



FRIENDS OF ECOLOGICAL RESERVES
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CANADA

Information Request to TMX from FERs

January, 2015

Mr. D. Scott Stoness
Vice President, Finance & Regulatory Affairs
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Mr. Shawn H. T. Denstedt, Q.C.
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Re: Hearing Order OH-001-2014
Trans Mountain Pipeline ULC
(Trans Mountain) Application for the Trans Mountain Expansion Project (Project)
Information Request No.2 to Trans Mountain

Dear Mr. Stoness and Mr. Denstedt:

Pursuant to the above referenced National Energy Board Hearing Order. Please find below Information Request No. 2 to Trans Mountain, on behalf of the Board of Friends of Ecological Reserves.

Respectfully yours and on behalf of the Board of the Friends of Ecological Reserves (Board of FER).

Mike Fenger
RP Forester
President
Friends of Ecological Reserves

Garry Fletcher
Board member

Cc: Marilyn Lambert (Board member)

There are 17 Ecological Reserves along the tanker route with significant ecological values that are potentially impacted by an oil spill. Ecological Reserves (ERs) are managed by BC Parks and have the highest protection in the BC Parks System. Below are our information requests. Please do not respond to our information requests by referring to an answer provided elsewhere in response to someone else's question. As volunteers we have spent considerable un-reimbursed time needed to research and prepare IRs and do not wish to have to spend significant time to research and understand your responses. There are 32 requests for information and we have provided context for why we seeking this information.

IR2 #	Information Request with context and background
IR2 # 1	<p>Based on the current ecosystem conditions of sensitive areas such as ecological reserves, in the event of an oil spill and attempted cleanup and restoration, what are the criteria that KM proposes to use to declare an area restored and in no further need of investment in restoration activities?</p> <p>Context. Friends of Ecological Reserves hope to see in a response the elements of a practical approach that will be used/supported by KM to restore ecological integrity marine of Ecological Reserves. FER knows that marine ecological reserves are important as reference ecosystems and ER specific knowledge is essential for designing, implementing and monitoring restoration projects and programs pre and post spill. Question 17 is related to question 1 but seeks information on reference ecosystems and indicator monitoring.</p>
IR2 #2	<p>Who has TMX met with in Environment Canada and what has been the outcome with regard to long term monitoring partnerships of ecosystem and species indicators?</p> <p>Context: During the first Information Request July 2014 TMX responded positively with regard to long term monitoring of at least some indicators such as marine birds. <i>“TMX is supportive of a collaborative approach to long-term monitoring for marine birds. As committed in EC P-IR No. 1.19 (provided in GoC EC IR No. 1.001), Trans Mountain will endeavour to meet with Environment Canada to discuss the potential for development of a long-term monitoring program as a partnership with others.</i></p> <p>We are pleased with this potential for cooperative long-term monitoring and know that some monitoring exists from observations associated with Ecological Reserves. There are other high value habitats along the tanker route too. For example we have learned from government biologists that Mandarte Island is a very important seabird colony in the Strait of Georgia. Monitoring during 2014 breeding season noted there were 675 Pelagic Cormorant (<i>Phalacrocorax pelagicus</i>) nests , 322 Double-crested Cormorant (<i>Phalacrocorax auritus</i>) nests and 5 Brandt’s Cormorant (<i>Phalacrocorax penicillatus</i>) nests. If there ever was a spill near Mandarte Island in the summer it would affect about half of the cormorants nesting in the Strait of Georgia. Since populations levels fluctuate natural long term monitoring is needed to know if this was a peak season, average or below average for this colony site.</p>
IR2 #3	<p>What will TMX provide as an incremental improvement over and above existing navigational aids?</p> <p>Context: KM is in agreement and supports recommendation 3 of the TERMPOL</p>

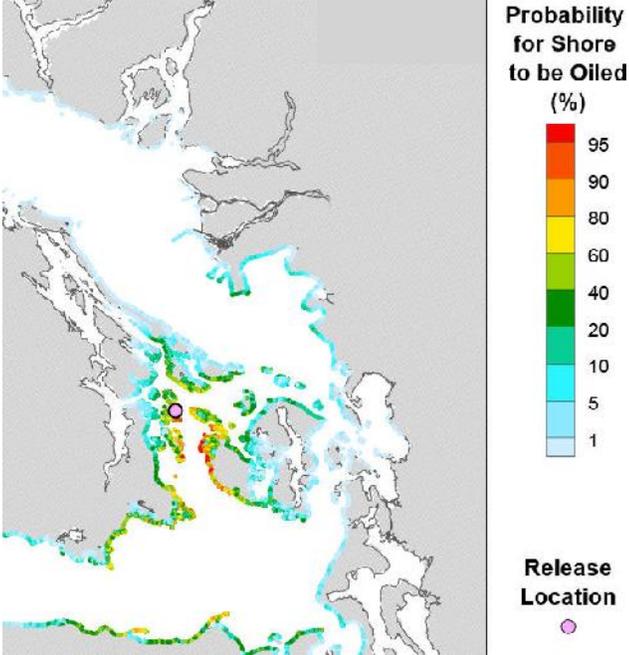
	<p>2014 report which states “<i>Trans Mountain should provide information when requested by the Canadian Coast Guard, to facilitate the Canadian Coast Guard’s evaluation of the proposed additional navigation aids over and above existing navigation aid infrastructure</i>”.</p>
IR2# 4	<p>What is the size/capacity of tankers that will be contracted to move oil from the TMX Westridge terminal? In terms of capacity are they equivalent to or larger than the size/capacity of Aframax tankers used in the oil spill modelling report?</p> <p>Context: The Consultant’s report (B19-14_ _V8B_TR_8B7_01_OF_24_ERA_MAR_SPILL_-_A3S4K7.pdf) provided spill modelling scenarios using what was referred to as a “credible worse case (CWC) spill of 16,500 m³ and a smaller spill of 8,250 m³”. The report states that tankers assumed in this modelling exercise were Aframax tankers with the scenario based on respective loss of two of its cargo tanks (credible worst case scenario) or one of its cargo tanks (small spill). According to the Maritime Connector web site http://maritime-connector.com/wiki/afamax/ an average Aframax tanker can carry 750,000 barrels of oil. One cubic meter of oil is equivalent to 6.3 barrels of oil. So the CWC modelled was for a spill of 103,950 barrels of oil or 4,365,900 gallons or a loss of 14% of capacity of an average sized Aframax tanker as a credible worst case. The Exxon Valdez tanker was carrying in excess of 260,000 barrels of oil and the commonly accepted amount spilled was 260,000 barrels and that is the figure used by the State of Alaska Exxon Valdez Trust Council. Our concern is the amount spilled in this case was significantly greater than 14% of carrying capacity and some percentage greater than 14% is more realistically a CWC scenario. FER is also concerned that future oil spill preparedness will be based on the CWC scenarios. This appears to be too low a percentage of capacity of the tankers that will be contracted by KM in the future.</p>
IR2 #5	<p>In May 2013 KM proposed to increase daily shipping of oil from 300,000 bbl. /days to 890,000 bbl. /day. Given this 300% increase is the CWC which was modelled at 103,950 bbls is still a credible worst case scenario as it represents a spill in which the worst case is 12% of a single day’s production and it is anticipated that larger tankers closer to single days production are more likely to be contracted.</p> <p>Context: The Application for Pipeline Facilities Certificate for the Trans Mountain Expansion Project, May 23, 2013 states “<i>In response to growing market demand and customer contractual commitments, Trans Mountain proposes to expand the existing Trans Mountain Pipeline System by 93,800 m³/d (590,000 bbl./d) from 47,690 m³/d (300,000 bbl./d) to 141,500 m³/d (890,000 bbl./d).</i>”</p>
IR2 #6	<p>Please clarify why the “credible worst case scenario” modelled and referenced above assumes that only a relatively low percent of a medium size tanker capacity is spilled and provide equivalent modelling for informed risk management, using future potentials as has been done in the research from George Washington University, 2013:</p> <p>Context: In the VTRA 20Int 10 – SYNOPSIS OF RMM SCENARIO COMPARISON APPLIED TO CASE T: GW – KM – DP (George Washington University, 2013) , http://www.seas.gwu.edu/~dorpir/VTRA/PSP/CASES/VTRA%202010%20Master%20Comparison%20-%20T%20-%20RMM.pdf</p>

A completely different set of models is presented because they do not follow from historical data but rather consider 2010 as the base Case year and a base case year is evaluated. Following that, What-if scenarios are developed from the base case by adding additional hypothetical traffic (upcoming if major vessel transport projects go ahead) and a “What-if” potential is evaluated and compared relative to the base case to inform risk management.

IR2 #7

How much shoreline will be oiled with spills of the 25, 50 and 75% of tanker capacity for the size of the tankers KM anticipates it will contract to transport the proposed 890,000 bbl. /daily production?

Context: In the report Document #REP-NEB-TERA-00031 Ecological Risk Assessment of Marine Transportation (<https://docs.neb-one.gc.ca/ll-eng/llisapi.dll/fetch/2000/90464/90552/548311/956726/2392873/2451003/2393244/B19-14 - V8B TR 8B7 01 OF 24 ERA MAR SPILL - A3S4K7.pdf?nodeid=2393426&vernum=-2>) it is concluded that the “ *Results for the CWC spill indicate a high to very high probability (50%) of between 143 km and 458 km of shoreline oiling, with the greatest spatial extent of shoreline oiling occurring during winter conditions. The smaller spill case predicts a high to very high probability of shoreline oiling between 94 km and 248 km.*” One of the shoreline impacts modelled is shown below for Archane Reef based on a CWC winter spill .



IR2#8

Will KM provide a model that shows a release point closer to Victoria and the Oak Bay Islands ER to understand how much oil can potentially reach the shore in this section of the shipping route?

Context: Three release points were modelled Strait of Georgia, Archane Reef (near Swartz Bay) and Race Rocks west of Victoria. To understand and develop world class spill preparedness a worst case scenario off Oak Bay Islands will be needed. New modelling has to reflect a new Worst Case oil spills based on increases in tanker sizes and daily output to be considered credible.

IR2# 9	<p>Please clarify why the “credible worst case scenario” modelled and referenced above assumes that only a relatively low percent of tanker capacity is spilled? Context: The Exxon Valdez lost most of its cargo.</p>
IR2#10	<p>The Exxon Valdez was truly a worst case scenario and lost a majority of its oil. Will KM provide another credible very worst case spill scenario based on the size of tankers that will be contracted and a spill that accounts for a majority of the oil being transferred to the marine ecosystems for the three release points modelled earlier?</p>
IR2# 11	<p>There were differences in understanding of the likely behaviour of dilbit in a marine environment as provided to the NEB during the Northern Gateway hearings. Given that KM has the best understanding of what will be shipped, what has KM learned about the characteristics of spilled dilbit and the probability that dilbit can sink to the ocean floor? Context: It is clear that this understanding is central to a spill recovery and preparedness plan.</p>
IR2 #12	<p>There are a number of marine ecological reserves that include a sub-tidal element and (A3W7H0 https://docs.neb-one.gc.ca/ll-eng/llisapi.dll/Open/2453639 FER IR1 question #1 provided a summary of foreshore within ERs) What does KM recommend and plan to use to removal of sunken dilbit from Ecological Reserves? Context. The above questions are aimed to understand how much oil could end up in the marine ecosystems and impact ecological reserves. FER wants to understand the link between the Oil spill preparedness plans, and whether the spill preparedness will be in any way limited or linked to only the previously modelled CWC scenarios.</p>
IR2 #13	<p>What is the KM plan to share and invite input by the public to the Oil Spill Response plan? Context: Board of FER does not accept nor has an adequate rationale been supplied to support statements that “<i>emergency management plans are proprietary and of a sensitive nature and due to security concerns are not publicly available nor will they be made available.</i>” Nor can we accept nor has an adequate rationale been provided to the approach advocated by Trans Mountain (TM) that TM can dictate who is allowed to see the level of preparedness and even then only if those allowed by TM sign confidentiality agreements. The residents of the Gulf Islands and the southern Vancouver Island and the natural environment are at the greatest risk from impact on lifestyle and local economic sustainability from an oil spill along the tanker route. A spill of any size will profoundly change their environment and health for a significant period of time. Ecological Reserves are only a small but productive representation of the coastal line along the route. When the Nestucca oil spill occurred in Gray’s Harbour Washington it was the residents of Tofino and Ucluelet together with other volunteers who did the oil removal from Long Beach. The Board of FER believes when there is an oil spill along the tanker route it will be the residents of Mayne Island, Galiano Island, Pender Island, Saltspring Island, Saanich Peninsula, Victoria, Metchosin, Sooke, Port Renfrew, Ucluelet and Tofino and the many First Nations whose traditional lands border the tanker route who will suffer the impacts and who will desperately want to restore the marine ecosystems</p>

	<p>to a semblance of their former productivity. The Board of FER believes organizations like FER have valuable information that needs to be included in spill preparedness and be included so we can provide input and comment on the WCMRC Oil Spill Response Plan</p>
IR2# 14	<p>How many ships contracted by KM were inspected by the Canadian Coast Guard (DDG) since 2010 and were any assessed as substandard?</p> <p>Context: There is a reference to a Coast Guard 2010 report regarding inspections of ships in BC waters. This reference was found in a report commissioned by the BC government and done by Nuka Research http://www.env.gov.bc.ca/main/west-coast-spill-response-study/. The report notes that in 2010, the CCG inspected 1082 ships, and found deficiencies in 40 % of them. We want to know what information TMX has acquired in terms of the most recent CCG assessments of ships in general. Specifically FER is concerned that substandard ships are currently in operation and on contract to KM so Board of FER is seeking some assurances from KM and evidence of due diligence is being applied to current vessels being used</p>
IR2# 15	<p>Will KM make available the spill preparedness plans so that the public can understand what will be in place?</p> <p>Context: The Board of FER has requested information to understand spill volumes used in the Credible Worst Case scenarios. The Board of FER is also seeking information on changes in volume of shipping of dilbit and probable changes in size of tankers that will be contracted to understand what is reasonable to maintain as oil spill cleanup infra-structure. FER is concerned about oil spills and transparency and disclosure and the serious disconnect between what WCMRC professes as a Corporation and as stated in their 2012 handbook (http://wcmrc.com/wp-content/uploads/2013/06/WCMRC-Information-Handbook-2012.pdf) which states: We (Western Canada Marine Response Corporation) value:</p> <ol style="list-style-type: none"> 1. <i>Open and honest communication that fosters a climate of trust.</i> 2. <i>Integrity in all our business practices</i> 3. <i>Being a steward of the environment</i> 4. <i>Success through competency, creativity and teamwork</i> 5. <i>Celebrating individual and team successes.</i> <p>To have these good values announced as the corporate culture does mean a great deal with regard to social license. There is duplicity when TM seeks to deny access to the public and intervenor that are at undisclosed financial, environmental and cultural risk and need disclosure of the WCMRC Oil Spill Response Plan.</p>
IR2# 16	<p>To what extent if any, will spill costs be covered through current insurance requirements and to what extent if any could the public be liable for cost over runs on a major oil spill? Will you also verify that dilbit is defined as “oil” for the purposes of insurance claims.</p> <p>Context: We understand tanker operators must pay insurance but it is unclear if the insurance levels are adequate in many circumstances, and will apply to all forms of transported oil. We have reviewed the submission to the NEB Enbridge Project by Matthew Boulton October 2010 called the <i>Financial Vulnerability Assessment: Who Would Pay for Oil Tanker Spills Associated with the Northern Gateway Pipeline?</i> This report was prepared For Living Oceans Society with supervision from the University of Victoria Environmental Law Centre. This report raises concerns that the KM is subject to the same limitations found in the Northern Gateway process</p>

	<p>when it comes to a major oil spill.</p> <p>Boulton states <i>“the total amount available for compensation, clean-up and natural resource damages would be approximately \$1.33 billion CAN. Yet clean-up costs alone for the Exxon Valdez disaster exceeded \$2.5 billion USD, and that was in 1989. The cost for compensation and natural resource damages for the Valdez spill were judged to be at least \$1 billion USD. The total for cleanup costs, compensation and damages for the Valdez disaster was at least \$3.5 billion USD – and likely much higher. For example, one Alaska study of just sport fishing activity and tourism losses indicated a lost passive use value at \$2.8 billion. ... the U.S. government recently required British Petroleum to establish a \$20 billion compensation fund for the oil spill disaster in the Gulf of Mexico”</i></p> <p>It is also our understanding that KM holds a significant share in the company contracted for spill response, the Western Canada Marine Response Corporation (WCMRC). This ownership appears to place KM in a conflict of interest with regard to safety and preparedness because an oil spill is now a revenue source for KM and not a liability or cost. Because of this it is difficult to believe that KM or WCMRC have sufficient motivation for spill prevention or response in light of KM being first in line for draws against tanker owners insurance. These concerns were outlined to Northern Gateway process Robyn Allan, June 21 2013. Canadian Ship-Sourced Spill Preparedness and Response An Assessment. Submitted to the Tanker Safety Expert Panel. Pp30. FER, other intervenors, and the public will only be able to understand environmental and financial risk when information on liability and restoration , compensation, and mechanism for disbursement are clearly outlined. We are asking for that now. http://www.robynallan.com/wp-content/uploads/2013/06/Canadian-Ship-Sourced-Spill-Preparedness-and-Response-June-21-2013.pdf</p>
IR2# 17	<p>What baseline studies of sensitive ecological areas does TMX plan to establish or use as scientific evidence to quantify ecological restoration or recovery trends, in the event of an oil spill?</p> <p>Context: A fundamental tenant of restoration or recovery is to understand reference ecosystems which is why Ecological Reserves have been designated and exist within the Salish Sea and along the tanker route.</p>
IR2# 18	<p>Please provide an up-to-date chart and an indication of who is responsible to provide for long term costs for the protection of Ecological Reserves and cleanup in the event of catastrophic occurrences.</p> <p>Context: The findings of Intervenor Robyn Allen on the limited responsibility of Kinder Morgan in its organizational structure are a concern to Board of FER with regard to clean up and recovery of ecological reserves. The public appears to be the last party able to make a draw for costs of a spill.</p>
IR2# 19	<p>Please provide a clear account of from where the distillate to make Dilbit is imported, how much volume, and how often tankers laden with distillate or other compounds used to make Dilbit transit inbound in the Strait of Juan de Fuca, on their way to the Westbridge Terminal?</p> <p>Context: Board of FER is unsure how much distillate is being imported and how it will impact the environment and public health in the event of a marine spill of distillate.</p>

IR2# 20	<p>What specific measures does KM plan to implement directly or through WCMRC affiliates for safe transit of Dilbit through the human communities and sensitive ecological communities along the proposed tanker routes?</p> <p>Context: This information is requested and is in keeping with provincial objectives to see this project meets world class spill standards.</p>
IR2# 21	<p>Please provide a map showing the location and % of the shipping route within 2 km of the shoreline for the length of the RSA, and highlight the ecological reserves that are within 2 km of the shipping route.</p> <p>Context: In the Trans Mountain Pipeline ULC Trans Mountain Expansion Project NEB Hearing Order OH-001-2014 Responses to Information Request from Board of the Friends of Ecological Reserves Errata (https://docs.neb-one.gc.ca/11-eng/llisapi.dll/fetch/2000/90464/90552/548311/956726/2392873/2451003/2487413/B239-12 - Trans Mountain Response to FER IR No. 1.03.05-Errata - A3Z4T8.pdf?nodeid=2487416&vernum=-2)</p> <p>---3. Absence of known marine bird colonies as indicators for long term monitoring and reporting of marine health.</p> <p>The erratum to the earlier response was a change in the removal of the phrase <i>“less than 5% of the shipping route”</i>. <i>“Shorebirds are unlikely to be affected by routine Project operations as they are restricted to coastal habitat, which is within 2 km of the shoreline for less than 5% of the shipping route. The influence of the Project on such species would be limited to wake effect, which is well within the range of natural wave conditions and is therefore not expected to result in adverse effects to marine birds.”</i> In light of that correction of fact, we know KM has information on the actual % of the route when tankers operate within 2 km of the shoreline and that % must be greater than 5 %.</p>
IR2# 22	<p>In the consultants reports on marine impact why were wave conditions considered instead of the inherent effects of increased exposure to chronic and catastrophic oil exposure events?</p> <p>Context: With reference to the previous quote of TMX included in the statement of errata in IR 2 17 : <i>“The influence of the Project on such species would be limited to wake effect, which is well within the range of natural wave conditions and is therefore not expected to result in adverse effects to marine birds.”</i></p>
IR2# 23	<p>Several intervenors recognized that the major threat along the tanker route is not from wave height but from exposure to an oil spill. Given this will TMX to provide information about risk to shoreline species resulting from the chronic pollution and minor and major oil spills?</p> <p>Context: The Board of FER concern lies largely with exposure of species and ecosystems associated with Ecological Reserves along the tanker path and perturbation by anthropogenic causes such as marine noise and oil spills. KM has provided studies on noise and wave height but not on impacts on shore zone from spilled oil.</p>
IR2# 24	<p>Please explain what is meant by the line <i>“weather permitting and subject to the requirements identified in a future Pacific Pilotage Authority 'Notice to Industry'.</i> Does this mean the pilot will not go on board if the weather is too bad, or the pilot will remain on board (until where?) Please indicate in the response in quantitative</p>

	<p>terms what weather permitting means such as predicted wind speed thresholds and direction and wave heights and swell intensity for the permitted passage of tankers past Race Rocks. Are there weather thresholds that will be used for the cessation of ocean transport tankers, tethered and untethered escort tugs and requirements for pilots to remain on board and provisions for removal further to sea?</p> <p>Context: Recommendation # 9 of Termpol 2014 report States: <i>Trans Mountain should implement extended untethered escort for outbound laden Project tankers through the Strait of Juan de Fuca. (3.24 proposed Risk Mitigation Measures)</i> <i>Finding 18: The TRC supports extending the pilot disembarkation zone and tethered tug escort requirements for Project tankers to an area in the vicinity of Race Rocks, weather permitting and subject to the requirements identified in a Pacific Pilotage Authority 'Notice to Industry'.</i></p> <p>To which TMX replied : (3.2.4 Proposed Risk Mitigation Measures) <i>Trans Mountain is pleased with the TRC's support for extending the pilot disembarkation zone and tethered tug escort requirements for Project tankers to an area in the vicinity of Race Rocks, weather permitting and subject to the requirements identified in a future Pacific Pilotage Authority 'Notice to Industry'."</i></p>
IR2# 25	<p>For tankers inbound in the Strait of Juan de Fuca carrying any of the toxic components of Dilbit, where will pilots be taken on Board and at what point along the route would that be?</p>
IR2# 26	<p>Are there plans for escort and pilotage of Dilbit carrying tankers currently transporting Dilbit out of Burnaby? Please indicate the number and size of tankers currently in operation and provide reasons for any proposed differences in obligations of those tankers?</p> <p>Context: Board of FER remains concerned about the preparedness even to meet current KM shipping arrangements. KM can show it is ramping up current operations and best practices to higher standards equivalent to those being proposed for TMX project.</p>
IR2# 27	<p>What is the number of "available" tugs needed for tethered tanker escort when the TMX Project is completed and where and when are tugs of this type going to be available?</p> <p>Context: In the report titled An Evaluation of Local Escort and Rescue Tug Capabilities in Juan de Fuca Strait Project 213-063 Revision 3 November 27, 2013 https://docs.neb-one.gc.ca/11-eng/11isapi.dll/fetch/2000/90464/90552/548311/956726/2392873/2451003/2393359/B21-4 - V8C TR 8C 12 TR S3 TUGS JUAN DE FUCA STRAIT - A3S5G0.pdf?nodeid=2393971&vernum=-2</p> <p>This report is skeptical about the current ability of the Canadian escort tugs and whether they are dependable. The following statements are made in reference to tugs with the capabilities of handling tankers. <i>"Of that group of six (6), three are not fitted with aft towing winches, hence are incapable of rescue towing. That leaves only three tugs in BC which have the combined capability of performing escort and rescue towing in Juan de Fuca Strait."</i> (page 31)</p>
IR2# 28	<p>What are the current requirements for speed of tankers in the different sectors of the tanker route for the transit of outgoing and incoming vessels? The modelling done on potential mechanical malfunctions such as loss of rudder shows that a tanker can</p>

	<p>be grounded within 14 minutes. Please provide similar modelling such as this for the Eastern entrance of the Strait of Juan de Fuca, off Race Rocks Ecological Reserve and for Haro Strait off Oak Bay Islands Ecological Reserve. Also please include possible scenarios with a 7 knot current running off Race Rocks in both flood and ebb conditions with wind driven scenarios of up to 80 knots, from both easterly and westerly directions in the Strait of Juan de Fuca. It was also unclear from the modelling what the acceptable speed of tankers are in Canadian waters. Please explain the rationale why the WCRMC Handbook indicates that it will take 72 hours to respond to a spill at Race Rocks. (Source http://wcmrc.com/wp-content/uploads/2013/06/WCMRC-Information-Handbook-2012.pdf)</p> <p>Context. The modeling done on potential mechanical malfunctions such as loss of rudder shows that a tanker can be grounded within 14 minutes. It was unclear from the modelling what the acceptable speed of tankers is in Canadian waters. https://docs.neb-one.gc.ca/ll-eng/llisapi.dll/fetch/2000/90464/90552/548311/956726/2392873/2451003/2503819/B259-13_- Juan de Fuca Strait Proposed Tug Escort Simulation Study %2829 Aug 2014%29 - A4A7R2.pdf?nodeid=2504221&vernum=-2</p>
IR2 #29	<p>Given that Provincial marine parks and marine ecological reserves are managed and protected by the Province of British Columbia would you accept a decision of the Province of BC to conduct its own Environmental Assessment?</p> <p>Context: The BC government has the ability to require an independent Environmental Assessment should it be unable to obtain the information through the NEB process. Then it seems reasonable for the Province of BC to conduct its own Environmental Assessment. This information is needed to assess the liability and risk and the question of whether or not the public interest of BC citizens is being served by this project.</p>
IR2# 30	<p>What are the regulations in place from DFO which will mitigate the impact of increased tanker traffic and potential oil spills from the TMX project with regard to the Southern Killer Whale population.</p> <p>Context: FER is concerned that some of the information used by the TMX consultant is out of date and populations continue a decline in the last 7 years, In "Recovery Strategy for the Northern and Southern Resident Killer Whales (<i>Orcinus orca</i>), March 2008 , the following information is provided: "<i>Resident killer whale populations in British Columbia are presently considered to be at risk because of their small population size, low reproductive rate, and the existence of a variety of anthropogenic threats that have the potential to prevent recovery or to cause further declines. Principal among these anthropogenic threats are environmental contamination, reductions in the availability or quality of prey, and both physical and acoustic disturbance. Even under the most optimistic scenario (human activities do not increase mortality or decrease reproduction), the species' low intrinsic growth rate means that the time frame for recovery will be more than one generation (25 years). The southern resident killer whale population experienced declines of 3% per year between 1995 and 2001, and has increased since then to 85 members in 2003. During the summer and fall, southern residents</i></p>

	<p>are primarily found in the trans-boundary waters of Haro Strait, Boundary Pass, the eastern portion of the Strait of Juan de Fuca, and southern portions of the Strait of Georgia. This area is designated as ‘critical habitat’ based on consistent and prolonged seasonal occupancy. Some members of the population typically remain in the same general area in winter and spring, but others appear to range over much greater distances, and have been reported as far south as Monterey Bay, California, and as far north as Haida Gwaii (the Queen Charlotte Islands). Winter and spring critical habitat has not been identified for the latter group. During the summer and fall, the principal prey of southern residents appears to be chinook and chum salmon (<i>Oncorhynchus tshawytscha</i> and <i>O. keta</i>); little is known of their diet in the winter and spring. The lack of information about winter diet and distribution of the southern residents is a major knowledge gap that impedes our understanding of the principal threats facing the population”.</p>
IR2# 31	<p>Please provide information on how the completed action plan has affected the way in which Trans Mountain will deal with mitigation of the issues listed in the DFO Recovery Strategy for Killer whales.</p> <p>Context: The following information was provided in section 5.7 of the Recovery Strategy . ”Action Plans will be necessary to successfully achieve the objectives and approaches of the resident killer whale recovery strategy. Action plans addressing the issues of 1) population dynamics and demographics, 2) reduced prey availability, 3) contaminants, 4) physical disturbance, 5) acoustic disturbance, and 6) critical habitat, will be completed by March 31, 2013. Further examination of prey availability and acoustic disturbance may be necessary due to the complex nature of these issues.</p>
IR2# 32	<p>In light of the research available on the effects of ship-based acoustic effects on the long-term potential for survival of Killer Whales, what mitigation measures are going to be imposed on the speed and frequency of ships carrying TMX products in the tanker traffic corridor through killer whale habitat?</p> <p>Context. In the Recovery Strategy for Killer whales published by NOAA in 2008, The risk of Noise on Killer whales was outlined. "Since (1995), there has been a rapidly growing awareness that noise is a significant threat that degrades habitat and adversely affects marine life (IUCN 2004, IWC 2004). It is estimated that ambient (background) underwater noise levels have increased an average of 15 dB in the past 50 years throughout the world’s oceans (NRC 2003). Killer whales have evolved in the underwater darkness using sound much the way terrestrial animals use vision: to detect prey, to communicate and to acquire information about their environment. Anthropogenic noise can interfere with all these activities in critically important ways, such as disrupting communication, reducing the distance over which social groups can detect each other, masking echolocation and hence reducing the distance over which the animals can detect their prey, potentially displacing them from preferred feeding habitats, displacing prey, impairing hearing, either temporarily or permanently, and in extreme cases causing death (Bain and Dahlheim 1994, Barrett-Lennard et al. 1996; Erbe 2002, Bain 2002, NRC 2003, Au et al. 2004). Shipping. Commercial shipping has increased dramatically in recent years. For example, between 1995 and 1999 the worldwide commercial shipping fleet</p>

increased 12% (NRC 2003). There are few studies that have measured changes in the background underwater noise levels over time, but those that do suggest that increased vessel traffic is responsible for the increase in ambient noise over the last 100 years (e.g. Andrew et al. 2002). In the northern hemisphere, shipping noise is the dominant source of ambient noise between 10 to 200 Hz (NRC 2003). While shipping energy is concentrated at low frequencies, ships produce significant amounts of high frequency noise as well. The consequences of these chronic sources of noise on killer whales have not been assessed.

At a presentation by Scott Veirs at the Salish Sea Ecosystem Conference in Seattle in May 2014 entitled "Noise impacts in the Salish Sea under commercial shipping growth scenarios" the research of BEAM Reach has provided a stark picture of the threshold levels of acoustic noise from ships beyond which Killer whales can obtain food and communicate by Echolocation allowing their survival.

<http://www.beamreach.org/2014/04/30/emaze-talk-fossil-fuel-ship-noise-killer-whales> See more at: <http://www.beamreach.org/2014/04/30/emaze-talk-fossil-fuel-ship-noise-killer-whales#sthash.6DTS4jf7.dpuf>

Another article entitled Salish Sea Orca Whales Not Mating, Socializing in Polluted Soundscape <http://www.desmog.ca/print/8076> This article states that "Vessel noise is already hindering endangered southern resident killer whales from communicating and finding fish and the noise bombardment will get worse if proposals for coal terminals and pipelines in B.C and Washington State are approved"

Scott Veirs, [Beam Reach Marine Sciences and Sustainability School](#) program coordinator and professor, speaking at the Salish Sea Ecosystem Conference stated that "Ships dominate the soundscape of Puget Sound," Veirs and his students take underwater sound recordings off Lime Kiln Park on San Juan Island, an area where the killer whales are known to spend time, and then model the echo-location and communication consequences for the resident killer whales. The resident killer whale population has dropped this year to 80 animals in three pods, the lowest number in more than a decade. Sounds of swooshes, rattles and bangs echoed through the room as Veirs demonstrated noises surrounding the whales every day and audience members covered their ears as he played the screeching and metallic grindings made by a ship with a damaged propeller.

"At least one ship is present about 40 per cent of the time and when that ship is going through it reduces the range that whales can communicate by 68 per cent," Veirs said. That means the whales miss about 37 per cent of calls and, if traffic doubles – as it could with increases in oil tankers from twinning the Kinder Morgan pipeline from Alberta to Burnaby and with 21 per cent more carriers and barges from proposed coal terminal expansions in B.C. and Washington – it is estimated the whales will miss 44 per cent of the calls. Current noise levels mean whales are already finding almost 50 per cent less fish than they would otherwise and a doubling of traffic would increase that to 58 per cent. The noise is having a significant impact as chinook salmon is already scarce. Canadian and U.S. government studies have pinpointed lack of salmon – and particularly the whales' preferred diet of chinook – noise and pollution as the major threats faced by the

<i>resident killer whales.</i>
