Hearing Order OH-4-2011
File No. OF-Fac-Oil-N304-2010-01 01

IN THE MATTER OF

ENBRIDGE NORTHERN GATEWAY PROJECT

JOINT REVIEW PANEL

FINAL ARGUMENT

Representing

Douglas Channel Watch

DCW Reg. Intervenor Murray Minchin* (page 1/33)
DCW Reg. Intervenor Dave Shannon* (page 18/33)
DCW Reg. Intervenor Cheryl Brown* (page 27/33)
DCW member Dave McRae (page 32/33)
DCW member Per Norman (page 33/33)

(The three registered intervenors* above will attend oral argument hearings in Terrace, BC, commencing June 17, 2013.)
Final Argument of Murray Minchin

Introduction

1) I would like to thank the First Nations of British Columbia who allowed Enbridge's Northern Gateway dual pipelines and supertanker port proposal review process to occur upon their lands, lands which they have never given up title to, nor negotiated away through treaties.

2) I would also take this opportunity to thank the Joint Review Panel members and National Energy Board staff for their patience and support for first time intervenors such as Douglas Channel Watch.

3) Thank you to the members of Douglas Channel Watch, environmental stewardship organizations, concerned citizens from Canada and beyond, as well as the dedicated journalists and experts who devoted time from their personal lives to ensure there was a clearer understanding of the risks associated with Enbridge's Northern Gateway proposal.

4) Thank you to the many other intervenors and lawyers, some of whom devoted an extraordinary amount of time on this review.

5) Thanks go to my family who fully supported my efforts in this process, even when major submission deadlines were unmercifully scheduled several days before Christmas.

6) Apologies, however, go to our daughter, who endured having my back towards her for too many hours while I researched or wrote at the computer, and for her having to endure far too many Enbridge related conversations for 25% of her young life.

7) It is with relief that intervenor's are finally able to share their views and opinions with the Panel, and where I will begin Final Argument.

Views and Opinions

8) If the Panel approves this project, thereby indicating the proponent had engaged in adequate consultation with First Nations, it will set the bar at an unsupportably low standard.

9) My guess is that many First Nations in British Columbia will consider the multigenerational impacts of bitumen spills too dangerous, and will fight this proposal every step of the way. They will be supported in this by the majority of British Columbians.

10) First Nations on the proposed pipelines route and along BC's coastline, individually or as a group, would surely fight and drag Enbridge's proposal through to the Supreme Court of Canada.

11) This would be duly noted by the many liquified natural gas companies wishing to cross these same lands and waters. Those companies, and other companies considering future large scale
projects, would do well to heed this lesson and expend greater time and resources ensuring adequate First Nations consultation and/or involvement.

12) Changes from the Omnibus Budget Bill C-38 resulted in the Panel no longer having authority to deny this project, and it will now be Prime Minister Harper who will decide if this project gets approved.

13) Will Prime Minister Harper allow Conservative Members of Parliament to have a free vote on this issue, to vote according to their own views, or the views of their constituents? I doubt it. Will he push the project through and risk losing his long coveted majority in the House of Commons, or even the Prime Ministership? Are there other unknown influences prompting him to push the project through despite the consequences politically? Time will tell.

14) It is of operatic proportions that Prime Minister Harper was drawn into politics because Ottawa was telling Alberta what to do. Ironic then, isn't it, that if he tries to push this project through against the wishes of the majority of British Columbians, he will have become that which he once abhorred and could lose the political power he's worked so long to achieve.

15) The 'Orange Wall' which now extends the length of BC's coastline (ridings voting NDP in BC's recent Provincial election) is a cannon ball across the bow for Enbridge, or any company wishing to expand existing liquid petroleum pipelines or export diluted bitumen and/or its byproducts through British Columbia. This Wall will be particularly strong against any projects proposing liquid petroleum supertankers onto BC's north coast.

16) An indication of the opposition Enbridge's Northern Gateway proposal could meet if approved is the Clayoquot Sound clear cut logging protests of the 1980's where, before the internet, over 10,000 people made their way to an isolated valley on Vancouver Island's west coast, and almost 800 were arrested. Consider then, how many thousands more would stand shoulder to shoulder with First Nations in protecting the multigenerational health of our salmon rivers along Enbridge's linear, Province crossing project.

17) British Columbians are asking several fundamental questions; if the Tar Sands are the economic engine of Canada, why is Alberta in debt, and why should BC shoulder the majority of risk for Alberta's mismanagement of their resources? Important questions considering British Columbians are unwilling to allow even exploratory drilling for their own oil and gas riches beneath BC's coastal waters.

18) As Douglas Channel Watch member, Dave McRae, said in concluding his Oral Statement in the Haisla community of Kitamaat, "There will be a wall".

19) Tar Sands industry insiders have called Northern Gateway a "dead man walking". It is my belief that the proponent is white knuckling itself through the process hoping an as yet unannounced Plan B will find better traction in the social license department, followed by support and/or compensation from Ottawa.
Challenges to Proponent's Witness Evidence

20) It was with great frustration that intervenors could not challenge answers given by the proponent's witnesses during the final hearings. More than once I heard intervenors saying the process was like trying to nail Jello to a wall.

21) I have chosen to take the final hearings official transcript quotes from my line of questioning on a subject, and follow those with quotes from the proponent's witnesses regarding that subject. Each grouping of quotes will be followed by my final argument challenges to those witness statements.

22) The transcripts used are from volumes #86 and #93 of the Final Hearings held in Prince George, BC, on October 10th and 18th, 2012.

23) There will be several locations where paragraph numbers jump back and forth; this is an artifact of intentionally questioning witnesses in a non linear fashion. To see that I have not edited questions or answers out of context, please refer to relevant paragraph sequences in the official transcripts.

24) A note on the format of the remainder of this document;
- paragraph numbers of quotes from the final hearings transcripts and who made them will be in (parenthesis),
- quotes from myself will be in italics,
- quotes from the proponent's proposal and the proponent's witnesses will be in regular text,
- and passages of particular note will be underlined by me.

25) My challenges to witness statements and recommendations to the Panel resulting from witness statements will be in regular text centred on the page.

26) Each sequence of quotes and challenges will be separated by;

   =    =    =    =    =    =    =

27) (6138. Murray Minchin) Madam Clerk, if you could bring up Exhibit B1-5, Adobe page 104, and the item I'm looking for is 11.2.

28) (6139. Murray Minchin) And under Control Centres, in paragraph number 2, it states, "The [Enbridge] Control Centre will be used to monitor and control the pipeline's pump stations, valve sites, and tank terminal facilities."

29) (6140. Murray Minchin) And continuing down to paragraph number 5, it states, "The proven equipment and software used at the Edmonton Control Centre will enable
operators to remotely monitor and control all elements of the pipeline systems, including the tank terminal, pump stations and valves, line pressures, flow rates, custody transfer, meters, gas and fire detectors, and numerous safety systems."

30) (6147. Murray Minchin) Well, in the first two paragraphs that I quoted from here you were indicating that you had control over the pipeline system from the control centre in Edmonton in May of 2010, and in July of 2010 was the Marshall rupture.

31) (6148. Murray Minchin) So if you were confident of those statements made in May of 2010, might there be other statements made within the proposal that might have the same level of credibility, let's say?

32) (6169. Ray Doering) And I think the question that Mr. Minchin had asked was of my -- are we still confident in the words that we've used here in the May 2010 filing document here as part of Volume 3 under Section 11.2, whether we're still confident about these statements subsequent to July 2010 and, certainly, we are.

33) It defies logic how the proponent could be confident in their "proven equipment and software" after the Kalamazoo spill, and how they manage to maintain that confidence despite results from investigations by the United States Environmental Protection Agency after the spill, and despite the EPA still finding submerged oil into the spring of 2013.

34) This raises questions such as, how many other claims, predictions, estimates, etc, in Enbridge's Northern Gateway proposal are as imprecise, and more importantly, what may be the consequences if this project is approved?

35) (6704. Murray Minchin) -- it’s my understanding that there is an operational life expectancy of this pipeline for 50 years. Do you foresee running it for any time longer than that and how long would that be?

36) (6706. Ray Doering) Really, the -- each pipeline that an operator manages has a unique internal corrosion management program, integrity management program associated with the operation of that pipeline, and a very valuable asset that’s proactively managed with that inspection management program really will have an indefinite life. In 30 years or 50 years, or beyond, the condition of that pipeline really will be the same as the condition when it was first put into service.

37) I cannot believe Mr. Doering honestly believes the above statement, though he must, as it was given under oath.
38) It is also unimaginable that anybody would believe his claim considering the proponent's spill record, and in light of this admission from Enbridge's own Corporate Social Responsibility Reports; "Despite our best efforts to prevent spills, incidents occur".

39) (6482. Murray Minchin) Moving on to Exhibit B83-7, Adobe page number 10 in Northern Gateway's Response 2.4 and 2.5.

40) (6486. Murray Minchin) So the question is, it appears that the Pacific Trail Pipeline will be built -- or construction started before the Northern Gateway Project JRP process is finished. Do you think Pacific Trail Pipeline will take the easiest, safest route through the Hoult Creek and Upper Kitimat River Valleys, and would that not force Northern Gateway to build on areas of greater risk?

41) (6487. Ray Doering) Yes, I would expect that PTP might select what you described as the easiest route through the Kitimat Valley. But based on the analysis that we've described here, it would not necessarily -- or a subsequent right-of-way for Northern Gateway, for example, would not be less safe.

42) Enbridge has stated they intend to place their wider dual pipeline right-of-way on the much steeper uphill side of the PTP pipeline in the Upper Kitimat River and Hoult Creek Valleys. At what slope angle would it no longer "not be less safe", and how often do the slopes in the Upper Kitimat River and Hoult Creek Valleys exceed that angle?

43) (6549. Murray Minchin) Could we move on to B83-7, Adobe page 13, please? And item 7.1?

44) (6551. Murray Minchin) This is Northern Gateway’s response to a Douglas Channel Watch response to our evidence: “A Forestry Technician is NOT a recognized expert in slope stability or avalanches with respect to construction and operation of the proposed pipeline and associated infrastructure such as the tunnels. Therefore, there is no need for a Forestry Technician to inspect the slope.”

45) (6552. Murray Minchin) Well, our concern is that, of course, a forestry technician doesn’t know these issues with respect to construction and operation of a proposed pipeline but what they do bring is an expertise in reading the forest for past events which might have occurred. Because they have special training as you and the Panel -- or the witness panel might agree, each of you carries specific training that makes your skill set unique and valuable.

46) (6553. Murray Minchin) And it’s our contention that a forestry technician will be able to evaluate the forest on the slope to a level that none of you are able to assess and would obviously
miss if you weren’t cognizant of the evidence that was left behind on the trunks and in the forest stand itself.

47) (6554. Murray Minchin) *So would you agree then that a forestry technician could add valuable knowledge to the past events which have occurred on a forested slope?*

48) (6555. Clive Mackay) *I think I would agree with your statement.*

49) As evidenced by the witness statement above, it appears the proponent agrees this information would be helpful in gaining a fuller understanding of the risks associated with this slope.

50) This slope is obviously of critical importance as it is where the proposed pipelines are to emerge from the west portal, and where the dual pipelines are proposed to make an aerial crossing of Hoult Creek, downslope of the portal in an area that; "May be subject to bouncing and rolling rock". Exhibit B69-7, Adobe page 270, geohazard detail ID 37, Hoult Tunnel - West Portal.

51) If the Panel so pleases, might the Panel seek the advice of a Forestry Technician to further understand the history of this slope, as there may be evidence of periodic massive avalanches clearing much of the proposed west tunnel portal slope of forest in the past.

= = = = = = = =

52) (6257. Murray Minchin) *If we could move on to Exhibit B83-7, and Adobe page number 63, please. And on that page I’m looking for item C.3.1.*

53) (6258. Murray Minchin) *And they’re speaking of the Kitsumkalum-Kitimat trough. “The seismicity hazards in the trough are as well defined as most other locations in western Canada. There is nothing that indicates a higher hazard along this valley alignment than nearby areas.”*

54) (6259. Murray Minchin) *So the question would be then; do you still believe this to be true?*

55) (6260. Barry Callele) Yes.

56) (6261. Murray Minchin) *Since the introduction into evidence of the Natural Resources Canada preliminary report on submarine and landslides and tsunami hazards in Douglas Channel, and the identified 50-kilometre fault line described therein, do you think there could be seismic risks in the Kitimat area that are greater than what was understood before the National Resources Canada preliminary report?*

57) (6268. Drummond Cavers) Obviously, this kind of zone is an area that people are going to be interested in and there will be some more work on it but, at this point, there is nothing to indicate
that we don’t have a safe pipeline route and that there’s any elevated seismicity risk on the West Coast.

58) (6274. Murray Minchin) *Would you agree that the Natural Resources Canada seismologists whose preliminary report was introduced into evidence in these hearings, they consider that to be a preliminary report indicating that there is further study needed. So that implies to me that there could be increased seismic risks in the area and, if there are increased chances of geologic -- or would increase seismic risks, increase spill probabilities?*

59) (6276. Drummond Cavers) It’s developed by the NRCan seismologists, a wide range of seismologists and it’s based on probabilistic modelling, based on observations of seismic events and on knowledge of the geologic structure of British Columbia and, indeed, of Canada because this modelling extends across Canada.

60) (6296. Murray Minchin) *Okay, just to tidy up this portion of it then, would you agree that since there have only been sensitive seismographs on the north coast of British Columbia for 50 years and geologic forces often occur outside that time frame and the fact that Natural Resources Canada is stressing that this is a preliminary report, would you agree that there could be increased seismic risks in this area?*

61) (6297. Drummond Cavers) Yes, we agree that it’s a preliminary report.

62) (6298. Drummond Cavers) We agree that there is -- that it is appropriate for ongoing assessment of this and other possible features and, however, we do not agree that this necessitates or indicates any need for change to the present seismic assessment for the project.

63) Interesting, how Mr. Cavers' confidence can divine future findings in studies yet to be done, in a field of study for which he has insufficient depth of knowledge.

64) Are there unresolved seismic risks in the Kitsumkalum-Kitimat Trough, which contains four hot springs on its eastern margin, Canada's youngest volcano at its northern end, and a recently discovered fault line at its southern end?

65) (6374. Murray Minchin) *Now, the Natural Resources Canada report is an ongoing study with an unfixed timeline. So my concern is -- well, that's why I ask, like, will you build this project without knowing what the seismic risks are?*

66) (6375. Drummond Cavers) The answer to your question is that -- and my colleague, Mr. Doering, I’m sure will want to amplify on this, but we find ourselves in a hearing process which is just one milestone and the whole nature of the regulatory process is that this is not the end.
67) (6380. Ray Doering) Only that, yes, we believe we have presented here a very robust process for incorporating information as it becomes available, gathering that information and making assessments.

68) (6381. Ray Doering) So we believe that process is in place and, really, I think, you know, the JRP will ultimately have to tell us whether they’re satisfied with the process that we’ve put in front of them.

69) (6404. Murray Minchin) Like, it’s interesting to hear your confidence in this matter when, in the Natural Resources Canada preliminary report, the head seismologist in Western Canada, Mr. Cassidy, states that there have been smaller earthquakes in the Douglas Channel area but they don’t know where the epicentres were, which implies that they don’t have accurate seismographs in this area.

70) (6405. Drummond Cavers) Well, the -- depending on the characteristics of the earthquake, it -- the location of the epicentre may have some uncertainty to it.

71) In the amended Agreement Between the National Energy Board and the Minister of the Environment Concerning the Joint Review of the Northern Gateway Pipeline Project, at 10.1, it states; "The Panel may request federal authorities and provincial departments having specialist information or knowledge with respect to the project to make this information or knowledge available".

72) I was unable to question the Federal Government witness panel, so left my questions in the hands of another intervenor who chose not to use them. As a result, despite Natural Resources Canada submitting late evidence regarding a newly found fault line in Douglas Channel, I am not aware of one question being asked of Mr. John Cassidy, the Natural Resources Canada Seismologist on the Federal Government witness panel.

73) If it so pleases the Panel, might the Panel recall Mr. Cassidy to clarify these risks? Might the Panel also request a paleoseismological study to better understand the frequency and size of past seismic events in the Kitumkalum-Kitimat Trough?

74) The reason for this request, beyond the obvious impacts to the overall proposal, is that Enbridge has recently increased the storage capacity of their proposed tank farm (which is perched on a ridge above Douglas Channel and close to the Kitimat River estuary) to 1.3 billion litres.

75) Without these seismic risks being investigated, those 1.3 billion litres could spill from the tanks due to ground shaking they weren't designed for, and Kitimat would join
Fukushima, Chernobyl, and Bhopal as world famous examples of massive, devastating, globally recognized technological failures.

76) (15452. Murray Minchin) Yesterday, Northern Gateway Pipeline said that their time commitment to respond to terrestrial Tier 1 and Tier 2 spills was 6 to 12 hours. So my question is why the six-hour difference?

77) (15456. Kevin Underhill) Yes, we presented that information yesterday. We were asked whether we could meet that 6 to 12 hours, which is -- it is referenced in the PHMSA Regulations, and we had indicated that we can. Each scenario will be different, and of course, our goal and objective would be to be able to respond much quicker than that, but acknowledge that there are some locations that require more transportation from a logistical perspective but our goal is to respond as quickly as possible.

78) (15457. Murray Minchin) Thank you. And just to clarify, like in that respond on Exhibit -- you said that it was to respond to a Tier 1 or Tier 2 spill. So I just want to clarify what 'respond' is in this context. Does that mean that it’s arriving on site, assessing the situation in terms of safety and then mobilizing forces; it doesn’t mean actually starting to contain the spill at its source does it?

79) (15458. Kevin Underhill) Yes, we did comment on that yesterday, that it is arriving on site, it is getting -- it will take time to mobilize the necessary forces to address the spill, in terms of equipment, further personnel, but yes, respond is to get somebody initially onsite, assess the situation and ensure that they’re assessing it in a manner that they will be calling forth the necessary resources to address that particular incident.

80) (15689. Murray Minchin) Okay, if I could get Madam Clerk to pull up Exhibit B3-21, and Adobe page 22.

81) (15690. Murray Minchin) And in paragraph number 1, sentence 3, it states: "Hunter Creek is a first-order tributary with high wildlife and fisheries values, in a remote location. Based on water velocities, a release at this location could reach the Kitimat River estuary 60 km downstream within four to ten hours depending on river discharge."

82) (15691. Murray Minchin) So are these times correct?

83) (15691. Kevin Underhill) Yes, they are.

84) This is an admission by Enbridge that a spill into Hunter Creek would have already reached the Kitimat River estuary in the time they estimate it would take their on scene commander to arrive and begin assessing the situation.
85) (15523. Murray Minchin) ...I was wondering, if Mr. Cavers’ confidence is not enough to hold back the forces of nature, would a Tier 4 event be if both proposed Northern Gateway pipelines and the Pacific Trails pipelines are ruptured?

86) (15524. Kevin Underhill) The Tier 3 is the largest extent of resources that one would bring to bear. It involves potentially international sources from abroad. So that is the -- that is the worst-case scenario, Tier 3.

87) This is an admission that Enbridge will not have the resources to adequately respond to a spill in the Upper Kitimat River Valley in a timely fashion. Kitimat is over 1400 kilometres by road from both Calgary and Vancouver, and an unknown distance from their, "international sources".

88) Much of the proposed pipelines route is more isolated than the proposed Hunter Creek crossing.

89) (15731. Murray Minchin) If we could get (exhibit) B83-7 up, Adobe page number 70.1 and 70.2.

90) (15732. Murray Minchin) And here, it states: “It is expected that the Kitimat and other major rivers that are tending to erode laterally will carry significantly (sic) amounts of woody debris. Should an incident occur during a period of flood when a large amount of debris is carried by the river, response focus would shift primarily to upstream sites where there is greater potential for effective containment and recovery.”

91) (15747. Murray Minchin) Madam Clerk, if we could have B83-7 and this is Adobe page 52 this time. And it’s 59.1 and 59.C.

92) (15748. Murray Minchin) Now, it’s kind of hard to see in this light but, in that photograph -- if you could pull into that a little bit, please -- this is a forest service bridge on the Upper Kitimat River and is listed as a potential boom location because of its ease of access and campground which could be used as a staging area.

93) (15760. Murray Minchin) And in the photograph, there’s an arrow ‘B’ that points towards the paint that’s been rubbed off the support for the bridge. I mean -- and, like, even at this point there’s white caps with a low flow in the river that it’s at right now, which is probably pretty close to normal. But in a flood situation, it would be, what, ten feet higher in that photograph?

94) (15761. Murray Minchin) So as a boom location, during a flood when there’s too much debris downstream and this is supposed to be a boom location during a flood, how effective would booms be at this location during a flood?
95) (15568. Greg Milne) We’ve mentioned in some of the past days that we are developing or have developed a framework for a -- the spill response planning process that we intend to undertake. And one of the things that -- one of the first things in there really, starting in 2013, is to undertake a capacity review which looks at what are the scenarios that we would potentially be faced with, things like we're talking about today.

96) (15670. Greg Milne) And that capacity review, which as I mentioned will be in 2013 -- starting 2013, probably extending to 2014 and beyond, would form the basis for much of the more detailed planning that we would then undertake in 2014, 2015, 2016.

97) The Upper Kitimat River and Hoult Creek both exhibit large amounts of woody debris (logs and mature trees with root systems attached) deposited on gravel bars by frequent floods. It will be impossible to avoid logs and trees by moving upstream.

98) This is one of many examples where an intervenors attempt to test the evidence was sidestepped by witnesses claiming answers would be available at a later date after future studies, or future detailed engineering.

99) This was a major frustration for all the intervenors, and calls into question the validity of the whole review process when intervenors had but one opportunity to test the evidence, and in many cases that evidence did not exist.

100) (15699. Matthew Horn) As we look at hydrocarbons and as they transport down the river, there are a couple key components that come into play. And you need to think of the oil not as a single mass of just one unit, but that portions of it go different places. Some of it will evaporate, some of it will strand on the shorelines, some of it will become entrained in the water column, and some will make its way down into the sediment.

101) (15700. Matthew Horn) And -- excuse me -- as you look at rivers like this and as hydrocarbons move down, especially cobble rivers, there is hyporheic flow where you can actually have water that enters into the interstitial space, the spaces between the rocks and you can get entrained oil in there. But you also do have relatively consistent flow that pushes through.

102) (15947. Murray Minchin) Madam Clerk, could I please see Exhibit B83-7, and this is Adobe page number 32 and it's 36.1. And at the bottom, it says: "Submerged oil present at Marshall in 2011 was typically in the form of millimetre-sized droplets distributed in the sediment matrix."
103) (15948. Murray Minchin) Now, wouldn't millimetre-sized droplets distributed in the sediment matrix as experienced in the Kalamazoo spill, translate into millimetre-sized droplets distributed amongst spawning gravels and salmon eggs in North Coast B.C. salmon-bearing rivers?

104) (15951. Matthew Horn) Without kind of a really detailed scenario it would be really hard for me to give you a specific number and say it's X millimetres or X size. I mean, we're not saying that there wouldn't be oil in the sediments, it's just it's hard to say the size.

105) This is an admission from Enbridge that despite claims that dilbit doesn't sink, the heavier constituent, bitumen, does, and that bitumen would be deposited in the spawning gravels of the Fraser, Skeena, or Kitimat River watersheds in the event of a spill into those waters.

106) (15785. Murray Minchin) If we could go now to B83-10, Madam Clerk. And we're looking for Adobe page 24, and Item 4.2. Let's see, I'm looking for an item entitled “Pre-Positioned Equipment Caches and Site Preparation”.

107) (15790. Murray Minchin) “Given the characteristics of the location of the Hoult Tunnel Test Portal (mountainous terrain and high snow fall), locating an equipment cache either in or close to the tunnel would be strategic. This cache may include snow removal and road maintenance equipment so that, in response to an incident, personnel can be mobilized to clear and maintain road.”

108) (15791. Murray Minchin) So does this mean you will not be clearing snow on a forest service road from the highway to the clear-cut opposite the Hoult Tunnel’s west portal on Hoult Creek Valley during winter months?

109) (15792. Dale Burgess) No it does not. I think we’ve indicated on the record that we would maintain road access to the tunnel portals at all seasons of the year.

110) (15793. Murray Minchin) Okay. Well, given the steepness of the Upper Kitimat slopes where the road is located in the Upper Kitimat Valley and the Hoult Valley, are you aware of the WorkSafeBC restrictions on snow removal and avalanches on extreme side slopes?

111) (15794. Dale Burgess) Yes. We would follow all the WorkSafeBC regulations.

112) (16796. Murray Minchin) Are you aware of how much snow on average accumulates in the bottoms of the Upper Kitimat and Hoult Creek Valleys at this time?

113) (15797. Jeffrey Green:) Our understanding is it’s typically in the order of eight or nine metres of total accumulation.
114) Nine metres of snow accumulation on a narrow valley bottom is less than what accumulates at higher elevations. During and after large snowfall events, which can last a week or more, access would not be possible as cannon crews worked to keep avalanches to a manageable size.

115) The road would be closed for the length of the storm, then for a longer period as the road was cleared of avalanche debris. It is questionable in several locations whether equipment and personnel would be allowed on the slopes by WorkSafe BC due to the steepness of grade and snow depth.

116) It is interesting to note the Avalanche Technician who declared the proposed forested west portal slope to be safe from avalanche might benefit if the project is approved by providing crews to manage avalanche danger in the Upper Kitimat River and Hoult Creek Valleys. This concern over possible bias by contractors was also raised in the Final Argument of Doug Beckett.

117) (15883. Murray Minchin) Okay, Madam Clerk, if you could now go to Exhibit B83-7, please. And I’m looking for Adobe page number 62, Item Number C.2.

118) (15884. Murray Minchin) Northern Gateway’s response to this information -- or to this is -- let’s see, the last two sentences in that paragraph are: “There are many factors which affect the ability to recover submerged oil including, among others, water temperature, depth, characteristics of the submerged oil and submerged oil concentration. Northern Gateway believes detection and recovery in colder temperatures would still be possible, but likely at [a] reduced efficiency.”

119) (15895. Murray Minchin) Could somebody explain how cold temperatures would reduce the efficiency of submerged oil clean-up?

120) (15903. Matthew Horn) So during low-flow, during these cold winter temperatures, the viscosity of the oil is definitely going to increase; it’s like molasses, the colder it is, it just gets more thicker, basically.

121) (15914. Murray Minchin) Okay, thank you. But my concern wasn’t necessarily a spill in the wintertime. It would have been how clean-ups, after a spill, let's say, happens during a flood with a lot of sediment in the water column and you have a lot of dilbit, because that's what my big concern here is, settling out to the bottom of the -- well, being entrapped.

122) (15915. Murray Minchin) And it's my understanding that the clean-up in the Kalamazoo is shut down every winter due to winter conditions. So I checked the Marshall, Michigan, weather
stats for the day that they shut down for winter conditions and it was minus 3 Celsius at night and plus 9 Celsius during the day.

123) (15918. Kevin Underhill) However, yes, on the river itself, our activities were suspended during the winter months because of ice and other factors but it did not stop our clean-up.

124) This is an admission from Enbridge that spill clean up in the cold water of the Kitimat River, or other watercourses in British Columbia, would be shut down due to winter and/or cold water conditions for longer periods than was experienced in Marshall, Michigan.

125) Shutting down clean up operations due to minus 3 Celsius at night and plus 9 Celsius temperatures during the day, or colder, would have a significant impact on the length of delays for spill clean up attempts in British Columbian rivers.

126) (6658. Murray Minchin) Now, in Exhibit Number B1-5, on Adobe page number 14, under "Quality Audits" it states from Northern Gateway that: "Periodic internal audits will be conducted for all aspects of the Project. The prime objective of the audits will be to document compliance. Identified deficiencies will be documented for resolution and follow-up."

127) (6659. Murray Minchin) So are you saying here that you will -- you intend to or hope to self-audit yourselves and all the contractors for this project?

128) (6660. Tom Fiddler): Yes, that's the intent. We have a very robust quality management system and program, and one element of that is self-audit activities by functional expertise within the organization that oversee best practices and standards and practices, both engineering and construction.

129) How can the proponent make yet another grandiose claim such as this despite their recent Kalamazoo experience, and despite the following NEB statement; "The Board's priority is to protect Canadians and the environment. Pipeline companies are required to continually assess the hazards of their operations and upgrade their facilities to remain in full compliance with regulatory requirements. As a result of implementing effective management systems, a company ensures that pipeline systems are designed, constructed, operated and maintained to comply with those requirements. The Board, therefore, directs Enbridge to include in its corrective plan, actions designed to correct the systemic deficiencies that have led to the current non-compliance."

130) I believe the above quote is not on the record for this proposal, but it is a March 13, 2013, statement from the NEB which Enbridge
is fully aware of, and which has acute relevance in establishing the validity of Enbridge's witness statements regarding competency.

131) Please find the original document here:

132) (16017. Murray Minchin) Under what conditions would a unified command recommend the burning of the (Kitimat River) estuary?

133) (16019. Kevin Underhill) Again, I can’t speak hypothetically, it would go through the appropriate review under regulatory bodies with input from key specialists to determine if that was an acceptable approach.

134) (16025. Murray Minchin) Would Northern Gateway Pipelines ever dredge the Kitimat River to remove submerged bitumen or dilbit?

135) (16026. Kevin Underhill) Similar response, Mr. Minchin, that any aggressive activity like that would involve the decisions of the incident command and several regulatory bodies who would be looking at harm versus benefit.

136) I believe it is safe to say the majority of British Columbians do not want to risk seeing their estuaries bitumen soaked and burning, or having their rivers spawning gravel dredged and destroyed.

137) (6178. Ray Doering) But really, at the end of the day, it's the Panel's decision as to whether we have indicated that we have considered the issues, provided the necessary information and assessed appropriately the risks and so on associated with the operation and I think, at the end of the day, it's up to the Panel really to tell us if we've considered enough.

138) Indeed.

Recommendations to the Panel
139) Douglas Channel Watch would ask the Panel to deny Enbridge's Northern Gateway dual pipeline, tank farm, and supertanker port proposal.

140) It is Douglas Channel Watch's contention that the Achilles heel regarding the dual pipelines in Enbridge's proposal are hazards found within the narrow, steep, geologically young valleys east and west of the proposed tunnels, and the potential for earthflows in the main Kitimat Valley.

141) Compounding these dangers is the Pacific Trail Pipeline natural gas pipeline in the Hoult Creek and Upper Kitimat River Valleys, which has already established a right of way on the safest path on the lower slopes through these valleys.

142) We would also request, considering the preponderance of geologic, marine, seismic, and weather related risks through the northern Coast Mountains and marine environment on British Columbia's north coast, that the Panel recommend a ban on all liquid petroleum pipeline projects to the north coast of British Columbia.

143) Enbridge is but the first liquid petroleum pipeline company to reach this level of review, and others could follow. While proposals may come and go, those geologic, marine, seismic, and weather related risks will remain the same.

144) An additional reason for recommending there be no liquid petroleum pipelines through BC's north Coast Mountains is that there are many natural gas pipelines being proposed to BC's north coast, and history shows natural gas pipelines can be converted to carry liquid petroleum products.

145) The Panel had committed to overfly the whole proposed project area, and as I understand, has done so except for the Upper Kitimat River and Hoult Creek Valleys due to poor weather.

146) Considering the extreme topography of the Upper Kitimat and Hoult Creek Valleys, and how that terrain effects the heavy rains and snows experienced there, I suggest the Panel must ensure they overfly or drive into these valleys before coming to a conclusion on this proposal.

Conclusion

147) According to the reference guide, Determining Whether A Project is Likely to Cause Significant Adverse Environmental Effects, prepared by the Canadian Federal Environmental Assessment Office, it states, "The Act is clear that the project may be allowed to proceed if any likely significant adverse environmental effects can be justified in the circumstances."

148) This is the fundamental decision the Panel must come to.
150) This proposal may be for a set number of years, but the proponent claims the Northern Gateway pipelines, "...will have an indefinite life. In 30 years or 50 years, or beyond, the condition of that pipeline really will be the same as the condition when it was first put into service".

151) Considering the dynamic geologic, seismic, and weather related forces these proposed pipelines will be subjected to as they pass through BC's north Coast Range, combined with Enbridge's past history of spills in much more benign landscapes, and their stated intention to operate these pipelines well beyond 50 years, there appears to be a certainty of a major pipeline spill.

152) The proponent also wishes to increase the volume of flow of diluted bitumen from the applied for 525,000 barrels per day, to 850,000 barrels per day. Besides increasing pressure within the pipeline this will increase the number of supertankers, thereby increasing the probability of a supertanker spill into the north coast marine environment.

153) In addition to those known risks, there may be unresolved seismic risks in the Kitsumkalum-Kitimat Trough.

154) A painful lesson of inadequate design was learned at the Fukushima nuclear plant which was succinctly summed up by former Tokyo Electric nuclear engineer, Tsuneo Futami; "We can only work on precedent, and there was no precedent".

155) Do we dare risk British Columbia's rivers and coastline by willfully choosing not to assess potential seismic threats? What of First Nations cultural connectivity to those resources, or BC's tourism industry to name but two?

156) Does the Panel feel it is "justifiable in the circumstances" to virtually guarantee that this generation or the next will have to contend with the devastating effects of pipeline and/or supertanker diluted bitumen spills, or 1.3 billion litres of diluted bitumen spilling into Douglas Channel after an earthquake the storage tanks were never designed for?

157) Does the Panel trust the proponent's claims of competency despite overwhelming and damning evidence to the contrary?

158) If approval is recommended by the Panel, or if Prime Minister Harper disregards the Panel's recommendation to deny the project and tries to force it through, against the majority of British Columbians' wishes, you will find me somewhere along 'The Wall' exercising my right to legal, non-violent, civil (dis)obedience. The Panel members, NEB staff, and anybody else who wants to join us will be warmly welcomed.

159) This concludes my portion of Douglas Channel Watch's final argument.

Murray Minchin
May 29, 2013
Final Argument of David Shannon

Gateway Environmental Monitoring (GEM) Sites:

Of the six GEM stations in the CCAA, I would argue that only the one situated at Emilia Rock stands a reasonable chance of detecting both inflow and outflow winds in the Douglas Channel.

Guidelines from the World Meteorological Organization (WMO) for adequate placement of wind measuring devices (anemometers) clearly state that significant obstructions in the near vicinity of the device should require the device to be located a distance ten-times the height of the obstruction away from the obstruction (See lines 5426-5430 of Transcript Volume #160).

At least four of the six GEM stations clearly violate this requirement:

1. See Kersey Point on adobe page 36 of B17-19, reproduced below. This station would be best positioned to measure winds across the rocky tip, perpendicular to the NE-SW orientation of the Douglas Channel, the end result of which is not a natural direction for either inflow or outflow winds:

![Kersey Point Image]

2. See Dorothy Island on adobe page 49 of B17-19, reproduced below. This station would also be best suited to measure winds across the rocky tip, perpendicular to the NE-SW orientation of Devastation Channel; similarly not a natural flow for either inflow or outflow winds:

![Dorothy Island Image]

3. See Wright Sound on adobe page 8 of B17-20, reproduced below. This station would also be completely blocked from measuring winds down the channel from the north as described in the text of the report, and the height of the background forest would also no doubt deflect onshore winds
perpendicular to the channel, and would be a poor location to detect N/S inflow or outflow winds:

4. See **Wall Island** on adobe page 21 of B17-20, reproduced here, which is also heavily obscured by the forest from winds blowing into the CCAA from Hecate Strait:

Supporting evidence for the inappropriate location of these weather stations is the proportion of time “calm” conditions are registered at each site:

1. **Kersey Point** registered calm conditions between 40-67% of the time (adobe 39-42 of B17-19). It also registered **no** appreciable winds, through all seasons, from the S to WSW direction, which represents 68° of the compass rose.

2. **Dorothy Island** registered calm conditions between 53-93% of the time (adobe 52-55 of B17-19). It also registered **no** appreciable winds, through all seasons, from the SE to NW direction, which represents 180° of the compass rose.

3. **Fawcett Point** registered calm conditions between 11-19% of the time (adobe 66-69 of B17-19). It also registered **no** appreciable winds, through all seasons, from the NNW to NNE direction, which represents 23° of the compass rose.

4. **Wright Sound** registered calm conditions between 46-57% of the time (adobe 11-14 of B17-20). I doubt that this amount of “calm” would be the experience of the inhabitants of Hartley Bay, just to the north of Promise Island, on which this station is situated. The station also registered **no** appreciable winds, through all seasons, from the ENE to NW direction, which represents 103° of the compass rose.

5. **Wall Island** registered calm conditions between 34-42% of the time (adobe 24-27 of B17-20). It also registered **no** appreciable winds, through all seasons, from the ENE to NW direction, which represents 45° of the compass rose.
I find it very difficult to comprehend that pooling all six GEM stations into a kinematic wind model could possibly generate any meaningful results, since it would require artificially turning off the data from stations that do poorly at registering inflow winds while inflow winds predominate, and turning off the data from stations that do poorly at registering outflow winds while outflow winds predominate.

It would also be pointless to take each separate GEM station as an independent indicator of local conditions without creatively pooling all the stations, ignoring what each one cannot represent.

I contend that the pooled estimate of these six GEM stations would underestimate the real wind conditions on the water in the CCAA, and it would have been more appropriate from the beginning to place a few well located wind and wave measuring buoys in the channels, away from the forests and elevated land masses that would obscure them from registering the wind on the water, where it counts.

I find it astonishing that the technical method of using the Kinematic Wind Model (described in paragraph 3 on adobe 23 of B17-21) to match the observed data with the modeled data to give “good results” was to do the following:

“The remedy was to construct a two-dimensional volume-conserving interpolation scheme, referred to as the kinematic wind model. The topography of the region was downloaded from a Natural Resources Canada website (Natural Resources Canada 2004) and interpolated onto a 400-m un-rotated grid. Elevations less than 200 m were assigned a value of zero, and elevations greater than 200 m were assigned a very large value, so that the result was an interconnected network of channels of uniform depth, bounded by high cliffs. This approach is somewhat simplistic, but gave good results and executed relatively rapidly.”

Mathematically manipulating the shoreline landforms this way will fail to take account of the sudden blasts of wind descending from a mountainous coast to the sea; a so-called “williwaw”, sometimes referred to as the treacherous “mountain waves” encountered by coastal aircraft pilots. In the second last paragraph of his letter of comment (A47044), of December 31, 2012, Mitch Roos puts it this way:

“Finally! Simulations. You state the problem well Mr. Rose. The fact that it's only international experts" and "B.C Pilots" and that they "concluded" that the "proposed" routes are "safe for tankers to navigate." Done without local knowledge, without lifetimers such as the peoples of Hartley Bay, Kitkatla and others of the Tsimsian nation. The Haisla whom have lived at the end of Douglas Channel just a little longer than you. The Haida, who have the knowledge of Haida Gwaii flowing through their veins. Knowledge, it flows through all of us who live here. We know what the real deal is and will ask why the williwaws, any given riptides zone, heavy arctic outflows, big tides, heavy numbing rains, massive snowfalls, engine loss midturn around a missing island, etcetera is not part of the simulations models. Enbridge is using
mathematical models that give you averages, average river flow, average wave heights for a given area based on the full year, with nice summer months factored in. If based on realities like a storm in January, on a big tides ebb cycle, those three hours of pure hell will make a Mathematical model showing true sea conditions.’’

I contend that artificially removing the obstructions that affect the measured results, and thus “widening” the channels accordingly by assigning the coastal elevations below 200 meters a value of zero, would “slow the winds down” to account for the inadequacy of the GEM stations in representing a true situation. I find this to be a very misleading manipulation.

Response to my question of whether the GEM station wind flows were ever validated by anemometer measurements on the water near the stations was given in this discussion with Mr. Jeffrey Green between lines 6907- 6909 of Transcript Volume 137:

“6907. **MR. SHANNON:** No, what I was trying to suggest was that even just an anemometer mounted on a vessel with a 10-metre mast situated some distance offshore to confirm what was being measured at the monitoring station at that time. It’s a very simple measurement to take.

6908. Would that have been a good thing to do?

6909. **MR. JEFFREY GREEN:** It’s a simple thing to do. To do it effectively, you would have to do a great deal of those measurements.”

It concerns me that for completeness, this was never done, from what I take from the reply. I believe this is an important confirmation which is missing from the scientific completeness of the Hayco report (‘‘TDR Wind Observations in Douglas Channel and Camaano Sound’’ found in B17-19 to B17-30).

The fact that data from Kersey Point and Dorothy Island are missing from adobe pages 38-40 B21-17 leads me to conclude that the observations didn’t fit the modeling very well for reasons I’ve just discussed.

From the evidence, the only data that provided consistently reasonable translation between modeled and observed results was from the two weather buoys (South Hecate and Nanakwa Shoal) as described on adobe page 41 in B17-21. This was for the period 2004, before the six GEM stations were available.

To use the existing data with or without the GEM stations as an input to the oil spill trajectory model would be misleading, since for example, the true sea state of very choppy waves would be unaccounted for in some of the more extreme weather which this channel is very capable of producing. Oil booms and skimmers would not work at all well in these conditions in capturing the spill.
**Trivializing the Negative Impacts and Presupposing Positive Outcomes:**

Throughout the Transcript testimony, there were many examples by Northern Gateway’s expert witnesses of downplaying any negative consequences (of an oil spill) to the project, for example:

- Killer whales are smart enough to avoid an oil spill,
- Beaches often rebound in better condition after cleanup of an oil spill than they were before the spill,
- Herring populations were already in decline before the spill occurred, and it cannot be proven that the oil spill had anything to do with their further decline,
- Ditto for salmon,
- And this series from Transcript Volume 141:

  “12268. **MR. McCORMICK:** *If bioavailability (of oil) were to increase, would it also increase the toxicity of the oil to the aquatic species and life stages that come into contact with it?*

  12269. **DR. ALAN MAKI:** Yeah, to the contrary, when oil’s absorbed to fine particulates, it’s a fairly tight bond and what we see typically is that it makes oil or residual hydrocarbons much less bioavailable to exert effects on any biota, either through direct exposure or through ingestion.

  12270. The bond that’s formed is a fairly, fairly tight covalent bond that keeps the oil together and we’ve done studies with oil bound to sediments. *It passes through the gut of invertebrates and fish essentially unchanged and does not desorb, so it does not become more bioavailable.*”

After hearing this type of “minimizing” testimony, it’s hard to believe that the citizens of Alaska (Exxon Valdez) and the Gulf of Mexico (Deepwater Horizon) really had any valid concerns for the effects of the oil spills in their regions. I find the implied suggestions of no cause for concern to be quite ludicrous.

I am also bothered by the loosely phrased statistical waffling in B3-34, an example of which follows:

“12.7.4 Prediction Confidence: Loss or Damage to Fishing Gear

*There is a low level of certainty for the prediction of not significant* for residual effects and cumulative effects from marine transportation on the loss or damage to fishing gear. Prediction confidence is considered low because there is limited information available on the location of marine fishing vessels and the amount of historical data about loss or damage to fishing gear as a result of vessel collisions within the CCAA. The establishment of a Fisheries Liaison Committee and joint efforts to coordinate activities
should increase confidence that use conflicts can be avoided. **Prediction certainty is expected to increase as further information is obtained** pertaining to location of marine fisheries and current detrimental effects on fishing gear in specific areas.”

Good science does not state the outcome before the facts are in, and should not presuppose that the significance will “go the right way” as further information is obtained. There either was or was not found to be a significant effect. **Full stop.**
Shipping Incidents in the Open Water Area

In the public record, a lot of concern has been voiced about incidents, both actual and potential, in the CCAA. Of perhaps greater concern would be the possibility of tanker incidents happening after the escorting tugboats would have departed the tanker in the Dixon Entrance or Hecate Strait where the weather can be particularly severe. Such a situation could leave the tanker - especially during a power failure, navigation failure, or loss of propulsion – prone to a severe shipping incident and major oil spill.

- This letter of comment by Arianne Loranger-Sandon (A2V4U2) speaks of a container ship off Prince Rupert running into severe weather, outside the area for immediate tugboat assistance in January 2012. Had the incident occurred on a crude oil tanker in the Dixon Entrance, which is known for sudden storm development, the outcome could have been a whole lot worse;

  “This past weekend a Cosco container ship sailed directly into hurricane force winds off of BC’s north coast. The predictions were for wind forces up to 130 kilometers/hr and sea heights over 30 feet. These predictions were issued on Friday, January 20 yet the Container vessel, Cosco Yokohama flagged in Liberia, sailed directly into it.”

- On Christmas day 1979, the ore carrier “Lee Wang Zin” sank in a severe storm after presumably running aground on Celestial Reef in the Dixon Entrance. The full details are shown in the TSB investigation starting at D187-8-15 and discussed in Transcript Volume 160 starting at line 5251. A laden tanker in similar distress would have the potential for an enormous oil spill which could affect the coastlines of Haida Gwaii, the B.C. northcoast, and Alaska.

No amount of mitigation could cope with the perfect storm in a situation where a responding tugboat also experiences a loss of power for any reason.
**Crude Oil Tanker Corrosion:**

The COT report file as evidence in D187-5-2 shows research conducted in the Netherlands for the OCIMF (Oil Companies International Marine Forum). I introduced this to the Government panel in Transcript Volume 170. The work was conducted to address the concerns of crude oil tanker owners about maintaining the epoxy coated linings of the cargo tank bottoms of their ships. These coatings cost many millions of dollars, and the breakdown of their coverage was a growing concern with the shift to crude oils containing high levels of naphthenic acids, water, and sulphur— as are present in typical dilbit crudes such as the product Northern Gateway intends to ship.

The results were a cause for tanker owners showing significant blistering after only six months of exposure to oils with higher TAN levels (TAN = Total Acid Number, represented by the number of milligrams of potassium hydroxide (KOH) required to neutralize a gram of oil). My concern continues to be the accelerated corrosion of cargo tank bottoms of dilbit-carrying tankers once the epoxy bottom coating has been compromised. With all due respect to the testimony of Mr. Keith Michel (Transcript Volume 160);

“5359. **MR. KEITH MICHEL:** There’s always some water on the bottom of cargo tanks.  
5360. **Tankers are designed to carry a wide range of products.** You know, crude oils that have a - a large range of properties, acidity, tan values, water content, sulphur content; they vary significantly and tankers are designed to carry this range of cargos.”

If this is true, the work done by the COT labs (D187-5-2) would not have had the urgency that it did if “tankers were designed to carry this range of cargos”

With respect to Microbial Induced Corrosion on cargo tank bottoms;

“5404. **MR. KEITH MICHEL:** Inspections are done close-up, visual inspections are done of coatings. And this is a real advantage of double-hulled tankers, especially those built in the last 10 years which have been subject to IMO requirements for permanent means of access.  
5406. **So, with that close-up inspection you can detect breakdown in the coatings and these are then required to be repaired.**

5407. **MR. THOMAS WOOD:** I would add to that that it is actually very easy to see these particular cracks and I’ve observed them myself because the coatings that we use on the inside of cargo tanks and ballast tanks are generally a lighter colour.

5408. **And when you do get this kind of cracking you get the -- some iron oxide coming out of that, it stains it brown, very, very easy to see and very, very easy to repair.”

I believe the experiences these expert witnesses refer to do not consider the latest dilbit range of products and the combined effects of coating degeneration, and MIC corrosion on cargo tank bottoms which can progress very much faster with the high-sulphur oil than with lighter, sweeter conventional crude oils that would have constituted most of their experience.
To my knowledge there have been no VLCC shipments of dilbit on the world’s oceans to date - the majority are now handled by the smaller Aframax tankers in less severe southcoast waters. This project would be an experiment we should not conduct in the waters of Canada’s north coast.

Dave Shannon, Terrace, B.C.
Final argument of Cheryl Brown

The Northern Gateway project has huge implications for a large scope of areas and they include:

- the expansion of the tar sands with increase production and availability of hydro carbon
- the increase of the production of world wide green house gases as a result of the increase of available hydro carbon
- the impact of the pipeline development and maintenance with the risks to sensitive wildlife such as caribou and grizzly bears
- the disturbance of salmon habitat with declining stocks as a result
- the lack of recognition of cumulative impacts on the environment from multiple resource projects. On a project this size and impact this is an unacceptable omission.
- The significant disturbance of unique terrestrial and marine landscapes and biodiversity that are unique to the world
- the significant alteration of the marine environment due to increased ship traffic
- the commercial and societal impacts to the regions re a boom and bust cycles
- the community impacts with the strains of rapid infrastructure development with little long term gain
- and the cultural impacts with the loss of aboriginal self identity

These implications do not even consider the catastrophic implications of any spill along any portion of the project. To claim that this project is in the national interest fails to acknowledge the impacts that will be felt over the length of it. Nor does it acknowledge the wealth of the assets that it will alter and destroy.

The amount of revenue the federal and provincial governments will gain from this project will pale in comparison to the gains made by the energy companies. This project is in the corporations’ interest. As a Canadian population we will sacrifice environment, cultural and economic diversification with this project. We will hold the risk and jeopardize our own existence and our quality of life. The economy will become more dependant upon the export of hydro carbon to the detriment of other industries.

The north west along with other areas have seen the rise and decline of resource industries i.e. fishing and forestry with the resulting decimation of the environment by corporations that is done with poor policy planning, a lack of scrutiny and the blessing of the federal and provincial governments. The consequences to regions, throughout development in this boom and bust climate, have been catastrophic both financially and socially leading to ongoing instability in communities. Governments continue to switch resources and policies as the current resource and its revenue diminish. Management is not based on a sustainable model. Governments cannot be trusted to determine what is in the best interest of the society without looking at the complete picture beyond revenue. Their past record has not been good.

A spill of any size along the pipeline or in the marine environment would be devastating economically, socially and environmentally. From the evidence it has been determined that the science required to clean up a bitumen spill in either fresh water or salt water is not satisfactory nor complete. As a result it has been determined between Enbridge and the federal government that further research needs to take place and will commence once approval. The public interest
demands that the science of clean up be in place prior to approval. If the science not currently available the project should not be approved.

Marine safety is a significant issue in these proceedings and the need to avoid oil spills, and to reduce the risk of oil spills to acceptable levels is clearly in the public interest. The issue of marine safety and oil spills is one of the primary issues the Board must consider when making its decision on Enbridge’s applications.

In marine safety and oil spills, Enbridge asserts (according to B23-15, TERMPOL 3.15 Adobe page 49) that:

To reduce the frequency of incidents, Northern Gateway will use escort tugs extensively. The effectiveness of escort tug on reducing incidents is based on previous DNV studies (DNV 2002). Typical causes of grounding and collision incidents were studied by DNV to ascertain how an escort tug might help a tanker avoid an incident, or minimize the damage if the incident was to occur.

The tug escort plan for Northern Gateway will be as follows:

All laden tankers will have a close escort tug between the pilot boarding stations at Triple Islands, Browning Entrance and Caamaño Sound and the Kitimat Terminal (Segments 1, 2, 3, 4a, half of 4b, 6 and 7). In addition all laden tankers will have a tethered escort tug between Browning Entrance and Caamaño Sound and the Kitimat Terminal (i.e., throughout the CCAA, Segments 1, 2, 3, 6 and 7).

All tankers in ballast will have a close escort tug between the pilot boarding stations at Triple Islands, Browning Entrance and Caamaño Sound and the Kitimat Terminal (Segments 1, 2, 3, 4a, half of 4b, 6 and 7).

The predicted effect on lowering the frequency of incidents is provided in Table 4-7. In total this gives a reduction of the total incident frequency by some 65%.

However there is a lack of data and research to support the significant claims of mitigation such as the use of tugs ie the reduction of the total incident frequency by some 65%. In the technical data report of the Marine Shipping Quantitative Risk Analysis pg 5-69 it states that “Tug escort is the only risk mitigation measure of marine tanker transportation that is quantitatively examined in this QRA.”

If this is the assertion, the data presented supporting the claims of the tug effectiveness, is limited and non existent (as it is confidential) and therefore does not meet the criteria and rigor for quantitative examination. The data was not peer reviewed by a 3rd party (April 4th transcript, line 4444 & 4445), there was no data base demonstrating the effectiveness of tugs (i.e. near misses) (April 4th transcript, line 4245) nor were up to date best practices implemented within the QRA.

During cross examination it became clear that the figures utilized in the QRA had limited research backing, peer review or history of tug effectiveness. Enbridge in cross examination dismissed the lack of data and minimized the lack of integrity of their data. They then tried to substantiate their logic and rational of the tugs by stating other studies supported their assertion.
but none of these studies were submitted as evidence. Also best practices had not been adopted for QRA development though the tools and documentation that had been available since 2002. Discussion of the human element in risk analysis had been limited to the inherent “coarse” analysis within the Fairplay data base even though more extensive assessment had been encouraged in best practices and tools were available.

Proponents should not be relied on to provide data to back up their assertions as it is a conflict of interest. If data is presented by the proponent it needs to be third party and peer reviewed. This is what scientific rigor requires.

The assertion of the marine reduction of risk by escort tugs is the key point of the Enbridge Marine portion of safety. It underpins the entirety of Enbridge’s position on marine safety in the Douglas Channel. From this assertion Enbridge has tried to build the social license to proceed with this project. The proponent must earn public respect and trust. The marine component is of the highest concerns of the public and this lack of data as well as concealed ie confidential evidence, does not build public trust or confidence. Also the issue of marine safety and oil spills is one of the primary issues the Board must consider when making its decision on Enbridge’s applications. The evidence supporting the main assertion by Enbridge is flawed and therefore the application should be denied.

The marine portion is not the responsibility of Enbridge. By putting forth commitments for the marine portion Enbridge has sought to build confidence for the public in the marine shipping component. This is done to the degree that Enbridge testified that a complete cost analysis has not been done of the use of tugs for the project though the cost was a “very expensive solution” (April 4th transcript, line 4589). Enbridge states “…the risk mitigation that should promise (i.e. tugs) in this particular project, Northern Gateway was prepared to adopt those without investigating costs, so there was no need to proceed with a cost benefit analysis.” (April 4th transcript, line 4895).

The current government TERMPOL Review endorsed the industry driven TERMPOL and has stated that the current marine situation is fine for the use of VLCC’s and other traffic. It states that the commitments presented by Northern Gateway are good but not mandatory. It is also stated that the route is fine without the use of tugs. Why then is Enbridge stating their commitment as they have? Is their desperation for social license that great?

Enbridge remained steadfast in its assertion that their commitment of tugs would continue through out the life of the project (line 4974). However they would not state that they would continue to ensure the effectiveness of the tugs to remain at 65%.

Between the federal government stating that the marine portion is safe as it is and Enbridge stating they are paying for the mitigating escort tugs no matter what the cost, the question then becomes how valid is the commitment of Enbridge. The weakness of the evidence of the tug effectiveness and the limitations of the QRA around human risk factors and assessment of overall risk is not reassuring for citizens. The risks remain unacceptable.

Based on Enbridge’s purported risk assessment results, the Board should give little or no weight to Enbridge’s submission with respect to marine safety and the risk of oil spills in Douglas Channel. Given the importance of these issues in determining whether the proposed project is in the Public Interest, I submit that the Board will have no alternative other than denying Enbridge’s applications.
At no time does Northern Gateway address what is determined acceptable risk. Two parallel processes occurred with one being the probability of an accident and the other the effects and consequences. At no time do these two processes meet to determine what society and individuals consider as to what is acceptable risk for this project. Was not the JRP process there to facilitate this? When was the discussion promoted to determine the acceptable risk? Instead it was an adversarial process of the proponent trying to limit its exposure to risk. It was well summarized by the Northern gateway panel (line 4797)

**MR. KEITH MICHEL:** Northern Gateway did not attempt to define what was intolerable. Northern Gateway performed the quantitative risk assessment and lowered the risk as low as reasonably practicable. It's Northern Gateway's belief that it is a very safe transportation system. But, ultimately, the decision on whether the Project is acceptable rests with the government, not with Northern Gateway.

When does the acceptability of risk get a public review.

Bill C-38 has jeopardized the public involvement of the process and as intervenors there is a lack of confidence in the process. Federal government introduced legislation in the process that changed the intent of the participation of the intervenors. As intervenors we entered this process in good faith. In introducing Bill C-8 the government shifted the final decision making on environmental reviews to the Cabinet that retroactively applied to the Northern Gateway Joint review process. The Federal government has already publicly endorsed the project and the Canadian Environmental Assessment act concealed in Bill C-38 reduces the authority of the Joint Review Panel to now making a recommendation that the that Federal Cabinet can now overrule.

Within this context it has been difficult for intervenors to proceed in this process. Credibility has been an issue such as the credibility in the effectiveness of scrutinizing the marine portion of the project. As Enbridge said in evidence, the government will determine the acceptable risk. The government has endorsed the marine safety through the TERMPOL QRA Review with little or no concerns. The JRP panel has sat politely through the marine evidence but have little input into the process. The statement of the marine conditions as presented by Enbridge is testimony to this. The fact that no recommendations are made by the JRP regarding the marine portion demonstrates the futility of the exercise that as intervenors we under took with in the Marine component. The federal government has always been the other proponent within this project with all the power.

The scope of the JRP’s scrutiny and decision was to include the marine component. This did not happen and as a result the process should be halted and either redefined or the project denied due to inadequate faulty process.

There has been economic unfairness in the proponent funding in relation to the degree of money that the proponent has been prepared to spend. The large disparity needs to be rectified in other process. For this process it has produced an unfairness that has jeopardized the integrity of the process. The lack of ability of legal consult has resulted in jurisdictional decisions by the NEB that have limited or denied relevant evidence. From my perspective it has compromised the process to the degree that the application should be denied.
As for additional conditions,

- Ask the federal government for the marine commitments to be legislated as mandatory for marine shipping on the coast.

- Greater public involvement is required beyond the mandate of the Enbridge community advisory board. Independent committees (financed with mandatory industry funding) are required for the land and marine portions of the pipeline that have the ability to independently scrutinize, make recommendations and set guidelines from which industry operates eg a committee of the Port of Kitimat. The committees need to be broad based to allow for all interests such as industry, land owners, recreationists, environmentalists, business etc. and need to be consensus driven.

Cheryl Brown, Lakelse Lake B.C
Opinions of Douglas Channel Watch member David G McRae

I firmly believe that the northern gateway project, as proposed, is NOT in the best public interest! The shipping of highly toxic condensate across oceans and back and forth across 1100 k of pipelines is a great waste of energy and disrespectful of a soon to be precious energy used to transport it. Not to mention the expanded carbon footprint it entails. The use of condensate in this manner is disgraceful and serves only to maximize profit for the proponent at the expense of the people and the environment when there is a release. The project is neither in the best public economic interest, or best environmental interest because of this condensate issue alone! I urge the JRP to deny the project.

I hesitate to go here, but should approval be granted, there are additional conditions that need to be added to the JRP’s list of 199 conditions of approval.

1 That watchdog groups be formed from within the public sector and adequately trained in safety and allowed to attend, witness and record pertinent data at all spill or release sites along the pipeline route. These trained groups would require immunity to the pipeline trespass requirements and/or eviction by northern gateway while they are doing their task of recording spill data.

2 Meaningful, long term health studies be made on all persons exposed to toxic materials resulting from a spill or release of product from the northern gateway pipeline project and/or marine tanker spill or release.

3 Kitimat water supply? According to northern gateway, a spill into the Kitimat river would result in the shutting down of the kitimat water station supply pumps for an indefinite period of time. Leaving the town without adequate fire protection or water to flush toilets, not to mention potable water for every day needs would be a complete disaster for all. Supplying bottled water would not come close to meeting the needs of the town. The hospital could not function safely. In view of all this, the proponents should make ready a workable plan for them to relocate, at their expense, our town water supply to an uncontaminated source such as the upper Hirsh creek area as part of the conditions of approval.

4 Pipeline abandonment?? Conditions of approval must also address the associated expenses and hazards of the end of life and/or pipeline abandonment, no matter who ends up being the final owner of the northern gateway pipelines!! Without sufficient funds set aside for this inevitable event the taxpayer may be left holding a very expensive bag. The need to avoid a Giant Mines disaster like they have in Yellowknife is of utmost importance. Maybe a large bond might help. Two billion dollars might be a start.

Dave McRae, Kitimat
Opinions of Douglas Channel Watch member Per Norman

I don't think NGP should be built. 6 billion can be spent on better things. Canada will be better off in the long run if the Alberta oil sands exploitations are scaled down. Canadians will start sooner to adapt to the reality of more costly fossil fuel, and less of it, and will become more innovative in building the economy of the future, something all countries will have to tackle in due time.

Canada can't hope to supply the world with fuels at rates they have been consumed lest we turn precious wilderness in BC and Alberta into wastelands. No thinking and caring person would agree with this.

It's not only the question of oil spills from but the entire oil sands future that should be considered in approving or rejecting this project?

Furthermore, who benefits from the oil sands activity? Could it be that a large part of the wealth generated (maybe most) goes to foreign investors? Are we losing control over our country? And last it is imperative we take effective action about this pesky problem of global warming. Reducing bitumen mining, upgrading and consequent combustion will go a long way.

The Northern Gateway Pipelines is a bad idea. It is out of line with the course Canada should be taking.

Per Norman, Kitimat