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August 10, 2011

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Dear Sir/Madam:

Re: Enbridge Northern Gateway Project Joint Review Panel (OH-4-2011)
File No. OF-Fac-Oil-N304-2010-01 01
Living Oceans Society, Raincoast Conservation Foundation and ForestEthics: Information Request No. 1

Please find attached Information Request No. 1 and attached Schedules submitted jointly by the Living Oceans Society, Raincoast Conservation Foundation and Forest Ethics with respect to the above referenced matter.

Please contact me if you have any questions or require any additional information with respect to this Information Request.

Sincerely,

Barry Robinson

Barry Robinson
Staff Lawyer

Cc: Secretary, Joint Review Panel

Attachments

Northern Gateway Pipelines Limited Partnership
Enbridge Northern Gateway Project
NEB File OF-Fac-Oil-N304-2010-01 01
Filed 27 May 2010

Information Request No. 1
from Living Oceans Society, Raincoast Conservation Foundation
and ForestEthics

1.1 Energy to Puncture Double Hull

Reference:

i. Exhibit B23-34 – TERMPOL TDR – Marine Shipping Quantitative Risk Analysis – A1Z6L8 , Section 3.1.1.3, Traffic Summary – Common Segments, page 3-16 (Adobe page 27 of 151)

Preamble:

At reference i) it is stated:

> The majority of vessels, when operating at normal speeds, will have potential collision energy less than what is required to penetrate the outer hull of a double hull tanker.

The collision energy required to penetrate the outer hull of a double hull tanker is not defined.

Request:

a) Please specify the collision energy required to puncture the outer hull of a double hull tanker (including speed and size of vessel).
b) Please specify the collision energy required to puncture the inner hull of a double hull tanker (including speed and size of vessel).

1.2 Escort for Ballast Tankers

Reference:

i. Exhibit B3-24 – Vol 8A – Gateway Application – Overview and General Information – Marine Transportation (Part 2 of 3) – A1T0H4 , Section 4.2.10.2 Escort Tug Services, page 4-29 (Adobe page 29 of 92)
ii. Exhibit B23-23 – Appendix D1 – TERMPOL TDR – Manoeuvring Study of Escorted Tankers Part 2 Main Report (FORCE Technology) (Part 1 of 2) A1Z6K7
iii. Exhibit B23-24 – Appendix D1 – TERMPOL TDR – Manoeuvring Study of Escorted Tankers Part 2 Main Report (FORCE Technology) (Part 2 of 2) A1Z6K8

Preamble:

At reference i) Enbridge states:

> A close escort tug will be used for all laden and ballasted tankers beginning at the pilot boarding stations (Triple Island and proposed sites in Browning Passage and Caamaño Sound) to and from the marine terminal. The close escort tug will normally be positioned approximately 500 m astern of the tanker, or as directed by the shipmaster or pilot during the transit.
>
> A tethered tug, in addition to a close escort tug, will be used for all laden tankers in the CCAA. The tug will be tethered to the stern of the laden tanker at all times, ready to assist with steering or slowing down.

References ii) and iii) include all of the simulations run from 2007, 2008 and 2009. Among the simulations are numerous runs that involved ballast tankers with a tethered escort tug where tugs were used to assist with steering (e.g. 2008-101, 2008-102-2, 2008-201, etc.); yet , reference i) indicates that ballast tankers will not have a tethered escort.

Request:

a) Please clarify why numerous ballast tankers in the simulations had tethered escorts which were used to assist with steering and whether tethered tugs will be required for all ballast tankers.

1.3 High-current Watercourse Booms

Reference:

i. Exhibit B21-2 – General Oil Spill Response Plan – Enbridge Northern Gateway (March 2011) – A1Y3Y8, Section 8.4, Containment, Table 8-1 Boom Selection Matrix, page 8-7 (Adobe page 81 of 117)

Preamble:

At reference i), Enbridge includes a table which compares four basic boom types with ratings under various operational criteria. For the High Current (>0.5 m/s [1 knot]) section under Environmental Criteria, a footnote is included with the following statement: "Specially designed high-current watercourse booms may be available."

There is no indication that specially designed high-current watercourse booms are actually commercially available.

Request:

a) Please specify whether specially designed high-current watercourse booms are actually commercially available. Please include the model and manufacturer.

1.4 Laden or Ballast Transits

Reference:

i. Exhibit B3-26 – Vol 8B – Gateway Application – Marine Transportation ESA (Part 1 of 11) – A1T0H6 , Section 2.5, Assumptions for the ESA page 2-9 (Adobe page 29 of 123)
ii. Exhibit B3-26 – Vol 8B – Gateway Application – Marine Transportation ESA (Part 1 of 11) – A1T0H6, Section 2.3, Oil and Condensate Tanker Specifications and Traffic, page 2-2 (Adobe page 22 of 123)

Preamble:

At reference i) Enbridge states:

> Approximately 190 to 250 tanker calls (380 to 500 transits per year) will be made to the Kitimat Terminal, consisting of approximately 70 calls by condensate

> tankers and 150 calls by oil tankers (i.e., an average of 220 tanker calls per year). A preliminary estimate of the breakdown by vessel class is 50 VLCC, 120 Suezmax and 50 Aframax (see Table 2-2). These 440 transits per year translate into approximately 1.2 transits per day in the CCAA.

Table 2-2 is available at reference ii).

It is assumed that incoming oil tankers will be ballasted with seawater and outbound oil tankers will be laden with oil from the Kitimat Terminal.

The converse is assumed for condensate tankers. Incoming condensate tankers will be laden and then ballasted on the outbound voyage.

It is unclear whether any of the tankers will be used for both condensate and oil transportation.

It is also unclear whether any of the inbound oil tankers will be partially loaded from another terminal.

Partially-loaded tankers and/or tankers with a change of product increase spill risk factors opposed to in- or outbound tankers in ballast.

Request:

a) Please specify whether incoming oil tankers will ever be partially loaded.
b) Please specify whether all condensate tankers will be in ballast once outbound or if they will be used for oil export from the Kitimat Terminal.

1.5 Limit of Financial Liability at Marine Terminal

Reference:

i. Exhibit B3-22 - Vol 7C – Gateway Application – Risk Assessment and Management of Spills – Kitimat (Part 1 of 1) – A1T0H2, Section 5.9 Financial Responsibility, page 5-15 (Adobe page 43 of 194)
ii. Exhibit B3-22 - Vol 7C – Gateway Application – Risk Assessment and Management of Spills – Kitimat (Part 1 of 1) – A1T0H2, Section 5.9.3 Ship Owner Liability, page 5-16 (Adobe page 44 of 194)

Preamble:

At reference i), Enbridge states:

> The RP [Responsible Party] for a spill from the marine terminal will be Northern Gateway, who will initiate, manage and implement the response operation. Northern Gateway will pay for the response and claims, and then claim these costs from the insurance coverage.
>
> The ship owner is the RP for a spill from a tanker moving to or from the marine terminal or from an escort or harbour tug.

At reference ii), the limit of financial liability for a ship owner is explained as follows:

> The MLA [Marine Liability Act] and CLC [Civil Liability Convention] set limits on the liability of a ship owner depending on the weight of the ship. Liability and compensation for marine oil spills is stated in special drawing rights (SDR). The value of the SDR in Canadian dollars changes each day. Ships greater than 140,000 tonnes are liable for up to 89.8 million SDR (CAN$152.2 million on October 1, 2009). So that the ship owner is able to cover its liability costs, the ship owner must establish a fund in the amount of its maximum liability. Ship owners are required to carry insurance, which is ordinarily provided by international Protection and Indemnity Clubs who provide coverage to ship owners against third-party liabilities relating to the use and operations of ships.

No such description is given for the limit of financial liability for a spill from the marine terminal.

Request:

a) Please confirm that the tanker owner would be the Responsible Party for a spill from an escort or harbor tug (as stated in reference i)), and please confirm that the liability limits for the tanker apply to a spill from an escort harbor tug.
b) Please provide a description, similar to that at reference ii), of the limit of liability for Northern Gateway for a spill from the marine terminal (i.e. relevant acts or conventions, the maximum amount payable by the RP, the amount of insurance Northern Gateway will be required to hold, and where, and how much, additional funds beyond the limit of liability are available).

1.6 Majority of Tankers Serving West Coast U.S.

Reference:

i. Exhibit B1-2 - Vol 1 – Gateway Application – Overview and General Information (Part 1 of 2) – A1S9X5, Section 1.2 Purpose of Project, page 1-3 (Adobe page 15 of 44)
ii. Exhibit B3-26 - Vol 8B – Gateway Application – Marine Transportation ESA (Part 1 of 11) – A1T0H6 , Section 2.5 Assumptions for the ESA, page 2-8 (Adobe page 28 of 123)
iii. Exhibit B3-26 - Vol 8B – Gateway Application – Marine Transportation ESA (Part 1 of 11) – A1T0H6 , Section 2.4.1 Oil and Condensate Tankers, page 2-5 (Adobe 25 of 123)
iv. Exhibit B3-26 - Vol 8B – Gateway Application – Marine Transportation ESA (Part 1 of 11) – A1T0H6 , Section 2.4.1 Oil and Condensate Tankers, page 2-3 (Adobe 23 of 123)

Preamble:

At reference i) Enbridge states:

> The primary purpose of the Project is to provide access for Canadian oil to large and growing international markets, comprising existing and future refiners in Asia and the United States West Coast.

At reference ii) Enbridge states:

> Approximately 33% of the tankers will take the Northern Approach (through Browning Entrance), 13% will take the Southern Approach (through Browning Entrance) and 54% will take the other Southern Approach (through Caamaño Sound).

At reference iii) Enbridge states:

> Tankers arriving from or departing to west coast ports south of Kitimat will follow either of two Southern Approaches.

At reference iv) Enbridge states:

> Tankers arriving from or departing to Asian ports will use the Northern Approach, which passes the Haida Gwaii through Dixon Entrance, and continues through Hecate Strait, Browning Entrance, Principe Channel, Nepean Sound, Otter Channel, Squally Channel, Lewis Passage, Wright Sounds and Douglas Channel to the Kitimat Terminal.

Given the above information, it can be deduced that the 67% of tankers taking one of the Southern Approaches will be arriving from or departing to west coast ports south of Kitimat in the United States.

Request:

a) Please confirm that the majority of tankers servicing the Northern Gateway Pipeline Project will be used to provide access for Canadian oil to the west coast of the United States.
b) Please specify which west coast ports south of Kitimat will be serviced by the tankers from the Northern Gateway Pipelines Project.

1.7 Manoeuvring Studies – Towing Rope and Weather Conditions

Reference:

i. Exhibit B23-18 – TERMPOL TDR – Manoeuvring Study of Escorted Tankers to and from Kitimat Part 1 Executive Summary (FORCE Technology) – A1Z6K2, Section 4.2 Navigational routes, page 44 (Adobe page 47 of 64)

Preamble:

At reference i) a stated outcome for Run No. 203A was:

> The fibre towing rope might part in these weather conditions, especially if used for a longer time under full power and with significant wave heights of 4 metres. Tension winch is needed. Weather conditions were outside the normal transit conditions. It took about 20 minutes to slow down, control and start towing the tanker stern wise.

Weather conditions were a SE ebb current of 2.0 knots, 40 knot wind, 4 metre 11 second waves and good visibility.

Normal transit conditions are not defined.

Request:

a) Please provide a list of all weather conditions when a towing rope might part.
b) Please provide an analysis from long-term records of how often these weather conditions exist in the proposed project area.
c) Please define "normal transit conditions."
d) Please specify the distance travelled in the approximate 20 minute time period which it took for the tanker in Run No. 203A to slow down and start being towed in reverse.

1.8 Manoeuvring Studies – Response Times

Reference:

i. Exhibit B23-18 – TERMPOL TDR – Manoeuvring Study of Escorted Tankers to and from Kitimat Part 1 Executive Summary (FORCE Technology) – A1Z6K2, Section 4.9 Emergency manoeuvres, page 53 (Adobe 56 of 64)

Preamble:

In regards to emergency manoeuvres, at reference i) it is stated:

> The time span from the start of the malfunction to the time where the tug was in position to assist was 1 to 2 minutes.

It is not clear whether the tug escort was tethered to the vessel at the time of the emergency.

Request:

a) Please clarify whether the 1 to 2 minute response time is for a tethered escort tug. If so, what is the estimated response time for a tug escort not tethered to the vessel (e.g. if a ballast tanker experienced a black-out and an escort tug had to be tethered in order to assist)?

1.9 Manoeuvring Studies – Weather Conditions

Reference:

i. Exhibit B23-18 – TERMPOL TDR – Manoeuvring Study of Escorted Tankers to and from Kitimat Part 1 Executive Summary (FORCE Technology) – A1Z6K2, Section 5.3 Approach via Caamaño Sound, page 57 (Adobe 57 of 64)

Preamble :

At reference i) it is stated:

> A concern expressed with the Caamaño Sound approach is that in heavy weather, if an emergency occurs, it may be difficult for an escort tug to hold the tanker or tow it out to sea because of the sea conditions that are experienced in winter months. Consequently, this approach will only be used during moderate weather conditions.

Moderate weather conditions are not defined.

Request:

a) Please define "moderate weather conditions" and conditions which would preclude the use of the Caamaño Sound entrance.
b) Please provide an analysis from long term records of how often non-moderate weather conditions exist in the proposed project area and safe passage through Caamaño Sound would not be possible.

1.10 Manoeuvring Studies – Poor Visibility

Reference:

i. Exhibit B23-22 - Appendix C – TERMPOL TDR – Manoeuvring Study of Escorted Tankers Part 2 Main Report (FORCE Technology) A1Z6K6
ii. Exhibit B3-35 - Vol 8B – Gateway Application – Marine Transportation ESA (Part 10 of 11) – A1T0I5 , Section 13.5.3 Climate and Oceanographic Factors, page 13-15 (Adobe page 15 of 42)

Preamble:

Reference i) includes the list of simulation runs conducted in 2007, 2008 and 2009. General information is provided including weather conditions and whether the simulation was run during the day or night.

Of the simulations conducted, the majority were performed during the day. All of the simulations included were conducted with “good” visibility whether during the day or night.

At reference ii) Enbridge states:

> The main weather hazards to shipping in the region are sea states caused by strong winds associated with storms, periodic outflow winds in winter, and dense sea fog that occur primarily in the summer season.

Dense fog, which equates to poor visibility, is common and can preclude safe shipping.

It does not appear that any simulations were conducted in conditions of poor visibility.

Request:

a) Please clarify whether simulations were conducted with poor visibility. If not, please conduct and provide the results of simulations with poor visibility both during the day and at night.

1.11 Operational Safety Limits

Reference:

i. Exhibit B3-23 - Vol 8A – Gateway Application – Overview and General Information – Marine Transportation (Part 1 of 3) – A1T0H3 , Section 1.1 Overview of Tanker Operations and Environmental Protection, page 1-1 (Adobe page 13 of 44)
ii. Exhibit B3-35 - Vol 8B – Gateway Application – Marine Transportation ESA (Part 10 of 11) – A1T0I5 , Section 13.5.3 Climate and Oceanographic Factors, page 13-15 (Adobe page 15 of 42)
iii. Exhibit B3-24 – Vol 8A – Gateway Application – Overview and General Information – Marine Transportation (Part 2 of 3) – A1T0H4 , Section 4.2 Route Analysis, Approach Characteristics, and Navigability Survey (T3.5), page 4-15 (Adobe page 15 of 92)

iv. Exhibit B23-18 – TERMPOL TDR – Manoeuvring Study of Escorted Tankers to and from Kitimat Part 1 Executive Summary (FORCE Technology) A1Z6K2, page 42 (Adobe page 45 of 64)

Preamble:

At reference i) Enbridge commits to establish operational safety limits to cover visibility, wind and sea conditions as part of their comprehensive strategy to ensure safe passage of marine vessels. Inclusion of operational safety limits is crucial to adequately assess the viability of safe passage.

At reference ii) Enbridge briefly explains the need for operational safety limits, stating:

> Extremes of temperature, visibility and wind force all have an effect on navigation in the region. The main weather hazards to shipping in the region are sea states caused by strong winds associated with storms, periodic bitterly cold outflow winds in winter, and dense sea fog that occur primarily in the summer season. Operational safety limits will be established to cover visibility, wind and sea conditions.

Defined operational safety limits have not been included in the application.

A few limits have been suggested in the application and associated Technical Data Reports (TDRs), but they are contradictory in nature and not extensively defined.

For example, at reference iii) Enbridge states:

> The findings of the FMBS [Full Mission Bridge Simulations] show that the Northern and Southern Approaches can be safely navigated by tankers of up to VLCC size, within the environmental parameters assessed in the simulation, which assessed operations in wind speeds up to 50 knots, combined with current speeds up to 2 knots.

However, at reference iv) a noted concern with the Caamaño approach is:

> …if an emergency occurs in heavy weather (wind above 40 knots combined with a difficult sea state) it may be difficult for an escort tug to hold the vessel or tow it out to sea due to the heavy swell that can occur in the area.

Additionally at reference iv), page 51 it is noted that “[pilots] felt a safe upper limit of operation would be when the wind speed did not exceed 40 knots.”

Further discrepancy is noted at reference iv), page 43, which states:

> If an emergency occurs in heavy weather (wind above 30 knots combined with a difficult sea state) it may be difficult for an escort tug to hold the vessel or tow her out to sea due to the heavy swell that can occur in the area.

Suggested limits have been documented as 50, 40 and 30 knot winds. Difficult sea state has not been defined. Minimal information has been provided for visibility.

Request:

a) Please provide the operation safety limits established to cover visibility, wind and sea conditions that would preclude safe passage of marine vessels – oil tankers and escort tugs – for the Open Water Area (OWA) and Confined Channel Assessment Area (CCAA).
b) Please provide an analysis from long term records of how often these weather conditions exist in the proposed project area, rendering safe passage impossible.

1.12 Pilot Boarding Station Locations and Use

Reference:

i. Exhibit B3-24 – Vol 8A – Gateway Application – Overview and General Information – Marine Transportation (Part 2 of 3) – A1T0H4 , Section 4.2.14 Pilotage Requirements, page 4-32 (Adobe page 32 of 92)
ii. B3-26 – Vol 8B – Gateway Application – Marine Transportation ESA (Part 1 of 11) – A1T0H6, Section 2.4.1 Oil and Condensate Tankers, page 2-5 (Adobe page 25 of 123)
iii. Pacific Pilotage Authority, "Pine Island to Northern Ports 2009 to present," attached as Schedule A

Preamble:

At reference i) Enbridge states:

> At present, there are three pilot boarding stations on the northwest coast of British Columbia that could potentially be used for tankers transiting to the Kitimat Terminal:
> - Triple Island pilot boarding station, situated west of Prince Rupert at the northern reach of Hecate Strait. Triple Island is currently the most active of the northern pilot boarding stations serving deep-sea traffic in the Kitimat region.
> - Pine Island boarding station, situated north of Vancouver Island in Gordon Channel at the entrance to Queen Charlotte Strait.

- The Cape Beale pilot boarding station, situated on southwestern Vancouver Island in Barclay Sound. Cape Beale pilot boarding station is currently used in a limited capacity and typically during summer months only. The Cape Beale station and the Pine Island station near Port Hardy are not considered suitable for tankers calling at the Kitimat Terminal because the stations are too far from the Northern and Southern Approaches.

The Pine Island station is not considered suitable for the tankers servicing the Northern Gateway terminal, but they are not explicitly excluded from potential use. Since 2009 (and likely earlier), the Pine Island station has been used for vessels servicing the Kitimat Alcan, Kitimat Eurocan and Kitimat Methanex terminals (see reference iii, attached as Schedule A). It is not outside the realm of possibility that Pine Island would be used for the Northern Gateway terminal.

The use of the Pine Island station would bring crude oil and condensate tankers in close proximity to Northern Vancouver Island as well as the Central Coast. Risk assessments and route navigability studies have not been conducted for this area for project-related vessels (which are significantly larger than those currently utilizing the Pine Island station).

At reference ii) Enbridge states:

> It is assumed that alternative boarding stations will be designated by the Pacific Pilotage Authority to allow a pilot to board approximately 12 nautical miles seaward of Caamaño Sound or north of Browning Entrance.

At reference i), page 4-32 Enbridge states:

> The Pacific Pilotage Authority, in consultation with the BCCP and shipping stakeholders, will assess the requirements for establishing new pilot boarding stations at suitable locations along the Northern and Southern Approaches and size of vessels and frequency of calls being needed for the Project and other projects proposed for the region.

Further discussion on the status of alternative boarding station designations has not been included.

Request:

a) Please confirm that the Pine Island boarding station will never be used for tankers destined for the Northern Gateway terminal at Kitimat or provide risk assessments and route navigability studies for this route.
b) Please specify whether the Pacific Pilotage Authority has assessed the requirements for establishing new pilot boarding stations at suitable locations along the Northern and Southern Approaches.
c) If so, please submit the assessment as well as the specifications of the new pilot boarding stations (e.g. coordinates, environmental and operational restrictions, etc.).

1.13 Places of Refuge Contingency Plan

Reference:

i. Exhibit B21-2 – General Oil Spill Response Plan – Enbridge Northern Gateway (March 2011) – A1Y3Y8, Section 4.7.3 Places of Refuge, page 4-8 (Adobe page 54 of 116)

Preamble:

At reference i) Enbridge states:

> In July 2007, Transport Canada released its Places of Refuge Contingency Plan to comply with IMO Resolution A.949 (23) Guidelines for Places of Refuge for Ships in Need of Assistance. This new Canadian initiative requires information to be gathered on potential places of refuge (Places of Refuge Contingency Plan) in advance of any incident involving a ship requesting a place of refuge. The Places of Refuge Contingency Plan will be developed for the marine transportation routes, and includes guidance for collecting such information.

Status of the Northern Gateway Project Places of Refuge Contingency Plan has not been included.

Request:

a) Please provide a copy of the Transport Canada Places of Refuge Contingency Plan.
b) Please provide a copy of the Northern Gateway Project Places of Refuge Contingency Plan or advise as to the estimated completion date for the Contingency Plan.

1.14 Properties and Fate of Hydrocarbons – Exclusion of CLB

Reference:

i. Exhibit B16-31 – Properties and Fate from Spills at CCAA TDR Part (1 of 1) – A1V8F9, Section 4.2 General Fate of the Three Oils, page 4-4 (Adobe page 40 of 132)
ii. Exhibit B16-32 – Properties and Fate from Spills at OWA TDR Part (1 of 1) – A1V8G0

Preamble:

At reference i) it is stated:

> Preliminary modelling has shown that the two diluted bitumen oils (CLB and MKH) exhibit a similar long-term fate so only one of these oils, MKH, was included in the final detailed assessment.

Cold Lake Bitumen (CLB) was not included in the detailed assessment for the above reason. Yet, nearly every single field (except one) in the Spill-Related Properties of Cold Lake Bitumen Diluted with Condensate table (Table 3-3) and the Spill-Related Properties of MacKay Heavy Bitumen Diluted with Synthetic Light Oil table (Table 3-4) from Reference 1 is different. The only similar value is the Emulsion Formation Tendency and Stability at 15^{o}C from the tables (except the CLB table used 14^{o}C), which was valued "Very Likely" for the Tendency Index, "Meso-stable" for the Stability Index, and 53% for Water Content. All of the additional spill-related properties are different.

CLB is also not included in the assessments of reference ii).

Because the spill-related properties are not exactly the same, CLB should be included in the final detailed assessments for both the CCAA and OWA if it a product proposed for shipment with the Northern Gateway project.

Request:

a) Please confirm that Cold Lake Bitumen (CLB) will be modelled in the final detailed assessments for both the CCAA and OWA.

1.15 Rabaska 2004 report

Reference:

i. Exhibit B23-34 - TERMPOL TDR - Marine Shipping Quantitative Risk Analysis - A1Z6L8 , Section 2 Methodology, page 2-7 (Adobe page 19 of 151)
ii. Exhibit B23-34 - TERMPOL TDR - Marine Shipping Quantitative Risk Analysis - A1Z6L8 , Section 5.1.2 Assumptions on Sailing Time Relevant to Incidents, page 5-51 (Adobe page 63 of 151)

Preamble:

In reference i), the below report was referenced as a basis for using the “Per Voyage Methodology” to complete the analysis.

- RABASKA, Projet de terminal méthanier, Processus d’examen TERMPOL Étude 3.15, Analyse des risques et méthodes visant à réduire les risques

Additionally, at reference ii), the Rabaska 2004 report was used for crucial damage statistics used in the calculations for tanker incident frequencies per nautical mile. The Rabaska 2004 report is therefore the source of one of the most important assumptions underlying the return period calculations in the QRA.

The Rabaska 2004 is not easily accessible and is needed to adequately review the assumptions included in the QRA.

Request:

a) Please provide the English version of the following report: RABASKA, Projet de terminal méthanier, Processus d’examen TERMPOL Étude 3.15, Analyse des risques et méthodes visant à réduire les risqué

1.16 Response Capacity for OWA

Reference:

i. Exhibit B3-37 - Vol 8C – Gateway Application – Risk Assessment and Management of Spills – Marine Transportation (Part 1 of 6) – A1T0I7 , Section 5.5 Equipment and Personnel, page 5-11 to 5-13 (Adobe page 43 to 45 of 50)

Preamble:

At reference i) response recommendations for the Confined Channel Assessment Area (CCAA) are discussed. These include:

- Estimated response times of 6 to 12 hours on water, page 5-11
- An overview of the Oil Spill Response Plan (OSRP) equipment envisioned for the CCAA as described in Table 5-3, page 5-12
- Proposed hydrocarbon recovery capability throughout the CCAA as described in Table 5-4, page 5-13.

At page 5-13 Enbridge also states:

> Further planning is in progress to determine the response recommendations for the OWA.

Response recommendations for the OWA are not included in the EIS.

Request:

a) Please provide response recommendations for the Open Water Area (OWA) including:
   - Estimated on-water response times
   - A table of the OSRP equipment envisioned for the OWA
   - A table of the proposed hydrocarbon recovery capability for the OWA

1.17 Route for Condensate Tankers

Reference:

i. Exhibit B1-2 – Vol 1 – Gateway Application – Overview and General Information (Part 1 of 2) – A1S9X5, Section 1.2 Purpose of Project, page 1-3 (Adobe page 15 of 44)
ii. Exhibit B3-26 – Vol 8B – Gateway Application – Marine Transportation ESA (Part 1 of 11) – A1T0H6 , Section 2.4.1 Oil and Condensate Tankers, page 2-5 (Adobe 25 of 123)
iii. Exhibit B3-37 – Vol 8C – Gateway Application – Risk Assessment and Management of Spills – Marine Transportation (Part 1 of 6) – A1T0I7 , Section 3 Probability of Hydrocarbon Spills, Table 3-1 Return Period of a Spill Associated

with the Tanker Traffic for the Northern Gateway Project, page 3-4 (Adobe page 26 of 50)

iv. Exhibit B23-34 – TERMPOL TDR – Marine Shipping Quantitative Risk Analysis – A1Z6L8 , Table 7-7 Assumed distribution of ship traffic to and from the Kitimat Terminal, page 7-105 (Adobe page 117 of 151)

Preamble:

At reference i) Enbridge states:

> Condensate will be imported from a variety of supply areas in the Asia-Pacific and Middle East and will be transported to sources of bitumen and heavy oil production for blending purposes.

At reference ii) Enbridge states:

> Tankers arriving from or departing to Asian ports will use the Northern Approach, which passes the Haida Gwaii through Dixon Entrance, and continues through Hecate Strait, Browning Entrance, Principe Channel, Nepean Sound, Otter Channel, Squally Channel, Lewis Passage, Wright Sounds and Douglas Channel to the Kitimat Terminal.

However, at reference iii) Enbridge states:

> Condensate tankers are not forecast to use the Northern Approach.

Reference iv) also excludes condensate tankers from the Northern Approach.

Given the preceding contradictory statements from references ii) to iv), it is unclear which approach the condensate tankers will use.

Request:

a) Please clarify the expected source of condensate and confirm which approach the condensate tankers will use.
b) If condensate tankers are expected to use the Northern Approach, please provide a revised Marine Shipping Quantitative Risk Analysis.

1.18 Tanker Acceptance Program

Reference:

i. Exhibit B3-24 – Vol 8A – Gateway Application – Overview and General Information – Marine Transportation (Part 2 of 3) – A1T0H4 , Section 4.1.4.1 Kitimat Terminal Tanker Acceptance (Vetting) Program, page 4-12 (Adobe page 12 of 92)

ii. Exhibit B3-24 – Vol 8A – Gateway Application – Overview and General Information - Marine Transportation (Part 2 of 3) – A1T0H4 , Section 4.1.4.1 Kitimat Terminal Tanker Acceptance (Vetting) Program, page 4-13 (Adobe page 13 of 92)

Preamble:

At reference i) Enbridge states:

> The Kitimat Terminal will use a Tanker Acceptance Program (TAP) so that the tankers scheduled to berth at the marine terminal will meet the required standards.
>
> Upon the nomination of a tanker to berth at the marine terminal, Northern Gateway will submit the tanker to a TAP. All tankers, regardless of clearances received during previous calls at the marine terminal, will be subject to a TAP, each time they intend to berth. Northern Gateway will not accept the tanker's notice of readiness to berth or request to lay-by at the berth without a TAP clearance.
>
> The TAP for the Project will employ the most current SIRE or an equivalent third party vetting system.

It is unclear whether the TAP process occurs when the vessel intends to berth, before entering the Confined Channel Assessment Area (CCAA), or prior to being chartered for the purpose of serving the terminal.

At reference ii) Enbridge states: "Tankers without a SIRE filed within the previous two years will not be allowed to use the marine terminal under any circumstances."

Aside from the above statement, no criteria for tanker clearance/refusal have been given; rather, Enbridge states: "At the discretion of Northern Gateway, and depending on the responses, the tanker may be cleared for arrival (pg. 4-13)."

Request:

a) Please clarify whether the TAP submission process occurs before the vessel is chartered, before the vessel enters the Confined Channel Assessment Area (CCAA), or once the vessel is in the vicinity of the berth at the Kitimat Terminal.
b) Please submit criteria for vessel refusal under the TAP.
c) Please specify whether the SIRE vetting process includes an on-board physical inspection of e.g. cargo and/or ballast tanks/spaces.

1.19 Tug Escort Study

Reference:

i. Exhibit B3-24 – Vol 8A – Gateway Application – Overview and General Information – Marine Transportation (Part 2 of 3) – A1T0H4, Section 4.2 Route Analysis, Approach Characteristics, and Navigability Survey (T3.5), page 4-14 (Adobe page 14 of 92)
ii. Glosten Associates, "Manoeuvring Simulations," attached as Schedule B

Preamble:

In reference i) Enbridge refers to "a number of studies were previously completed to review the accessibility of Kitimat Arm by large tankers, including VLCCs and LNG carriers (pg. 4-14)." These include:

- December 1976 – TERMPOL studies for the Marine Terminal at Kitimat, B.C., prepared by Kitimat Pipe Line Ltd.
- May 4, 1977 – TERMPOL Assessment of the Kitimat B.C. Marine Oil Terminal Proposal, prepared by the CCG.
- April 21, 2005 – Preliminary Assessment of Tanker Routes into Kitimat, British Columbia Using Simulation, prepared by the Centre for Marine Simulation.
- Three phases of Full Mission Bridge Simulation (FMBS) at the Force Technologies facility in Denmark with assistance from the British Columbia Coast Pilots (2008 and 2009).

An additional navigability study was commissioned by Enbridge from the naval architecture and marine engineering firm The Glosten Associates (http://www.glosten.com/) based in Seattle, Washington. The report is entitled "Study of Tug Escorts for Enbridge Gateway Terminal, Kitimat, British Columbia, Canada Final Report" and was published in December 2006.

As mentioned in reference ii):

> The Glosten Associates are leaders in the use of manoeuvering simulation for safety assessments of ports and harbors with respect to the transport of oil by ship. [They] have analyzed and designed escort practices for oil tankers in Prince William Sound, Puget Sound, San Francisco Bay, Los Angeles/Long Beach, Newfoundland, Hawaii, Asia, and Africa. [They] have worked with the U.S. Coast Guard, oil companies, port authorities, and environmental groups.

The report from The Glosten Associates is not referenced in Enbridge's application.

Request:

a) Please provide a copy of The Glosten Associates report entitled "Study of Tug Escorts for Enbridge Gateway Terminal, Kitimat, British Columbia, Canada Final Report."

1.20 Worst-case Scenario Spill

Reference:

i. Exhibit B23-34 – TERMPOL TDR – Marine Shipping Quantitative Risk Analysis – A1Z6L8, Section 6.3 Conditional Probability of a Spill from Incidents Occurring during Transits to and from the Marine Terminal, page 6-78 (Adobe page 90 of 151)
ii. Exhibit B23-15 – TERMPOL Surveys and Studies – Section 3.15 – General Risk Analysis and Intended Methods of Reducing Risk – A1Z6J9 , Section 12 Mass Balance Examples for Response Planning, page 12-5 (Adobe page 215 of 388)
iii. B3-42 – Vol 8C – Gateway Application – Risk Assessment and Management of Spills – Marine Transportation (Part 6 of 6) – A1T0J2, Section 10.4 Selection of Mass Balance Examples for the CCAA and OWA, page 10-5 (Adobe page 5 of 176)

Preamble:

At reference i) it is stated:

> TERMPOL requests that the risk of an incident becoming uncontrollable be examined. For the purposes of this QRA, an uncontrollable situation is assumed to be a total loss.

The largest spill in terms of volume included in the Enbridge EIS is 36,000m^3, defined at reference ii) and reference iii) as:

> The Wright Sound example, although highly unlikely, is for 36,000 m^3, which represents the potential volume of oil that might be spilled as a result of a collision between a VLCC and another vessel that results in a breach of the double hull and almost complete drainage of two internal tanks.

An example of an uncontrollable incident, represented as a total loss of cargo, is not included in the mass balance examples in the EIS.

Request:

a) Please provide a mass balance example for a worst-case scenario oil spill, meaning a total loss of cargo.

1.21 Probability of Oil Spills from Pipeline

References:

i. Exhibit B3-20 – Vol 7B – Risk Assessment and Management of Spills – Pipelines (Part 1 of 2) – A1T0H0, Section 3 Probability of Hydrocarbon Spills, page 3-1 to 3-3 (Adobe page 19 to 21 of 78)

Preamble:

The spill return periods in Table 3-2 for each physiographic region appear to be simple arithmetic functions of the pipeline length in each region. No allowance appears to have been made for whether the physiographic region contains a higher proportion of high risk terrain or is more subject to avalanches, landslides or seismic activity. No spill return period is specified for the entire pipeline or for the oil and condensate pipelines considered together. The reference indicates that "the estimated probability of hydrocarbons reaching a watercourse is less than the probability of a release at any particular location". However, the reference does not provide any probability of a spill reaching a watercourse or other sensitive terrain. Table 3-3 does not indicate the length of pipeline associated with each year's data.

Request:

a) Please confirm that the return period for a medium spill for the entire pipeline length, based on the arithmetic formula used in Table 3-2, is 40.65 years.
b) Please confirm that the return period for a large spill for the entire pipeline length, based on the arithmetic formula used in Table 3-2, is 94.75 years.
c) Please confirm that the return period for spills when considering the entire pipeline length and the presence of two pipelines will be half of that for one pipeline, namely 20.33 years for a medium spill and 47.38 years for a large spill.

d) Please provide an adjustment to the spill risk and return period for each physiographic region in Table 3-2 to account for the quantity of high risk terrain (avalanches, landslide, seismic risk) in each region.
e) Please update Table 3-3 to include Enbridge's oil spills in 2010.
f) In Table 3-3, please indicate the number of kilometers of pipeline associated with each year's data.
g) In Table 3-3, please indicate for each year, the number of spills into watercourses or sensitive terrain.

1.22 Pipeline Risk Assessment

References:

i. B1-10 – Vol 3 – Gateway Application – Engineering, Construction and Operations (Part 6 of 19) – Appendix E, Report E-1 – A1S9Y3, Section 4.2.6 Limitations of the Risk Assessment, page 42 (Adobe page 52 of 74)
ii. B1-10 – Vol 3 – Gateway Application – Engineering, Construction and Operations (Part 6 of 19) – Appendix E, Report E-1 – A1S9Y3, Section 4.2.3 Hazards probabilities, page 39 (Adobe page 49 of 74)

Preamble:

Reference i) states that "combined events where progressive failures could occur were not assessed as hazards but were evaluated as isolated occurrences." Despite being not assessed, co-occurrence of events is possible. For instance, a snowstorm could create conditions for an avalanche or a landslide that ruptures the pipeline, and could also prevent emergency response crews from responding.

In reference i) AMEC, the consulting firm hired to conduct the project's risk assessment, said that in a more rigorous risk evaluation non-linearity could be considered and might actually change the outcomes of the risk assessment.

Reference i) also states that neighbouring pipelines were not included in the risk assessment.

Reference ii) indicates that hazards located outside of the 1 km right of way are not included in the risk analysis. There are likely hazardous areas outside of the 1 km right of way that will increase the risk within and along the right of way, such as abutting unstable slopes, soils or floodplains.

Request:

a) Please provide a risk analysis that shows the likelihood and consequence of combined (co-occurring) events where progressive failures could occur.
b) Please provide a risk evaluation that considers non-linearity in the assessment of consequence and likelihood.
c) Please provide a risk analysis that includes the consequences of having other, neighbouring pipelines nearby. In particular, the impact of having an oil and condensate pipeline operating in close proximity and the potential impact from other existing or planned natural gas pipelines.
d) Please provide a risk analysis which includes all hazards outside of the 1 km right of way which could impact the pipeline.

1.23 Risks to Pipeline from Earthquakes

References:

i. B1-10 – Vol 3 – Gateway Application – Engineering, Construction and Operations (Part 6 of 19) – Appendix E, Report E-1 – A1S9Y3, Section 3.3.1 Geologic Settings, page 26 (Adobe page 36 of 74)
ii. B1-10 – Vol 3 – Gateway Application – Engineering, Construction and Operations (Part 6 of 19) – Appendix E, Report E-1 – A1S9Y3, Section 3.3.3 Natural Hazards due to Seismic Events, page 29 (Adobe page 39 of 74)

Preamble:

Reference i) indicates that the level of ground shaking from a large magnitude event along the Queen Charlotte Fault would be appreciable.

Reference i) also indicates that there is no clear-cut relationship between faults and seismicity and that earthquakes have happened within 60 km of the proposed route within the last 25 years.

Reference ii) states that there have been no failures of major cross country buried welded steel pipelines due to seismic shaking without associated soil movements.

Request:

a) Please quantify the maximum potential size of an earthquake originating along the Queen Charlotte Fault and how that earthquake would impact the marine terminal in Kitimat.
b) Please quantify the likelihood and consequences of earthquakes of varying severity within 300 km along the proposed pipeline route.
c) Please indicate the number of failures of major buried welded steel pipelines in Canada and the U.S. due to seismic shaking with associated soil movements, and the type and amount of petroleum products that spilled as a result of those failures.

1.24 Pipeline Monitoring and Emergency Response

References:

i. B1-5 – Vol 3 – Gateway Application – Engineering, Construction and Operations (Part 1 of 19) – A1S9X8, Section 10.1.4: Construction Infrastructure, page 10-3 (Adobe page 91 of 132)
ii. B20-2 – Northern Gateway Response to Request for Additional Information from the JRP Session Results and Decision (Jan 19, 2011) – A1Y3U9, Section C.2.7, Difficult access to pipeline right of way (terrain and in tunnels) in all seasons, page 30 (Adobe page 34 of 66)
iii. B2-1 – Vol 4 – Gateway Application – Public Consultation (Part 1 of 25) – A1S9Z8, Section 2.5.1 Identification of Stakeholders, page 2-5 (Adobe page 15 of 153)
iv. B1-5 – Vol 3 – Gateway Application – Engineering, Construction and Operations (Part 1 of 19) – A1S9X8, Section 5.1: Tables 5-1 and 5-2, page 5-1 (Adobe page 41 of 132)

Preamble:

Reference i) states that “permanent access roads will be built, on an as-needed basis, to pump stations, valve sites, tunnel portals and environmental response control points.”

Reference ii) provides Enbridge’s response to the JRP’s concern of difficult access to the pipeline right of way in all seasons. Enbridge does not provide any substantive details on when, specifically, winter road clearing, all terrain vehicle and helicopter use and helicopter landing pads will be required.

Reference iii) states the total number of landowners adjacent to or affected by the right of way. There are also additional dispositions granted along the right of way. No estimate is given on the number of land users or residents along the proposed right of way.

Reference iv) states that the oil and condensate pipeline design parameters have a minimum design temperature of -5 C. Temperatures along the pipeline route can drop below – 40 C.

Request:

a) Please provide an access management plan that geographically identifies all needed permanent access roads, pump stations, valve sites, tunnel portals, helicopter landing pads and environmental response control points.
b) Please provide the level and frequency of monitoring for all sections of the pipeline.
c) Please indicate the response time of emergency response crews to all sections along the pipeline, including response times during landslides, avalanches, heavy snowfall, forest fires, power outages and co-occurring events.
d) Please describe the conditions when winter road clearing, all terrain vehicle and helicopter use and helicopter landing pads will be required.
e) Please quantify the total number of individual land users (recreationalists, hunters, trappers, residents, etc.) adjacent to or affected by the pipeline right of way.
f) Please indicate how Enbridge will notify and evacuate those identified in e) if there is accident or malfunction that warrants such action.
g) In the event of an emergency shutdown of the pipeline and the oil and condensate cooling to the ambient air temperature, please explain how the oil and condensate pipelines will not be affected by temperatures colder than their stated design parameters of -5C.

1.25 Climate Adaptation – Ongoing Changes

References:

i. Whitfield, P.H., 2003, “Retrospective and Modelling Recent Changes in Streamflow in Northern BC,” Proceedings of the Adapting to Climate Change in Northern British Columbia Workshop, February 20, 2003, Prince George, B.C, page 18 (Adobe page 21 of 71), http://www.env.gov.bc.ca/cas/pdfs/adapt-wshp-nforest.pdf, attached as Schedule C

ii. Exhibit B1-14 – Vol 3 – Gateway Application – Engineering, Construction and Operations (Part 10 of 19), Appendix E, Report E-1, Table B-1 – A1S9Y7, Km 492.7 to 493.15, page 28 (Adobe page 30 of 93)

iii. DeGeer, D. and Nessim, M., "Arctic Pipeline Design Considerations," Proceedings of the ASME 27th International Conference on Offshore Mechanics and Arctic Engineering, June 15-20, 2008 Estoril, Portugal. OMAE 2008-57802; attached as Schedule D

Preamble:

Reference i) states that modelling on the Upper Fraser and Skeena River has shown a greater seasonal variation in streamflow over time due to climate change. This equates to a greater and earlier spring freshet and a drier summer.

Reference ii) cites an area along the Wapiti River with degrading discontinuous permafrost.

Reference iv) states that a warm pipeline, such as a pipeline shipping diluted bitumen, operating through discontinuous permafrost is at risk of settling from the weight of the overburden and pipe. Thaw settlement may cause uncontrolled pipe deformations leading to leaks or ruptures if there is not adequate monitoring and appropriate action taken to minimize strain on the pipeline.

Request:

a) Please indicate how forecasted changes in streamflow and precipitation along the proposed route, resulting from climate change, are considered in the design and routing of the pipeline.
b) Please explain how pipeline construction, operation and maintenance will accommodate melting discontinuous permafrost and address the risks associated with thaw settlement.

1.26 Climate Adaptation – Increased Risk of Natural Disasters

References:

i. Carroll, Allan L.; Taylor, Steve W.; Regniere, Jacques; and Safranyik, 2003, Les; "Effect of climate change on range expansion by the mountain pine beetle in British Columbia," *The Bark Beetles, Fuels, and Fire Bibliography*, Paper 195, http://digitalcommons.usu.edu/barkbeetles/195, attached as Schedule E

ii. Exhibit B3-11 – Vol 6A P2 – Gateway Application – Pipelines and Tank Terminal ESA (Part 6 of 6) – A1T0G1, Section 14 Effects of the Environment on the Pipelines and Tank Terminal, page 14-17 (Adobe page 113 of 120)

iii. Exhibit B3-11 – Vol 6A P2 – Gateway Application – Pipelines and Tank Terminal ESA (Part 6 of 6) – A1T0G1, Section 14 Effects of the Environment on the Pipelines and Tank Terminal, page 14-2 (Adobe page 98 of 120)

iv. Geertsema, M.; Schwab, J.W.; Blais-Stevens, A. and M.E. Sakais, 2009, “Landslides impacting linear infrastructure in west central British Columbia,” Natural Hazards 48:59-72; attached as Schedule F

Preamble:

Reference i) states that with drier summers and warmer winters the range of the mountain pine beetle will expand along the proposed route of the pipeline and kill large stands of pine trees. These large tracts of dead pine stands are highly susceptible to forest fires.

Reference ii) acknowledges that both mountain pine beetle and climate change may increase the severity of forest fires. Forest fires, in turn, create significant safety issues for pipelines. Forest fires have the ability to disrupt power supply to pump stations, emergency shutdown and leak detection systems and to limit access during the event of a spill.

References iii) and iv) state that wetter springs and winters due to climate change will increase the risk of landslides and avalanches in west central B.C.

Request:

a) Please describe how the anticipated increased incidence of forest fires will impact access to the pipeline right of way, power supply to pumping stations and leak detection systems.
b) Please describe how the anticipated increased incidence of landslides will impact access to the pipeline right of way, power supply to pumping stations and leak detection systems.

1.27 Pipeline Oil Spill Scenarios

References:

i. Management of Spills – Pipelines (Part 1 of 2) – A1T0H1, Section 9 Examples of Hypothetical Spills Along the Pipelines, page 9-1 to 9-29 (Adobe page 1 to 29)

Preamble:

Reference i) provides oil spill scenarios for four locations along the pipeline route. The Reference does not provide the basis for selecting the oil spill scenarios. It would be appropriate to provide additional high-risk oil spill scenarios.

Request:

a) Please provide the methodology used for selecting the four hypothetical spill scenarios.
b) Please provide an oil spill scenario for a large hydrocarbon spill adjacent to the Morice River at KP 1038.
c) Please provide oil spill scenarios for large hydrocarbon spills in the Clore and Hoult tunnels.

1.28 Effects of Decommissioning on Freshwater Fish

References:

i. Exhibit B3-9 – Vol 6A P2 – Gateway Application – Pipelines and Tank Terminal ESA – Part 4 of 6), Section 11, Freshwater Fish and Fish Habitat, page 11-124 (Adobe page 124 of 140)

Preamble:

Reference i) states that "[i]t is expected that the section of pipelines under watercourses will be left in place when the Project is decommissioned."

Request:

a) Please describe the potential impacts of abandoned pipelines on water quality, salmon ecosystems and salmonid populations following decommissioning.

1.29 Commercial Support

References:

i. Exhibit B1-4 – Vol 2 – Gateway Application – Economics, Commercial and Financing (Part 1 of 1) – A1S9X7, Section 2 Commercial Considerations, page 2-1 to 2-2 (Adobe page 25 to 26 of 166)
ii. Exhibit B1-4 – Vol 2 – Gateway Application – Economics, Commercial and Financing (Part 1 of 1) – A1S9X7, Section 1.4 Condensate Supply, page 1-10 to 1-12 (Adobe page 20 to 22 of 166)

Preamble:

Reference i) states that Enbridge has received "substantial commercial support for the Project". However, Enbridge has not documented any agreements with shippers.

Reference ii) identifies the anticipated need for the project to supply condensate to tar sands operators but does not disclose whether supply or purchase contracts have executed by shippers, suppliers or purchasers of condensate.

Request:

a) Please provide a list of shipper agreements that are in place for Northern Gateway for either oil or condensate.