aboriginal groups will be given the opportunity to harvest areas within the RoW before the construction.

Spills Mitigation

Planned mitigation measures include removal of contaminated soil and vegetation to an approved waste treatment facility, identification of rare plants and communities and protection to limit vegetation disturbance during clean-up. In wetlands, heavily impacted vegetation will be cut at the water or peat level to allow regeneration, or only affected branches will be pruned to speed recovery. In river systems, low growing plants that were exposed to contaminated water will be removed and again, affected branches of larger plants will be pruned to allow maximum potential regeneration of the site.

A follow-up monitoring program would be developed by the emergency response team and stakeholders and could include surveys of native vegetation species composition, plant health and abundance, invasive weeds, rare plants, and soil and water quality testing.

2.2 Vegetation Assessment

Overall, the vegetation portion of the assessment was thorough and sufficient. One key indicator that should have been classified and included within all components of the assessment is *riparian vegetation* (see recommendation below). Throughout the entire assessment document, riparian vegetation is mentioned but the spatial extent in the area is not quantified. Since the SAU region has the highest number of wetlands and rivers out of all the regions, we would recommend they include riparian vegetation in their Residual Effects Assessment to determine whether the potential effects of the proposed project are significant.

Follow-up monitoring programs have been proposed for many different aspects of the project; however, it is unclear who will be responsible for monitoring program design and implementation, what will be the duration of the monitoring program, and what are the monitoring program objectives.

2.3 Vegetation Key Concerns and Recommendations

2.3.1 Residual Impacts

Volume 6A Part 1, Section 8.4.3.4, pg. 8-808, Table 8-54
Project impacts to rare plants-deemed as not significant, wetlands-deemed as not significant, no assessment for residual impacts on riparian vegetation

[1] Recommendation: Enbridge should clarify (i) why impacts to rare plants and wetlands are deemed as 'reversible' and 'not significant' when impacts to these communities should be considered as 'non-reversible' because they are not able to restore these communities after project decommissioning; (ii) and include the analysis of residual effects on riparian vegetation specifically.

2.3.2 Rare Plants and Rare Ecological Communities

Volume 6A Part 1, Section 8.4.2.1, page 8-26
Data sources and fieldwork for this project were completed between 2000 and 2009. Research states that no rare ecological communities were identified for this region; however, provincial rare plant and rare ecological community data searches used data from 2000-2007. Additional species and commuities have been added to the rare tracking lists in 2011.

[2] Recommendation: HLFN and EPMS may wish to request (i) that Enbridge update their rare and endangered species background and data searches to reflect any recent plant inclusions in the Alberta National Heritage Information Centre (ANHIC) / Alberta Conservation Information Management System (ACIMS) tracking list; (ii) a background and data search of Enbridge's survey data to reflect the updated rare and endangered ecological plant community ACIMS tracking list (updated in April 2011); and (iii) that Enbridge notify HLFN and EPMS if there are any additions, and adjust their reports accordingly (as rare communities are a key indicator in the Residual Effects Impact analysis).

2.3.3 Monitoring Programs and Plans

Volume 6A Part 1, Volume 7A, Volume 7B
Enbridge provides no timelines for monitoring programs, abundant promises, and no clear commitments. Examples: (6A pg. 8-120), enhanced reclamation plan (7A 8-23), revegetation programs, and no mention of success and survival monitoring (7A A-146).

[3] Recommendation: HLFN and EPMS may wish to request (i) a summary table of all monitoring programs proposed by the project, when they will occur (what stage within the

project), who will be responsible, who will design and implement, what the duration of the monitoring program will be, and who will complete the work; and (ii) the inclusion of a success and survival monitoring program standards specific to vegetation.

2.3.4 RoW Planning and Access

Volume 7A, a-46, A.3.2
RoW planning will only incorporate feedback from local Aboriginal groups if they request it. The RoW Access Management Plan should include invasive plant species management, and state who is responsible.

[4] Recommendation: HLFN and EPMS may wish to request (i) to be involved in RoW planning; (ii) to be involved in the development of the Access Management Plan for the SAU region specifically; and to obtain clarification as to who is responsible for the long-term management and enforcement of the Access Management Plan.

2.3.5 Vegetation Protection Plan-Rare Species

Volume 7A, Section A.3.24, pg. A-121
Rare plant protection measures may not be sufficient in some cases, the report states that a contractor may be responsible for taking care of a transplanted species, this situation is not ideal and carries a high level of risk.

[5] Recommendation: HLFN and EPMS may wish to request to be involved (i) in the protection plan of rare species within the SAU region and (ii) in determining who will be responsible for the continued protection of the species. For the plan and implementation to be successful, it may be appropriate to involve research or professional organizations.

2.3.6 Weed Management Plan

Volume 7A, Section A.3.34, pg. A-159
There is a high risk of increased weed spread along the RoW; therefore, weed surveys should be completed and included within the environmental alignment sheets. The surveys should identify areas of concern for spread, highly infested areas, species present, target species, and should be designed to facilitate management planning. Local traditional users should be involved in the surveys and monitoring programs.

[6] Recommendation: Enbridge should clarify (i) whether any invasive weed surveys have been completed to date, (ii) how Aboriginal groups will be involved in the surveys and how areas of concern for their communities will be addressed; and (iii) if monitoring programs for weed spread are included in the project.

2.3.7 Spills: Protection of Environmentally Sensitive Areas (ESAs)

Volume 7B, Section 5.4, 5.6, Table 5-2
Aboriginal group input and completion of ATK studies within their region are needed to satisfy all aspects of the proposed plan to protect ESA's. If an ATK study is not complete, ESA's may not be adequately identified. The report states that 'ESA priorities can be assessed, as part of local, site-specific planning strategies…'.

[7] Recommendation: HLFN and EPMS may wish to request (i) that priorities will be assessed locally, and (ii) the completion of the ATK studies.

2.3.8 Follow-up monitoring and habitat remediation after a spill

Volume 7B, Section 8.6.4, pg. 7-13
Follow-up monitoring is included after a spill but there is no mention of planning, remediation, or habitat restoration after a spill.

[8] Recommendation: HLFN and EPMS may wish to request (i) details about follow-up monitoring and the duration of the proposed monitoring; (ii) provisions for habitat restoration after a spill including studies to assess the success of the restoration and spill clean-up; and (iii) the involvement of Aboriginal groups in this process.

2.3.9 Aboriginal Traditional Knowledge (ATK) use during a spill event

Volume 7B, Section 8.3, pg. 8-5
It is essential that ATK studies be completed to help identify those areas/issues that are important to Aboriginal groups in the event of a spill.

[9] Recommendation: HLFN and EPMS may wish to request (i) to engage and complete the ATK studies (ii) that follow-up monitoring state that Aboriginal groups will be engaged with the clean-up, remediation and compensation and mitigation of a spill, instead of should be engaged.

3 Wildlife Component Review

3.1 Wildlife Impacts

The Boreal Taiga Plains in this region of Alberta has a high percentage of species (birds in particular), although Enbridge provides minimal population data. Habitat degradation is increasing due to continued high levels of oil/gas exploration resulting in forest fragmentation and increased public access. In general (inclusive of this assessment, but not limited to it), there is existing habitat loss that is not quantified in the reports, potential impacts are not thoroughly assessed and baseline data is lacking.

The assessment of the degree or significance of impact appears arbitrary rather than based on survey data. For example:

- Volume 6A, Section 9.5.2, pgs. 9-69-70: amount of key nesting habitat is rare within the assessment area, and more is being removed/impacted by the project, yet the impact is considered nominal.
- Volume 6A, Section 9.5.6 pgs. 9-75-77: [northern goshawk] nests in large (>100 ha) stands and avoids edges – habitat fragmentation is detrimental to this species. Yet, overall impacts (inclusive of cumulative impacts) are assessed as negligible.

Specific to this assessment, there is no indication if long-term monitoring of terrestrial landscapes and animals is planned or if there is any commitment to monitoring population data or wildlife movement patterns/behaviours in relation to the presence of the pipeline. Overall, Enbridge should identify impacts of the cumulative loss of habitat as it relates to the lifespan of the pipeline, from initial construction to complete decommissioning, when the landscape is fully reclaimed.

Based on our review of the report, the overall assessment that the pipeline will not have a significant impact on wildlife is not sufficiently substantiated.

3.2 Wildlife Assessment

As stated above, there is insufficient information to conclude minimal impacts based on the intensity and timing of the studies conducted, and the inappropriateness of the indicator species selected. Overall, the surveys showed a low level of localized effort (not enough survey days), and in some cases, inappropriate techniques or survey timing. Data gathered through the use of invasive species, migratory species or those occurring within a small section of the RoW as indicator species cannot be used to assess overall impacts.

For example, Volume 6A, Section 9.5.5 – Great Blue Heron – This species has two subspecies, one of which doesn't occur anywhere within the study area, and if it is observed, it is considered a "wanderer". The other subspecies only occurs in sections of the RoW in British Columbia, and not

in Alberta at all. Because of the range constraints of this species and the likelihood of encountering individuals or colonies is low, it is not possible to determine the magnitude of impacts on the species in the entire project.

As another example, Volume 6A, Section 9.5.9 – Western Screech owl – only occurs in a small fraction of the RoW, and has a specific ecological niche not available in the rest of the area, therefore, this species is not appropriate as a key indicator (KI) species. Without sufficient baseline data, cumulative impacts cannot be determined properly. The impacts to wildlife, or lack thereof, would be better defended with a map outlining all developments, pipeline and seismic lines, roads and other anthropogenic influences and the various key indicator territories or habitats.

3.3 Wildlife Key Concerns and Recommendations

3.3.1 Wildlife Issues Raised during Construction

Volume 6A, Part 2, Section 9.2.1.1 (pg. 9-17 – 9-19)

- *Effects of herbicides on wildlife and whether, as a result, wildlife is a safe source of food for human consumption*
- *Toxic waste management and potential effects on wildlife health, specifically ungulate health*

No further information on these potential effects is discussed in the impact sections of the report. Herbicide effects are often more detrimental through chronic and long-term exposure at lower concentrations than acute, short-term exposures at high concentrations. There is wording around using mechanical treatment of invasive species if possible, but no mention of mitigation measures against preventing ingestion of toxicants or transfer through the food web from the RoW.

[1] Recommendation: Enbridge should clarify how invasive plant species will be controlled within the RoW and disturbance areas. If herbicides are necessary to control invasive species, Enbridge should explain their mitigation measures to prevent contamination of waterways and vegetation, trophic interactions and the effects of persistence in the aquatic and terrestrial environments.

- *Mitigation measures for project effects measures include replanting with species that provide good browse for ungulates (e.g., red-clover, alfalfa mix, and grasses)*

In the mitigation section for reclamation, Enbridge states that the revegetation species established will be native but the examples provided are agronomic species. While agronomics typically provide good initial erosion control and are often palatable to ungulates, they are frequently more competitive than native grasses and forbs and not indigenous to the area.

[2] Recommendation: (i) HLFN and EPMS may wish to suggest that native seeds and other plants used to restore sites be sourced from local suppliers or salvaged from the local RoW to ensure greater success in revegetation; and (ii) if this information is already provided in other volumes of the report, please provide reference to where the information can be found.

3.3.2 Groups for Key Indicator Species

Volume 6A, Part 2, Section 9.2.2.2 (pg. 9-19 – 9-25)

- *Forest-dependent species: … barred owl, western screech owl, short-eared owl…*

Indicator species are chosen based on their broad ecological niche requirements, occurrences in all habitat types, or majority of habitat types within a project area. Indicator species must be chosen based on being resident, endemic and widespread throughout an area. The barred owl is an invasive species whose range is currently expanding and is generally not known for western North America. Further, their current range is not known to occur in high elevations (e.g., sub-alpine, alpine, etc.), and therefore, would not occur in much of the RoW. Western screech owl (*kennicottii* subspecies) is only found on the coast of British Columbia and absent elsewhere. Having a species as an indicator species whose habitat is represented by less than 10% of the entire project area is misrepresentative of the potential impacts. Short-eared owl is a migrant species, and therefore the assessment would only consider impacts to seasonal habitats, which is not the "umbrella-species" approach that is required by selecting an indicator species.

[3] Recommendation: Enbridge may wish to reconsider their key indicator species list to be more relevant to ranges in Alberta. Suggested species include pileated woodpecker, three-toed woodpecker, great horned owl, great grey owl, or hawk owl.

For amphibians, species are grouped based on similarities in general habitat use, as follows:

- *Pond-dwelling amphibians: species such as Canadian toad, western toad and northern leopard frog; and*
- *Stream-dwelling amphibians: coastal tailed frog.*

As with the bird species discussed above, indicator species should be ultimately chosen based on their appropriateness to the project to adequately determine potential impacts and their severity. Coastal tailed frogs are highly specific in their habitat requirements and their range represents a small percentage of the entire project area. Therefore, the potential impacts to streams and other frog habitat cannot be extrapolated to quantify potential impacts to streams in the remaining project area. Northern leopard frog is mentioned as a species considered to be used as an indicator species, but it does not

occur anywhere within the RoW or in any adjacent habitats. The limited known range of this species makes it an inappropriate candidate for assessment.

Further, pond-breeding amphibians in the northern ecosystems use terrestrial habitats for over-wintering. While consideration for protection of the amphibians and their breeding habitats is provided for construction (i.e., occurring outside breeding window), no consideration is given to the impacts of construction during fall and spring, when the animals are hibernating on the forest floor, thus direct mortality is likely. Boreal chorus frog, Pacific chorus frog, and western toad all hibernate in forest ecosystems under loose bark or leaf litter on the forest floor.

One of the most wide-spread amphibians for the RoW is western toad, which is known to occur both in slow moving streams as well as in ponds and lakes in both British Columbia and Alberta. As a federally listed species with a wide range in habitat requirements (i.e., occurring from bunchgrass grassland to subalpine ecosystems), this is a suitable umbrella or indicator species.

[4] Recommendation: Enbridge should (i) consider using Columbian spotted frog, long-toed salamander and western toad as indicator species, and remove all reference to northern leopard frog; and (ii) assess amphibian habitat in detail for habitat suitability for the above-recommended species throughout the RoW and describing potential impacts to both summer and winter habitats.

3.3.3 General Mitigation Measures for Wildlife

Volume 6A, Part 2, Section 9.3 (pg. 9-39 – 9-45)

- *Table 9.10 Mitigation Measures for Wildlife*
  No. 4 – Access Management: Prohibit project personnel from the recreational use of temporary access roads and the RoW.

There is no mention of how to limit non-project personnel access and the potential impacts that increased hunting pressures will have on large game via the RoW. Only post-construction access is mentioned. Large game species tend to be attracted to RoWs because of browsing opportunities and good sight-lines. Continuous use by ATV/snowmobile etc. and continuous browsing will maintain the RoW as an open, accessible corridor facilitating hunter access well beyond the lifespan of the pipeline.

[5] Recommendation: Enbridge should (i) consider the “short-term” increased hunting pressures from RoW construction, operation, and decommissioning, given that access to the remote areas will likely remain well after the site is considered “decommissioned”; and (ii) identify how they will help HLFN and EPMS community members to maintain access to their traditional hunting areas that intersect with the RoW.

…No. 11 – Habitat: Re-vegetate temporary workspaces with native species…

It is unclear from the document where the native plants will be sourced. Access into remote areas is limited, and sourcing native plants that are started in similar geographic areas is difficult without an intensive acclimation period.

[6] Recommendation: Plants from the RoW should be salvaged where possible and replanted to ensure a higher success in re-establishment.

…No. 26 – Amphibians: Maintain a year-round setback for wetlands…used by Canadian toads…

Only Canadian toads are mentioned for direct conservation measures. Will no conservation measures be implemented for other species? Not all of the ponds within the RoW were surveyed for amphibian presence or species/abundance. Will surveys be conducted prior to construction activities? The lack of detailed information is insufficient to claim the project will have only minor impacts to wildlife.

[7] Recommendation: Enbridge should provide further detail on the intensity of assessment and mitigation measures to support their conclusion of "minor impacts" to wildlife.

...No. 29 – Amphibians, pond dwelling: Use culverts to avoid creating artificial breeding ponds near active access roads to reduce road mortality of dispersing juveniles.

Culverts will function to limit standing water; however, as movement corridors, these will be generally avoided because amphibians will seek out any residual heat generated from the road materials (and will therefore preferentially use the roadways).

[8] Recommendation: In areas where the access roads interrupt movement between breeding grounds and suitable wintering grounds, consider "day-lighting"[1] to remove the temptation to use the roads by frogs.

…No. 31/32 – Birds, breeding: clear natural vegetation outside breeding season… implement setbacks around nests…

Does a Construction Environmental Management Plan provide specific requirements for pre-clearing nest surveys completed by a QEP expert nest searcher? How and when will these surveys be completed?

[1] Frogs will opt to use light, warm and dry surfaces to travel, rather than dark, cool and moist culverts. "Day-lighting" refers to shortening the length of closed habitat so that the passage way is more appealing to be used as a movement corridor, opening the stream or choosing a divided road design with an open-air stream in the middle, rather than twinning large rights-of-ways, etc. This can be achieved through different culvert designs rather than the conventional round culvert, and in areas where the road bisects a wetland, route the wetland/stream under the road through the use of a cattle guard rather than a conventional culvert.

[9] Recommendation: For the reviewers to have confidence the assessment has been completed sufficiently to determine minor impacts nesting birds, further detail on the nest survey plans is required.

…No. 36-38 – Mammals…: avoid clearing areas with high potential for fisher natal dens…develop and implement protocols for avoiding and managing bear-human conflicts…avoid sensory disturbance of key grizzly bear habitat…

The methodology of determining denning sites is lacking. For example, have any bears been collared to determine denning sites? Have any fishers been collared and tracked to determine natal dens? How was key denning habitat identified? Will there be surveys specifically for these sites prior to winter vegetation clearing that will disturb hibernating animals?

[10] Recommendation: Enbridge should provide detailed information about how they plan to avoid denning sites. If this information is not yet available, then indicate when the information would be gathered and discuss how this information could affect the conclusion of minimal impacts.

*…No. 44 – Mammals, **woodland caribou**: Avoid disturbance of identified key woodland caribou habitat during critical restricted activity periods…*

The methodology of determining impacts to the various life stages of woodland caribou is lacking. Are there protection measures for any other periods, such as breeding, migration, and summer foraging? If caribou occur within the RoW during clearing/construction, are there mitigation measures in place to effectively and without major disturbance, move the animals out of the path of construction?

[11] Recommendation: Enbridge should include sufficient information to answer the above questions in detail. If this information is not yet available, please provide an answer as to why and when the information will be collected in order to properly assess the impacts of the project.

3.3.4 Assessment Methods for Wildlife

Volume 6A, Part 2, Section 9.4.1.1 (pg. 9-46 – 9-19)

- *…No. 48 – Snakes and lizards: Implement year-round sensory disturbance buffers for herpetile hibernacula that are at least 30-m wide in BC…*

  Thirty metres (30 m) is the minimum Best Management Practice for temporary disturbance; however, because snakes have ranges of 500 m up to 8,000 m (species- and geography-dependent), consideration and mitigation must be provided to the disruption of their movement/migration/feeding habitats. The most likely snake within the project area is the western terrestrial garter snake (*Thamnopsis elegans vagrans*), and while not listed, is at the most northerly extent of its range. Species at the edges of ranges often have

adaptations that allow them to live there, making them more significant to the survivorship of the species as a whole. How is Enbridge going to mitigate against direct/indirect mortality and disturbance, as the stated buffer is not sufficient?

[12] Recommendation: Enbridge should provide information to address impacts to western terrestrial garter snakes, and provide further detail on the impacts to the species and other reptiles that are at the northern extent of their ranges. If this information is already provided in other volumes of the report, Enbridge should make reference to where the information can be found so that potential impacts may be more effectively reviewed.

3.3.5 Ungulates: Caribou and Mountain Goats – Blasting Impacts

Volume 6A, Part 2, Section 9.4.1.3

In the construction mitigation plans, is there a mitigation strategy to reduce or eliminate the impacts of blasting? In areas of highway construction in caribou or goat habitat and kidding grounds, *detonation-cord* explosives are known as an effective and less disruptive method. Has Enbridge committed to this level of mitigation, and if not, when will that commitment be in place?

[13] Recommendation: Enbridge should more clearly address the impacts of blasting on ungulates including caribou and mountain goats, and if the information is available in documentation provided, cross reference to where the information can be found, as appropriate.

3.3.6 Coastal Tailed Frog

Section 9.4.1.9

- *…the species is found only in Coastal Western Hemlock and Mountain Hemlock zones on the north coast of British Columbia…*

Enbridge has not made it clear why coastal tailed frog is singled out as the only amphibian species for habitat suitability mapping when such a small portion of their habitat is represented within the project area. The impact to this specific species will be negligible because of the minimal amount of habitat within the RoW. However, applying this blanket conclusion that impacts to all amphibians will be minimal is inappropriate.

[14] Recommendation: Enbridge should consider using western toad and Canadian toad as the umbrella/indicator species for potential impacts to amphibians and their habitats. These two species are some of the most common within the RoW, and therefore, impacts to these species can be applied to other amphibian species that are only found within small portions of the RoW. If there are potential impacts specific to tailed frog, then it would be preferable to mention those in the context of the extent of the project within the range of

tailed frog, rather than as a statement for amphibians broadly applicable throughout the project RoW.

3.3.7 Pond-dwelling Amphibians

Volume 6A, Section 9.4.1.10 (pg. 9-52)

- *A quantitative habitat availability analysis was not completed…. All ponds within the PEAA are assumed to provide habitat…*

  Breeding habitat requirements for many northern species is highly specific, and not all ponds have equal habitat suitability. Applying a broad statement of minimal impact to amphibians and their breeding habitats without specific assessment is not justified.

  [15] Recommendation: Enbridge should provide a detailed assessment of the overwintering habitats around amphibian ponds, breeding potential, and feeding potential. Further, hydrological assessments and water quality assessments prior to construction and compared with RoW design should be completed to properly determine impacts.

3.3.8 Effects on Wildlife due to Change in Mortality Risk

Volume 6A, Section 9.4.3. (pg. 9-57 – 9-59)

This section addresses some effects that are possible, but evidence that these potential impacts can or will be mitigated is not clearly addressed.

The lack of impact throughout this section cannot be accurately concluded due to a lack of long-term data. Cumulative effects and the full scope (route) of the project and its infrastructure are currently unknown.

Measurable parameters for all species are possible with sufficient baseline data. With respect to amphibians, mortality risk includes direct mortality from vehicles on access roads, and contamination of wetlands and ponds from road runoff, spills, and accidents. As well, changes in hydrology that result in pond drying or flooding may reduce or, render ineffective, breeding and rearing habitat.

[16] Recommendation: This section would benefit from a reference to the mitigation section(s) where the impacts are considered, to further illustrate that potential impacts on wildlife are minimal.

Further, baseline data collection over several years at select indicator sites within the RoW, (comparing control sites and test sites) will provide information suitable for determining comprehensive potential impacts to amphibians. If further studies are planned prior to project construction, Enbridge should itemize these studies for the benefit of stakeholders and, if deemed unnecessary, Enbridge should provide justification.

3.3.9 Insufficient Field Surveys

Volume 6A, Section 9.4.5

Generally, field surveys did not result in sufficient data to evaluate the assumptions, correlations and conclusions that are being presented.

Many bird species only received one year of survey effort. Migratory bird and raptor populations fluctuate yearly, as do their use of stop-over sites. These changes can be based on prey availability, yearly seasonal differences, changes in landscape in both winter and summer staging grounds, etc. Further, raptors in particular are easily influenced by prey abundance and seasonal fluctuations, seeing significant changes in observed populations/presence from year to year.

Some species were not surveyed in the appropriate timing window. For example, goshawks were surveyed in April and July of the same year. Nest surveys should be completed at the end of the snow season, and surveys for active nests should occur in early spring when the adults are more responsive. If surveys are completed when young have fledged, adults are unresponsive and not defending their territories.

Mammals were surveyed in two non-sequential years, with no evidence of replication. Data cannot be correlated, and no impact conclusions can be drawn. Ranges, den sites etc. cannot be accurately determined without mark-recapture surveys over a minimum of 3-5 years.

Amphibian surveys must include live-trapping, auditory surveys in addition to dip-netting and active searches. Because of the timing windows of breeding/hatching/metamorphosis, the passive surveys completed in a single year are not sufficient to determine presence/absence or population demographics.

[17] Recommendation: Enbridge should provide further details of their annual bird and wildlife surveys completed in western Alberta (KP 200-500) so that we may more accurately review the conclusion of minimal impacts in this region.

3.3.10 Inappropriate Key Indicator Species

Volume 6A, Section 9.5.9 (pgs. 9-80 – 9-81)

Western screech owls are found in a small fraction of the RoW and are not appropriate to use as a key indicator species.

[18] Recommendation: Enbridge should address impacts to more generalist species, readily occurring within the RoW and complete more detailed research on current population trends.

Volume 6A, Section 9.5.10

Barred owl is an invasive species, and its range is currently expanding and poorly understood. Highly predatory and competitive, this species is not appropriate to be used as a KI.

[19] Recommendation: Enbridge should reconsider the use of the invasive species, barred owl, and replace it with other native, readily occurring owl species.

3.3.11 Grizzly Bear Dens

Volume 6A, Section 9.5.26 (pgs. 9-108 – 9-112)

- *Grizzlies are sensitive to land management practices… factors that have contributed to the decline in grizzly bears throughout their range include increased road access and human-caused mortality, as well as habitat loss and fragmentation.*

Given the bear's sensitivity to disturbance, and that no den searches with radio collared bears has been conducted, or if data is available, not cross-referenced within this report, is Enbridge able to defend that there will be no impacts to bears in the area? Will there be monitoring protocols in place during construction and operation to determine if the potential for effects is realized?

[20] Recommendation: Enbridge should (i) work with regional biologists to determine existing den locations, locate radio-collared bears for tracking during hibernation season within the RoW and a zone of influence (where impacts are likely, even if it's simply changes in behavior or foraging patterns); and (ii) work with local aboriginal groups to gather traditional knowledge on current bear movement patterns and correlate with RoW and other factors already fragmenting existing habitat.

3.3.12 Effects on Wildlife due to Change in Habitat Availability

Volume 6A, Part 2, Sections 9.6 and 9.2.1.1

Operations

…habitat loss…

…sensory disturbance…

Decommissioning

…pipes will be abandoned in place

Pipeline crossings will not be removed

…RoW will be reclaimed to a natural vegetation community…

A risk assessment appears to have been completed for marine mammals, but not for caribou or other wildlife species. Long-term monitoring plans for the decommissioned infrastructure to ensure no long-term impacts on the vegetation or wildlife occurs is lacking.

Do the current mitigation measures have the flexibility to change based on future political regulations/requirements?

In Volume 6A, Part 2, Section 9.2.1.1 **(pg. 9-17 – 9-19)**, Enbridge states that the area will be restored with a planting plan, but here, it states that the RoW will naturally re-vegetate. Will the potential for long-term soil contamination, leading to contaminated vegetation and long-term impacts to browsing/grazing animals be monitored as the decommissioned pipe ages?

[21] Recommendation: Enbridge should provide justification as to when passive versus active revegetation interventions will be applied. If the information is provided and available in another volume, please make reference as to where the information can be found, and summarize in the appropriate sections.

3.3.13 Conservation of Migratory Bird Habitat

Volume 6A, Section 9.6.1.2 (pgs. 9-121 – 123)

A threat to migratory birds is the loss of staging and feeding areas along their migration route. The proposed route appears to span migratory bird Conservation Areas #4, 6 and 10, bisecting the Pacific flyway as well as the interior flyway. Thus, data regarding stop-over sites, staging and seasonal habitats is likely readily available but not included in this report.

Further, with this information, cumulative impacts and long-term effects can be more adequately assessed. Currently, there is little indication if any operational monitoring of wildlife populations will be completed.

[22] Recommendation: Enbridge should commit to examining the recommendations of *Partners in Flight-Canada* (Environment Canada), which provides the following recommendations for conservation area #6 (Boreal Taiga Plains):

Monitoring Needs:

- Habitat-based monitoring programs for conifer, mixed-wood, marsh and riparian habitats;
- Species-based monitoring programs for owls, diurnal raptors and woodpeckers;
- Productivity monitoring programs; and

- Habitat-based inventories of land-birds.

Research Needs:

- Effects of oil/gas exploration, particularly fragmentation, habitat degradation, and increased access on species composition and productivity;
- Landscape-level analysis of cumulative effects of land use on species composition and productivity;

In order to adequately determine the acute, long-term and cumulative impacts on migratory birds caused by the pipeline, further studies are required, as is the commitment to a long-term monitoring plan (operation and decommissioning of the pipeline), particularly considering the potential for the impact of **spills and leaks**.

3.3.14 Mammals attracted to RoWs

Volume 6A, Section 9.6.1.3 (pgs. 9-123 – 124)

Attracting mammals to the RoW enables predation and access for hunting regardless of the quality of forage. If no active restoration is planned, regular use and access by humans, as well as continuous browsing by ungulates, will enable access to persist beyond the "decommissioning" phase of the project. Will access ultimately be disabled or will access be allowed for long-term monitoring of decommissioned pipeline?

[23] Recommendation: If information about predation and hunting pressure is already available, Enbridge should cross reference its location within the report, and summarize the information in this section. If this information is not already available, please address the questions about the impacts on mammal populations during the decommissioning stage with particular reference to KP 200 – KP 500.

3.3.15 Amphibians

Volume 6A, Section 9.6.1.4

Construction

Many northern amphibians hibernate on the forest floor, where direct mortality from construction is possible. Are there mitigation measures in place to protect amphibians?

Operations

It is assumed that amphibian habitat will likely be created in low areas along the pipeline. Have empirically-based hydrological studies or modeling been carried out to determine this likelihood of lowland creation, or are there designated areas where these landscape features will occur or will be encouraged?

Decommissioning

Post-closure site conditions are anticipated to be drier than baseline conditions. Have any hydrology studies or modeling specific to standing water habitats suitable for amphibians been carried out? Enbridge's definition of "minor permanent habitat loss" as it relates to the decommissioning of the RoW is unclear. If unknown, provide mitigation solutions, as the following section (**Section 9.6.2**) indicates that wetlands will be protected; however, this appears to contradict the previous sections on amphibians.

[24] Recommendation: Enbridge should address the questions above about the impacts of all stages of the project on amphibians. If the information is already available elsewhere in the report, cross-reference as to where the information can be found, and summarize in this section on how it pertains to amphibian habitat.

3.3.16 Mitigation and Effects Management

Volume 6A, Section 9.6.2 (pgs. 9-124 – 126)

We recognize that the Mitigation and Effects Management section is an extension of another volume; however, the level of detail would benefit from cross-references as to where further information can be found in the full report.

Mitigation measures to protect birds are vague and would be more effective with further baseline information.

- Mitigation measure stating to "avoid construction within 1,000 m of sharp-tailed grouse leks".
- Mitigation measures stated to "avoid activities near Northern Goshawk nests between February 15 and August 15". However, surveys were not completed within the appropriate time period to determine nest presence or activity. Will further appropriate surveys be completed prior to construction?
- Mitigation measures stating "for sensitive wildlife periods, identify work windows in consultation with the appropriate wildlife management agencies, provincial and federal." Is there an Operations Management Plan that addresses more specifically how this will occur?

[25] Recommendation: Enbridge should provide mitigation measures for amphibians for both summer and overwintering habitats and address protection of current hydrological conditions within amphibian habitats.

Note: If habitat information is already available, Enbridge should cross-reference the volume and section location. If this information has not been considered at this phase of the project, Enbridge should identify when the information will be gathered and made available.

3.3.17 Residual Effects (Mammals)

Volume 6A, Section 9.6.3.2 (pgs. 9-142 – 175)

Overall, consultants on behalf of Enbridge concluded that habitat effectiveness will be reduced through sensory disturbance from drilling and blasting. Are there site-specific considerations with respect to proximity of natal or hibernation dens, life stage-specific habitats (e.g., winter foraging areas, calving grounds, summer habitats, etc.) where there is the potential for a synergistic effect of reduced foraging/access potential and sensory disturbance?

Further, indirect impacts by non-project related activities do not appear to have mitigation measures for non-project personnel.

[24] Recommendation: If denning sites and other specific habitats are known, and proximity to blasting and general construction is known, this level of detail is required for there to be confidence in the assessed level of impact.

4 Aquatics Component Review (Water Quality, Fish Habitat)

4.1 Aquatic Resources Impacts

Enbridge described the project interactions between construction, operations and decommissioning activities for pipelines, powerlines, roads or pump stations, and aquatic resources in Volumes 6A, 7A and 7B. For all phases of the Project, there are activities with the potential to affect water quality, the productive capacity of fish habitat, fish survival and health, and fish migration.

Some of the key rivers that will be affected by the project between KP 200 and KP 500 are the Athabasca, Wapiti, Smoky, Little Smoky, Simonette Rivers and a number of important tributaries to these rivers. Salmonid fish that may occur in these rivers include brook trout, rainbow trout, bull trout, Arctic grayling and mountain whitefish. Other key large-bodied fish species include burbot and goldeye.

Construction along the pipeline RoW will require clearing riparian vegetation, installation of pipelines under watercourses, creation of permanent and temporary access roads (including culvert installation and bridge construction on watercourses) and infilling watercourses. Operations will involve maintenance of the pipelines, powerlines and road crossings. Activities for decommissioning are limited to removal of water crossing structures.

The project activities that could affect water quality, fish and fish habitat are:

- vegetation clearing;
- use of industrial equipment;
- excavation and grading;
- placement of material structures in water;
- use of explosives;
- water extraction (both hydrostatic testing and other uses); and
- structure removal.

The potential impacts to surface water caused by the construction, operation, and decommissioning of the project include:

- degraded water quality and impacts on aquatic biota caused by spills or leaks due to failure of the pipeline structure;
- degraded water quality caused by project-related erosion of disturbed riparian areas and streambeds;
- vibration impacts caused by blasting;
- change in timing, duration and frequency of river flows;
- impacts to spawning habitats, egg incubation and early life history stages of important fish species; and
- reduced fish populations caused by increased public access to important fisheries.

Enbridge describes the key mitigation to reduce impacts to surface water resources as limiting the number of watercourse crossings, using appropriate watercourse crossing techniques, avoiding crossings with unstable channel bed and banks, revegetating channel banks after construction to increase bank stability, managing storm water runoff at pump stations and providing adequate wastewater treatment. The company concludes that the Project will have little to no measurable environmental effect with the implementation of mitigation and best management practices.

4.2 Aquatic Resources Assessment

While the assessment was comprehensive in a general sense, there were shortcomings to the assessment within the traditional territories of HLFN and EPMS between KP 200 and KP 500. For

example, there was no description of the impacts that might be caused by pipeline rupture or excessive construction disturbance to any of the key rivers listed above. Enbridge provides some examples of catastrophic spills that have occurred but overlooked a key rupture of one of their own pipelines that impacted rivers in Michigan as recently as 2010. They were very vague about whether they would be requesting approvals to proceed with construction during Restricted Activity Periods (RAP) for fish in rivers in Alberta. Enbridge was unclear about riparian setback widths for various types of infrastructure and water crossings types. In general, setback distances could be insufficient to protect fish and fish habitat.

4.3 Aquatic Resources Key Concerns and Recommendations

4.3.1 Impact of Pipeline Leakage or Rupture

Volume 7B, Section 9.4.4, page 9-20
The overarching concern of the communities is the potential impacts that would be caused by leakage or catastrophic rupture of a pipeline containing bitumen or condensate. Enbridge is aware of this concern in that Volume 7B is dedicated to the possibility of such events. The effect of bitumen spills into watercourses or waterbodies would have immediate and long-term negative effects to aquatic biota as well as waterfowl. The nearest provided example to a watercourse in Alberta was for Crooked River (KP 718.3), a low gradient river in British Columbia, which described adverse effects to water quality, fish and fish habitat. Emergency response efforts would not prevent the short-term high acute toxicity or the long-term effects on populations of salmonid and other fish species, and the loss of fishing opportunities that would follow.

[1] Recommendation: Enbridge should (i) provide an example of the potential effects of a major spill in one of the major watercourses in western Alberta (e.g., Wapiti, Little Smoky, and Simonette), including locally-relevant aquatic species; and (ii) commit to providing negotiated compensation to the people of HLFN and EPMS should any leakage or spill of resource occur into fish-bearing waters in their territory.

4.3.2 Spill-related Emergency Response Plans (ERPs)

Volume 7B, Section 7.9, page 7-26
ERPs are not well described and are identified as “Emergency response plans and cleanup procedures would be implemented immediately to mitigate adverse effects. Monitoring would be necessary to confirm that recovery continues after cleanup.” Participating Aboriginal groups would be involved in developing a spill response plan, although it isn’t clear at which stage the plan would be developed. Some hypothetical examples of a spill in a low gradient watercourse in British Columbia and a wetland in the foothills area of

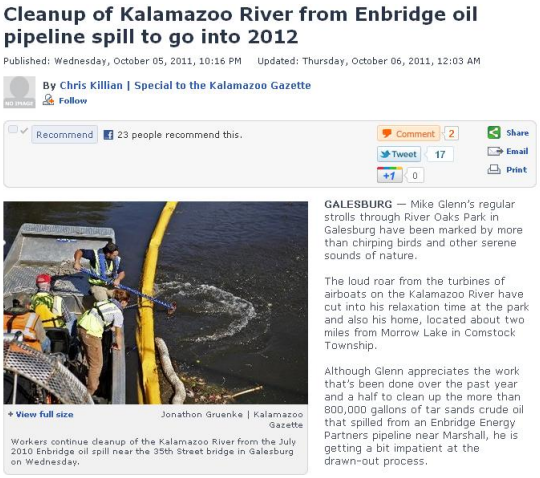
Alberta are provided (KP 234; for unknown reasons, HLFN/EPMS are not listed as a group with traditional lands at this location).

[2] Recommendation: Enbridge should (i) provide detailed emergency response plans to mitigate effects to aquatic resources/fish and fish habitat in the event of a range of system failures from pipeline leakage to catastrophic spill scenarios for example rivers in the foothills region such as the Smoky River, Wapiti River or Simonette Rivers; and (ii) Include HLFN and EPMS in the list of aboriginal communities that would be impacted by a spill in their traditional territory, and commit to including them in spill-related consultations.

4.3.3 Spill-related Residual Impacts Related to Historical Incidents

Volume 7B, Section 9.4, page 9-21

Related to the above example of a spill into a low gradient river in British Columbia, we would like an assessment of the likelihood that such an event could happen in the Foothills area of Alberta as well as an assessment of the implications based on history. For example, a major oil spill from an Enbridge pipeline project occurred in the Kalamazoo River in Michigan (http://www.epa.gov/enbridgespill/; see inset here) in 2010, yet this incident was not cited or referred to in the documented incident discussion.



Cleanup of Kalamazoo River from Enbridge oil pipeline spill to go into 2012

Published: Wednesday, October 05, 2011, 10:16 PM Updated: Thursday, October 06, 2011, 12:03 AM

By Chris Killian | Special to the Kalamazoo Gazette

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GALESBURG — Mike Glenn's regular strolls through River Oaks Park in Galesburg have been marked by more than chirping birds and other serene sounds of nature.

The loud roar from the turbines of airboats on the Kalamazoo River have cut into his relaxation time at the park and also his home, located about two miles from Morrow Lake in Comstock Township.

Although Glenn appreciates the work that's been done over the past year and a half to clean up the more than 800,000 gallons of tar sands crude oil that spilled from an Enbridge Energy Partners pipeline near Marshall, he is getting a bit impatient at the drawn-out process.

+ View full size Jonathon Gruenke | Kalamazoo Gazette

Workers continue cleanup of the Kalamazoo River from the July 2010 Enbridge oil spill near the 35th Street bridge in Galesburg on Wednesday.

[3] Recommendation: Enbridge should provide the documented statistical probability that the Michigan spill would occur (related to the fact that it did occur), and the statistical probability that such an incident might occur at any location for the Northern Gateway pipeline.

4.3.4 Construction Scheduling

Volume 7A, Section 8.5.6, page 8-13

Enbridge indicates “Instream watercourse crossing activities will be conducted during the allowable work windows (or outside the restricted activity periods) that have been identified for the particular crossing, unless a variance is specifically approved by federal and provincial fisheries authorities.” It is not clear under what circumstances a variance might be sought and whether important large rivers might be considered for variance applications. Water crossing construction activities within any fisheries restricted activity periods should not normally be permitted.

[4] Recommendation: Enbridge should (i) clarify under which circumstances they might seek a variance for watercourse crossings during a restricted activity period; and (ii) advise whether they will seek a variance for any fish-bearing river between KP 200 and KP 500.

4.3.5 Water Crossing Scheduling

Volume 7A, Section 8.5.6, pg. 8-13
The scheduling paragraph states that '*unpermitted activities are approved outside the allowable work window if watercourses are dry or frozen to the bottom or trenchless techniques are used'.* The wording within this paragraph suggests they will not follow regulations or best management practices if watercourses are frozen.

[5] Recommendation: Enbridge should clarify their intent whenever watercourses are dry or frozen to the bottom or trenchless techniques are used, and works are proposed outside the allowable work window, they will follow applicable best management practices, regulations and attain a variance prior to works if required.

4.3.6 Watercourse Diversions

Volume 7A, Section 8.5.6, page 8-16
Enbridge indicates "Watercourse diversions might be required to divert high-flow, braided or meandering watercourse channels temporarily or permanently, to assist construction access or pipeline installation." There is no cross-reference to where information about which watercourses may require diversion.

[6] Recommendation: Enbridge should (i) identify which watercourses between KP 200 and KP 500 are likely candidates for a diversion application; and (ii) commit to consulting with HLFN and EPMS if any watercourse diversions in their territories will be sought.

4.3.7 Right-of-Way (RoW) Planning

Volume 6A, Section 10.1, Figure 10-1, page 10-2 and
Volume 7A, Appendix A, Section A.3.1, page A-45
Right-of-way planning is ongoing, although Figure 10-1 (Hydrological Zones and Water Survey of Canada Stations) and other maps provide the potential route for the pipeline RoW. Section A.3.1 does not indicate that selection of the RoW will follow any existing RoW, and appears to deviate from a railroad RoW in the vicinity of the Athabasca River crossing. If the pipeline route shared the railroad RoW west beyond KP 200, it would appear that many kilometres of lands on the north side of the Athabasca River would be spared of new disturbance.

[7] Recommendation: Enbridge should commit to (i) following existing RoWs as much as possible; (ii) should follow the railroad RoW west from KP 200 to approximately KP 240, and if not, should justify the route selected in this area; and (iii) providing *Environmental Field Reports* (ASRD) to HLFN and EPMS for the pipeline RoW and water crossings from KP 200 through KP 500.

4.3.8 Blasting near watercourses

Volume 7A, Appendix A, Section A.3.9, page A-75

The Blasting Management Plan appears to restrict the key concern about blasting to management for Acid Rock drainage, although it lists mitigation for blasting impacts under a variety of circumstances. No specific mitigation including safe distance to prevent impacts to fish from blasting near watercourses is described. Detonation of explosives near water creates compression waves that produce a rapid rise in the peak pressure that can damage the swim bladder of fish and damage their eggs or larvae (Mahtab et al. 2005[2]). The use of explosives in and near fish habitat may also result in the physical and/or chemical alteration of habitat, including sedimentation that may cover spawning areas or reduce or eliminate bottom-dwelling biota that fish use for food (Wright and Hopky 1998[3]).

[8] Recommendation: Enbridge should (i) provide scientifically defensible support for their mitigation plans to prevent blasting impacts to aquatic biota, fish and fish habitat, including evidence of adequate blasting setback distances from fish-bearing waters; and (iii) HLFN and EPMS should be notified and consulted about any blasting plans within their traditional territories.

4.3.9 Riparian Setback Distances / Buffer Zones

Volume 7A, Appendix A, Section A.3.15.1, page A-93

The riparian setback distances are inconsistent throughout the documentation prepared by Enbridge. For example, Section A.3.15.1 mentions distances of either 16 m or 10 m depending on whether fish are present or not, respectively. Enbridge indicate “setback dimensions will vary with the setting and [crossing] method”. Other sections of the report mention 30 m as a setback distance. Minimizing setback distances can negatively affect fish habitat by reducing shade and introducing suspended sediments.

[9] Recommendation: Enbridge should (i) provide a table or summary that clearly indicates their planned setback distances for watercourse crossings under all

[2] Online at: http://docs.informatics.management.dal.ca/gsdl/collect/bofep1/pdf/WF/BOFEP6-2004-087.pdf
[3] Wright, D.G., and G.E. Hopky. 1998. Guidelines for the use of explosives in or near Canadian fisheries waters. Can. Tech. Rep. Fish. Aquat. Sci. 2107: iv + 34p.

circumstances; and (ii) provide justification for any case where a setback distance of less than 30 m is planned, especially for fish-bearing waters.

4.3.10 Riparian Recovery

Volume 7A, Appendix A, Section A.3.29.3, page A-146
Enbridge states "The potential for sediment deposition in watercourses is highest after construction of watercourse crossings for the pipelines and access roads, and for several years after installation, before riparian vegetation becomes established enough to reduce sediment loadings to watercourses." While their mitigation is to implement revegetation along affected riparian areas, they do not address the sedimentation effects that will be caused while the riparian remains disturbed prior to the establishment of vegetation. High precipitation events could cause erosion and high suspended sediment loads in streams prior recovery.

[10] Recommendation: Enbridge should address the requirement to provide mitigation to prevent erosion and high suspended sediment loads in streams while riparian vegetation is in the process of becoming established.

4.3.11 Specific Fisheries Habitat Protection Measures

Volume 7A, Appendix A, Section A.3.29.4, page A-147
Enbridge states "Because of the large number of watercourse crossings, specific fisheries habitat protection measures will be shown on the construction drawings, environmental alignment sheets and in the compliance database (see Sections 6.5 and 8.10)". The sections referred to do not provide construction drawings, environmental alignment sheets, or data specific to any watercourses. Therefore, it is not possible to evaluate fisheries habitat protection measures for any important watercourses between KP 200 and KP 500.

[11] Recommendation: Enbridge should provide to HLFN and EPMS specific fisheries habitat protection measures and environmental alignment sheets as soon as they are available for the Wapiti, Little Smoky, Simonette and other important rivers along the pipeline route from KP 200 to KP 500.

4.3.12 Traditional Knowledge and Fisheries

Volume A, Part2, Section 11.4.2, page 11-33
The description of fisheries in the Foothills Hydrological Zone cites a 27 year old reference for the existing conditions in waterways in the region (Paetz 1984). The Little Smoky River and its tributaries, including the Waskahigan River, are reported to have Arctic grayling,

walleye, northern pike, mountain whitefish and bull trout fisheries. Bull trout are reported in the Simonette River and Latornell River, along with Arctic grayling and mountain whitefish. While it is possible that the information is the same today, it would be appropriate to consult traditional users about their knowledge about fish in local rivers and lakes. No traditional knowledge was used in the historical fisheries descriptions of the Peace River or Athabasca River drainages.

[12] Recommendation: Enbridge should update their baseline and historical fisheries information with the knowledge of traditional users in the region, including HLFN and EPMS.

4.3.13 Cumulative Effects and Access to Fisheries

Volume A, Part2, Section 11.6.3.5, page 11-131
Enbridge states "The potential for the Project to contribute to regional cumulative effects because of chronic sedimentation and increased fish pressure due to long-term use of access roads is assessed in light of available mitigation and its likely effectiveness to reduce effects." It isn't clear how Enbridge will effectively prevent public access for such a long distance and with many water crossings. If access prevention is effective, HLFN and EPMS will be prevented from fishing in their traditional territory.

[13] Recommendation: Enbridge should (i) provide more details about the contribution of the project to cumulative impacts to important fish-bearing watercourses and (ii) commit to enabling HLFN and EPMS to continue to access all of the fisheries within their traditional territory.

4.3.14 Fish Habitat Compensation Plans

Volume A, Part2, Appendix 11-B, Section 11-B1, page 11B-5
Enbridge states "The conceptual plan is expected to be replaced by more detailed assessments of HADDs and compensation, as developed through the detailed engineering design and permitting phase. Final determination of HADD and compensation will occur after post-construction monitoring." It is very unusual to determine compensation as late as post-construction monitoring, as this typically occurs at the latest shortly after the approval stage.

[14] Recommendation: DFO should be asked to consider engaging the company and stakeholders in fish habitat compensation plans prior to construction.

5 Conclusions

Preparation of the environmental reports for a pipeline that is over 1,000 km in length, plus the terminal in Kitimat, is a major undertaking requiring the expertise of many professionals. Our task of identifying shortcomings and concerns for a specific 300 km reach of the pipeline route almost inevitably lead to concerns about insufficiencies about localized terrestrial vegetation, wildlife habitat, local species, and regionally important watercourses.

An overarching concern about any oil pipeline that is independent of location is the potential devastating impact that might be caused by a major leak or rupture, especially into sensitive waterways. While the likelihood of a major incident is low, Enbridge cannot guarantee that this will not happen. It is likely that with due attention to best management practices and mitigation, significant impacts related to construction and pipeline maintenance will be minimized. However, in many cases, Enbridge was not convincing of this in their assessments.

We presented our reviews that are sometimes very detailed and specific, in the hopes that HLFN and EPMS might better understand the western science approach that goes into such a major linear development. Not all of the information in our reviews is suited to non-scientists, but we tried to include information that was relevant both to natural environments as well as to traditional land users. Enbridge (as well as us) can learn much from those that spend time on the land and waters, like the people of HLFN and EPMS.