



FRIENDS OF ECOLOGICAL RESERVES
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 CANADA

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To: National Energy Board "NEB"
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From: Board of Friends of Ecological Reserves
 C/O Mike Fenger, mfenger@telus.net
 President, Friends of Ecological Reserves
 511 Foul Bay Road
 Victoria BC V8S 4G9

Attention: Sheri Young

**Re: Hearing order OH-001-2014
 Trans Mountain Pipelines ULC ("Trans Mountain")
 Application for Trans Mountain Expansion Project
 Notion of Motion to Compel Full and Adequate Responses to Information Requests (IRs)**

Please find enclosed the notice of motion to compel full and adequate responses to IRs, filed on behalf of the Board of Friends of Ecological Reserves (FER). The filing is in the form of a Table with colour coding as follows:

Adequate Responses	Inadequate responses
4, 5, 10, 11, 14, 16, 18,21, 23, 25, 26	1, 2, 3, 6, 7, 8, 9, 13, 15, 17, 19, 20, 24, 28, 29, 30, 31, 32.

FER would like to take this opportunity to state that we reviewed all responses. For the inadequate responses we have provided clarification to support that claim. We have also retained all IRs and responses as we have learned from the adequately answered responses too, and these need to remain part of the record.

We have provided links to documents wherever possible through footnotes. We have used endnotes to display maps or portions of references provided by TMX when needed to support understanding of IRs.

Fenger
 President of Friends of Ecological Reserves
 Ecological Reserves
 Cc: Board of Friends of Ecological Reserves

Mike
 Garry Fletcher
 Board member of Friends of

Table of IR 2 and the dialogue between Board of Friends of Ecological Reserves (intervener) and KM TMX (proponent).

#IR	IR Wording	Trans Mountain Responses to IRs	Intervenor’s clarification for claiming IR responses inadequate.
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>	<p>Reference provided¹.</p> <p>Kinder Morgan does not make the determination of when an area is restored or when clean is clean (cleanup endpoints). Members of the Unified Command, the National Emergency Environmental Team (NEET), participating local stakeholders, and contracted specialist, will have input into establishing cleanup endpoints. Endpoints will typically be determined through a Net Environmental Benefit Analysis (NEBA). As applied to an oil spill incident, NEBA is a formal process to evaluate the risks and benefits of certain proposed cleanup techniques and strategies. NEBA is a stakeholder’s performance metric that weighs many factors against the cleanup endpoints established by the Unified Command (UC). This analysis will consider the specific treatment options appropriate to the response; the potential for successfully implementing those discrete options; the environmental trade-off attached to each technique; and, lastly, the types of treatments that can be authorized within the existing regulatory framework.</p> <p>Although each oil spill is unique, NEBA will conceptually develop a decision flowchart to answer the questions of:</p> <ul style="list-style-type: none"> • What will be the probable outcome if no countermeasures are deployed? • What will be the probable outcome if only 	<p>This is an inadequate Response: To support this claim here is a reference: explaining “NEBA” Net Environmental Benefit Analysis : The following points are made:</p> <p><i>Every government and community member can help us in achieving our goal of a rapid and unified response.</i></p> <ul style="list-style-type: none"> • <i>Partner with us before a spill, participating in conversations with industry on a regular basis.</i> • <i>Join us for drills and exercises in your community.</i> • <i>Support our efforts to put plans and pre-approvals in place before a spill. Through effective preparation, we can create a quicker and more efficient response together”----</i> <p>In light of these goals when will KM TMX have the anticipated timetable for information on emergency measures, drills and exercises and other community engagement efforts to be revealed to those groups mentioned –as indicated</p>

¹ American Petroleum Institute (2013). Net Environmental Benefit Analysis for Effective Oil Spill Preparedness and Response. Washington, DC. 32 pp.
Environment Canada. 2007. Guidelines for Selecting Shoreline Treatment Endpoints for Oil Spill Response. Ottawa, ON. 29 pp

		<p>conventional mechanical countermeasures are deployed?</p> <ul style="list-style-type: none"> On a priority basis, what are the resources (environmental, social and economic) at risk if applied countermeasures prove to be inadequate? 	<p>“before a spill”?</p> <p>In addition, from this same presentation <i>Key Points:</i></p> <ul style="list-style-type: none"> <i>Inherent limitations exist in terms of the amount of oil that can be recovered during any given response effort.</i> <i>There will be negative side effects of oil spills, even when the most effective tool is chosen.</i> <i>Government, communities, and industry must assess potential spill impacts and make decisions together.</i> <i>Access to appropriate response tools is critical for successful response. “</i> <p>We maintain that spills cannot be allowed to occur in the most sensitive and highly protected ecosystems of the province. How can governments, communities and industry be expected to “<i>make decisions together</i>” when there is currently no provision for an ecological monitoring system to be put in place before a catastrophic event, so there is no way of measuring/quantifying or mitigating any negative effects?</p>
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</p>	<p>On October 23, 2014, Trans Mountain met with 11 representatives of Environment Canada to discuss development of a marine bird monitoring program. The Environment Canada participants were Sean Boyd, Coral Deshield, Bob Elnor, Mark Hipfner, Jennifer Huxter, Agathe LeBeau, Erika Lok, Ken Morgan, Andrew Robinson, Kerry Woo, and Miles Zurawell. Trans Mountain is currently exploring potential partnerships with other marine users and</p>	<p>This response is not adequate.</p> <p>Given that not only summer nesting but migratory stopover and overwintering populations of marine birds are considerable on the shores and islands of Georgia Strait and Juan de Fuca Strait, it is of great concern that a marine bird</p>

<p>to long term monitoring of at least some indicators such as marine birds. “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. 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</p>	<p>researchers; for additional information on programs already underway, refer to GoC IR No. 2.047a²,</p>	<p>monitoring program is not planned for as an implementation requirement .</p> <p>An examination of the 467-page reference GoC IR No. 2.047a, Filing ID A4H6A5, gives no indication of a proper set of baseline studies being planned for sensitive marine areas. (In 2.046 of that report) In the Preamble, “<i>Marine Transportation Vessel Volume Changes for the Washington State Refineries Arising from the Proposed Project In the British Columbia Marine Environment</i>”, migratory birds, including several species listed under the Species At Risk Act, fall under Environment Canada’s mandate under the Migratory Birds Convention Act, 1994. As described in Volume 1 of the Application (Exhibit B1-1) and on the Kinder Morgan website (www.kindermorgan.com/business/canada/puget_sound.cfm), the Kinder Morgan Puget Sound pipeline system ships Canadian crude oil and condensates via the existing Trans Mountain Pipeline system from Abbotsford, BC, for delivery to Washington State refineries at Anacortes, Cherry Point and Ferndale. If marine transportation increases at these Washington State refineries as a result of</p>
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² TMX response to Government of Canada Response to Information Request from Natural Resources Canada for Government of Canada (GoC) <https://docs.nrc-one.gc.ca/ll-eng/llisapi.dll/fetch/2000/90464/90552/548311/956726/2392873/2451003/2685398/B310-2 - Trans Mountain Response to GoC IR No. 2 - A4H6A5.pdf?nodeid=2685004&vernum=-2>

<p>term monitoring is needed to know if this was a peak season, average or below average for this colony site</p>		<p><i>the Trans Mountain Expansion Project, then there may be additional cumulative effects on marine birds located in the Juan de Fuca Strait. This is because Canadian and American outbound vessels share the same shipping lane in the Juan de Fuca Strait (Exhibit B18-19, PDF page 39 and Exhibit B18-20, PDF page 4). A description of how marine transportation activities may change for the above Washington State refineries as a result of the Project <u>was not included in the environmental assessment</u>. As such, it is not currently known if there will be additional cumulative effects on marine birds in the Juan de Fuca Strait arising from these activities.</i></p> <p>Your answer to the GOC “Trans Mountain has no knowledge of Washington State refinery operations and is unable to forecast the extent to which marine shipping activities will change for the Washington State refineries (Anacortes, Cherry Point, and Ferndale) as a result of the proposed Project,” leaves us even more concerned about the importance of long term monitoring of resident, migratory and over-wintering colonies of marine birds. We are led to believe that no one at KM really has a clue about what is in sensitive areas and no one actually wants to know.</p>
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			<p>On page 141, TABLE 2.035A-2 HABITAT, OCCURRENCE AND MITIGATION FOR SPECIES AT RISK POTENTIALLY AFFECTED BY THE PROJECT the following statement is included beside several of the Species at Risk:</p> <ul style="list-style-type: none"> • <i>“No mitigation is recommended for marine vessel traffic since Project-related marine vessels will be operated by third-party subcontracting corporations acting under relevant shipping and piloting authorities. Marine transportation in Canadian territorial waters is regulated through the Canada Shipping Act administered by Transport Canada and the Canadian Coast Guard (CCG).</i> <p>That is not our understanding of the level of responsibility that the KM TMX is obliged to take for the Marine Transportation component of the project. See Attachment to the Board Letter Dated September 10th 2013 Pages 1 of 3³.</p> <p>Filing Requirements Related to the Potential Environmental and Socio-Economic Effects of Increased Marine Shipping Activities Trans Mountain Expansion Project. <i>Although the increased marine shipping to and from the Terminal is not part of the Project proposed by Trans Mountain Pipeline ULC (Trans Mountain), the Board has</i></p>
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³ https://docs.neb-one.gc.ca/ll-eng/llisapi.dll/fetch/2000/90464/90552/548311/956726/2392873/956924/1035381/A3K9I2_-_Filing_Requirements_Related_to_the_Potential_Environmental_and_Socio-Economic_Effects_of_Increased_Marine_Shipping_Activities_-_Trans_Mountain_Expansion_Project.pdf?nodeid=1035506&vernum=-2

			<p><i>determined, by way of Issue #5 in its List of Issues, that potential environmental and socio-economic effects of those marine shipping activities, including the potential effects of accidents or malfunctions that may occur, are relevant to the Board's consideration of the application under the National Energy Board Act.</i></p>
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 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>	<p>The list of additional navigational aids in Section 5.2 of TERMPOL 3.5 and 3.12 in Volume 8C (Filing ID A3S4T7⁴) contains a compilation of feedback from various discussions with individual pilots as well as general measures.</p> <p>However, it is not suggested that these improvements are required to ensure that adequate levels of navigational safety are maintained. It is Trans Mountain’s view is that the suggestions are not essential requirements, but items that could benefit all marine traffic. Trans Mountain has not investigated the implementation of the suggestions further, as the responsibility would be in the jurisdiction of the Canadian Coast Guard (CCG) to consider as part of their normal review of navigational aids across Canada. Trans Mountain is available to facilitate the CCG’s evaluation of navigation aids upon request from the CCG, to the extent practical.</p>	<p>This is not an adequate response.</p> <p>Though TMX supports improvements in navigation aids, it takes no leadership or responsibility for 1000+ annual sailings this project burdens CCG and others with, nor does it answer the question of how to mitigate the added risk to the environment.</p> <p>Interpretation. TMX believes it is not responsible for navigational aids so enhancements fall to CCG. The nineteen navigational improvements are recommended by the pilots interviewed. These improvements are included in end note(i) These recommendations can hopefully influence permit conditions as they increase safety and reduce spill risk. There appears to be a difference of views with regard to incremental risk from the project and any KM responsibility. To</p>

⁴ Volume 8c. Moffatt and Nichol 2013 Nov 26 TERMPOL 3.5 & 3.12- Route Analysis & Anchorage Elements. TMX Expansion Project https://docs.neb-one.gc.ca/ll-eng/llisapi.dll/fetch/2000/90464/90552/548311/956726/2392873/2451003/2393677/B20-24 - V8C_TR_8C_10_TERMPOL_3.5_3.12_1_to_13_ROUTE_ANCHORAGE - A3S4T7.pdf?nodeid=2393619&vernum=-2 (accessed Feb 2015)

			<p>FER, KM bears some of the responsibility as the project brings incremental risk through added cumulative effects. Based on their response, KM indicates it has no responsibility as this falls solely to the Government of Canada and CCG who manage through implementation of legislation. If approved without conditions, the costs and added burden will fall solely to Canadians to subsidize navigational aids on behalf of KM to reduce risk of an oil spill added by this project. We believe the risk bringer bears some of the responsibility.</p>
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_S PILL_-_A3S4K7.pdf⁵) 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</p>	<p>As described in Volume 8A, Section 1.0 (Filing ID A3S4X3) [see footnote 3 to access this report], the maximum size of tanker proposed by the Project is Aframax size. Some Panamax tankers (smaller than Aframax tankers) may also be used, depending on availability of shippers.</p>	<p>This is an adequate answer.</p> <p>We are pleased that there is an assurance about tanker size provided in the answer but cannot find the support for this in the reference.</p>

⁵ Volume 8 a Marine Transportation. https://docs.neb-one.gc.ca/ll-eng/llisapi.dll/fetch/2000/90464/90552/548311/956726/2392873/2451003/2393783/B18-19_-_V8A_1.0_TO_1.4.2.6_MAR_TRANS_ASSESS_-_A3S4X3.pdf?nodeid=2393057&vernum=-2

	<p>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>		
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 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</p>	<p>It appears that the intervenor wishes to make a comment. This is not an information request. Please note that the design capacity of future Westridge Marine Terminal is 630,000 bbls/day, not 890,000 bbls/day as noted in the preamble.</p> <p>The identification of credible worst case scenario follows direction from the NEB's "Filing Requirements Related to the</p>	<p>This is an adequate response.</p> <p>We did not pose a question and are appreciative of the clarification on Westridge Marine Terminal production.</p> <p>It is important for the Board of Friends of Ecological Reserves to be informed of</p>

	<p>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>	<p>Potential Environmental and Socio-economic Effects of Increased Marine Shipping Activities, Trans Mountain Expansion Project" (Filing ID A3V6I2)⁶. Please see Volume 8C, Termpol 3.15, Section 9 (Filing ID A3S5F8)⁷ for more information on the credible worst case scenario.</p>	<p>anticipated production and number of laden and unladen tankers in order to understand spill risk and marine noise.</p> <p>We remain unclear about the actual production and number of tankers. WE think there are six per month now and another 29 per month anticipated or 420 laden tankers and the same unladen for a total 840 sailings annually. Footnote 10 links to an article that questions the KM TMX disclosure on the actual final production and sailings. Clarification is appreciated.</p>
6	<p>Please clarify why the "credible worst case scenario" (CWC) 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),</p>	<p>The identification of credible worst case scenario follows direction from the NEB's "Filing Requirements Related to the Potential Environmental and Socio-economic Effects of Increased Marine Shipping Activities, Trans Mountain Expansion Project" (Filing ID A3V6I2)⁸. Please see Volume 8C, Termpol 3.15, Section 9 (Filing ID A3S5F8)⁹ for more information on the credible worst case scenario.</p> <p><u>Robyn Allan</u>, 28 May 2014, TheTye.ca Kinder Morgan Pipeline Expansion Designed to Carry Much More Oil Trans Mountain would be built with room to largely increase export capacity.</p>	<p>This is not an adequate answer.</p> <p>Concern: Two references provided do not mention CWC scenario.</p> <p>We re-read the Hearing process order referenced in the answer (footnote 6). We find no reference to tanker capacity or limits on modeling credible worse case scenarios in the filing order. We are unclear where or who defined the size of the spill for the CWC scenario. It is</p>

⁶ Hearing Order https://docs.neb-one.gc.ca/ll-eng/llisapi.dll/fetch/2000/90464/90552/548311/956726/2392873/2449981/2445930/A15-3 - Hearing_Order_OH-001-2014 - A3V6I2.pdf?nodeid=2445615&vernum=-2

⁷ Route Segments. https://docs.neb-one.gc.ca/ll-eng/llisapi.dll/fetch/2000/90464/90552/548311/956726/2392873/2451003/2393359/B21-3 - V8C_TR_8C_12_03_OF_03_TERMPOL_3.15_RISK_ANAL - A3S5F8.pdf?nodeid=2393795&vernum=-2

⁸ Hearing Order https://docs.neb-one.gc.ca/ll-eng/llisapi.dll/fetch/2000/90464/90552/548311/956726/2392873/2449981/2445930/A15-3 - Hearing_Order_OH-001-2014 - A3V6I2.pdf?nodeid=2445615&vernum=-2

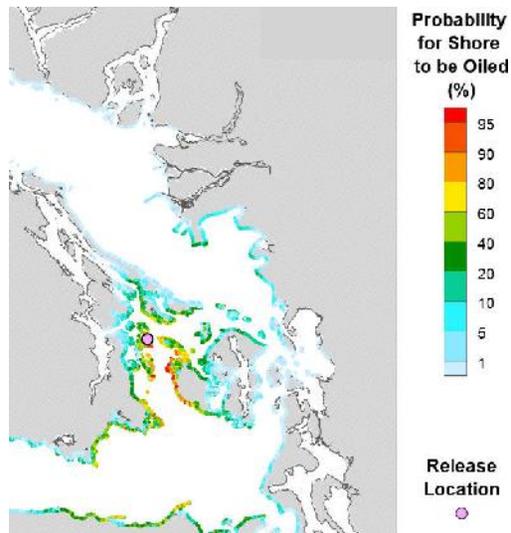
⁹ Route Segments https://docs.neb-one.gc.ca/ll-eng/llisapi.dll/fetch/2000/90464/90552/548311/956726/2392873/2451003/2393359/B21-3 - V8C_TR_8C_12_03_OF_03_TERMPOL_3.15_RISK_ANAL - A3S5F8.pdf?nodeid=2393795&vernum=-2

	<p>http://www.seas.gwu.edu/~dorpjr/VTRA/SP/CASES/VTRA%202010%20Master%20Comparison%20-%20T%20-%20RMM.pdf .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.</p>		<p>implied that KM TMX was directed by the NEB but that direction has not been provided. Where NEB has determined that a CWCS is 15% of an Aframax tanker’s capacity?</p> <p>It is unclear whether the NEB could advise a risk strategy given the Ocean Act direction (End Noteⁱⁱ)</p> <p>We remain unclear about the size and number of tanks and capacity of the project. This concern is heightened by the article in footnote¹⁰</p> <p>The second reference (footnote 7) provides no mention of CWC scenario. It is a summary of observation and photos made by an observer on a passage of an out-bound laden Greek tanker. The reference appears to bear no relevance to the request.</p>
7	<p>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</p>	<p>Please refer to responses to FER IR No. 2.05 and No. 2.06. A loss of cargo oil more than the credible worst case scenario is not a viable scenario for a double hull tanker with multiple subdivided cargo tanks as proposed by the Project and has not been modeled. Trans Mountain is confident that the evaluation of potential environmental effects at representative locations as described in the Application fulfill National Energy Board requirements and describe the</p>	<p>Not an adequate response.</p> <p>The responses to question 6 did not address why 15% of a tanker’s hold is considered a credible worse case scenario. Even at that there are estimates of hundreds of kilometres of shoreline that will be oil impacted.</p>

¹⁰ 28 May 2014, TheTyee.ca Kinder Morgan Pipeline Expansion Designed to Carry Much More Oil Trans Mountain would be built with room to largely increase export capacity. <http://thetyee.ca/Opinion/2014/05/28/Kinder-Morgan-Pipeline-Expansion/>

<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 ($\geq 50\%$) 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



range of environmental effects that could result from an oil spill along the marine shipping route.

The Board of Friends of Ecological Reserves and members of the public are concerned about the contingency planning. We are concerned that there may be too little infrastructure to meet a spill of greater than 15% of an Aframax tanker’s capacity.

The approach to minimized the worse case scenario is not in keeping with precautionary direction embedded in the Ocean’s Act. [see end note 2] for the explicit wording of that direction.

8	<p>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?</p> <p>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 spill based on increases in tanker sizes and daily output to be considered credible.</p>	<p>From a practical perspective, the strength of the stochastic approach is that it shows where spilled oil could go in the event of an accident, but the resulting probability contours are not a reliable guide as to where crude oil would go in the event of a single unique accident. However the probability contours generated through stochastic modelling are valuable for informing spill response and preparedness planning. They also provide a transparent and defensible basis for describing the range of environmental effects that could result from a spill along the marine shipping route. It is not practical to assess every conceivable accident and malfunction scenario. Evaluation of potential environmental effects at other sites would not have changed assessment conclusions or identified the need for additional preparedness and response planning measures. Therefore a model that shows a release point closer to Victoria and the Oak Bay Islands ER is not contemplated. Trans Mountain is confident that the evaluation of potential environmental effects at representative locations fulfills National Energy Board filing requirements (Filing ID A3V6I2) and describes the range of environmental effects that could result from an oil spill along the marine shipping route</p>	<p>This is not acceptable answer.</p> <p>We understand that KM may not wish to complete additional modeling of oil spills having completed modelling for Archane Reef and Race Rocks. However there remains a need to model an oil spill closer to Victoria and the Oak Bay Island Ecological Reserve.</p> <p>We believe this to be true first because the report by DNV advising TMX did identify several potential accident sites one of which is off the Victoria water front. [see end note for a map of accident sitesⁱⁱⁱ] DNV anticipated an accident off the Victoria waterfront but none was modelled. This is not appropriate.</p> <p>In addition Archane Reef is 32 km east of Oak Bay Islands ER and Race Rocks ER is 23 km west of Trial islands. FER does not understand why an oil spill off shoreline of the most densely populated stretch of tanker route on Vancouver Island was not modelled.</p> <p>Therefore we believe it is a responsibility of KM to model a CWCS close to where most of the people on Vancouver Island live. [See End note for distance from the currently modelled spills to the Oak Bay Island ER which is nearer the Victoria water front^{iv}.]</p>
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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.</p> <p>Context: The Exxon Valdez lost most of its cargo.</p>	<p>Please refer to responses to FER IR Questions .05 and 06</p>	<p>Not an adequate answer in light of how questions 5 and 6 were responded to.</p> <p>The question of why a minor per centage of tanker capacity has been defined as a ‘Credible Worse Case’ remains unanswered. We fail to understand the rationale for the definition of CWCS at 15% of an Aframax tanker’s capacity. Is their evidence that an Aframax tanker has never spilled more than 15% of its cargo?</p>
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> <p>Context: The Exxon Valdez lost most of its cargo.</p>	<p>The following information is obtained from the Exxon Valdez Trustee Council website (Exxon Valdez Trustee Council 2015). How much oil was spilled? Approximately 11 million gallons or 257,000 barrels or 35,000 metric tonnes (38,800 short tons). How much oil was the Exxon Valdez carrying? 53,094,510 gallons or 1,264,155 barrels From the above, it is clear that about 20.3% of the total cargo onboard the single hull tanker, Exxon Valdez, was spilled as a result of the accident. All tankers used for the proposed Project will be double-hulled with multiple subdivided cargo tanks. Additional safety measures will be used in a variety of other ways, such as the use of tug escorts. Trans Mountain believes that diligent evaluation and determination of a credible worst case oil spill volume for a partly loaded Aframax tanker as proposed by the Project has been conducted, which meets the National Energy Board’s filing requirements. Evaluation of spills larger than the defined credible worst case oil spill scenario will therefore not be</p>	<p>We accept the response and stand corrected on the statement that the Exxon Valdez lost most of its cargo.</p> <p>Attachment 1 provided, states that 1,264,155 barrels were on board the Exxon Valdes and generally accepted spilled amount is 257,000 barrels or 20%. We do stand by our statement that this is a worst case scenario even at a loss of 20% of hold and this is higher than the 15% CWC being modelled for KM as the worst possible spill from an Aframax tanker hold.</p>

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?</p> <p>Context It is clear that this understanding is central to a spill recovery and preparedness plan.</p>	<p>undertaken. [Attachments 1¹¹ and 1¹²]</p> <p>[References provided ¹³] It is clear in the Application (TR 8C-12 S7, Volume 8C, A Study of Fate and Behavior of Diluted Bitumen Oils on Marine Waters (Filing ID A3S5G2))¹⁴ that TMPL recognizes that some very specific conditions may lead to a portion of spilled dilbit to submerge or sink in marine waters, as can be the case for Group 3 to 4 oils given a combination of weathering and sediment interaction effects. The results of the Gainford tests, as well as studies conducted by the Government of Canada (2013) and by SL Ross (2010 and 2011), show that fresh and weathered representative samples of diluted bitumen (CLB and AWB) are expected to float on seawater. The behavior and fate of spilled dilbit (bitumen blended with condensate or synthetic crude oil) was canvassed extensively in the Joint Review Panel hearings relating to Northern Gateway, and the Panel in assessing the issue accepted the following facts:</p> <ul style="list-style-type: none"> • The maximum initial density of the dilbit would be 940 kilograms per cubic metre, in conformance with the proposed pipeline tariff specification. When initially spilled, the density would be less than that of fresh water or salt water, making dilbit a floating 	<p>This is an adequate response.</p> <p>Additional comment on what was learned. Dilbit sinks once it hits the shore and the probability of sinking increases over time as sediments are absorbed into the dilbit.</p> <p>This has implications for speed of response and capacity and preparedness for removal of sunken oil.</p>
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¹¹ Reference is the Ship-source Oil Pollution Fund CLAIMS MANUAL 2014 EDITION <http://sopf.gc.ca/en/about-us/publications/sopf-claims-manual-2014-edition>

¹² Exxon Valdez Trust Council Questions and Answers <http://www.evostc.state.ak.us/index.cfm?FA=facts.QA>

¹³ Government of Canada. 2013. Properties, Composition, and Marine Spill Behaviour, Fate and Transport of Two Diluted Bitumen Products from the Canadian Oil Sands. Ottawa, Ont. 87 pp.

SL Ross. 2010. Properties and Fate of Hydrocarbons Associated with Hypothetical Spill at the Marine Terminal and in the Confined Channel Assessment Area. Technical Data Report prepared for Enbridge Northern Gateway. 132 pp.

SL Ross. 2011. Meso-scale Weathering of Cold Lake Bitumen/Condensate Blend. Report prepared for Enbridge Northern Gateway.

¹⁴ A STUDY OF FATE AND BEHAVIOR OF DILUTED BITUMEN OILS ON MARINE WATERS 2013 https://docs.neb-one.gc.ca/ll-eng/llisapi.dll/fetch/2000/90464/90552/548311/956726/2392873/2451003/2393359/B21-5 - V8C_TR_8C_12_TR_S7_01_OF_03_FATE_DILUT_BITUMEN_MAR_WATER - A3S5G2.pdf?nodeid=2393796&vernum=-2

		<p>oil.</p> <ul style="list-style-type: none"> • Experts agreed that dilbit is not a simple two-phase mixture of bitumen and condensate, but is instead a new, cohesive, blended product. When spilled into water, lighter hydrocarbon fractions of the entire blend would begin to evaporate. As lighter fractions evaporate, the viscosity of the weathered dilbit would increase, and evaporation of remaining lighter fractions would be progressively inhibited. • Past examples of spills do not indicate that products similar to dilbit are likely to sink within the timeframe for response options, or in the absence of sediment or other suspended particulate matter interactions. • Dilbit may sink when it interacts with sediment or other suspended particulate matter, or after prolonged weathering. • Bench-top and wave tank testing indicated that dilbit is not likely to sink due to weathering alone within a short to medium timeframe. The evidence indicated that multiple factors, such as the interaction between density, viscosity, potential emulsion formation, and environmental conditions must all be examined together in • considering the fate of spilled oil, including the possibility of sinking. Much of the • evidence that the Panel heard did not consider these factors collectively. • The weight of evidence indicates that, when spilled in water, dilbit with a maximum • density of 940 kilograms per cubic metre would behave similarly to an intermediate fuel oil or lighter heavy fuel oil with a density less than 1,000 kilograms per cubic metre. Various experts, 	
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		<p>including those involved in spill response, said that these products provide reasonable analogs for dilbit behaviour as it relates to oil spill response.</p> <ul style="list-style-type: none"> • Transport Canada said that a response organization would be likely to treat a dilbit spill as a blended crude oil product spill 	
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>	<p>[References provided to support response¹⁵] It is important to first review background information regarding diluted bitumen and its potential to become submerged or sink. Thereafter response strategies will be discussed.</p> <p>1) The products shipped on the Trans Mountain system are, by tariff, restricted from having a specific gravity greater 0.94 and will not sink unless exposed to a combination of conditions. Tests conducted for Trans Mountain, by Environment Canada (2013), and by SL Ross (2010, 2011) for the Northern Gateway application, show that weathered representative samples of diluted bitumen (CLB and AWB) are expected to remain floating on dense saltwater. While the Environment Canada Report does not provide a time element for the densities of samples tested, the Gainford report (in Technical Report TR 8C-12 S7, Volume 8C, A Study of Fate and Behavior of Diluted Bitumen Oils on Marine Waters [Filing ID A3S5G2]) [see footnote number 8] showed that fresh and weathered representative samples of diluted bitumen (CLB and AWB) would float on freshwater for eight</p>	<p>This is an adequate response.</p> <p>Interpretation: It was learned that a prompt response is critical to limit environmental damage.</p> <p>Prompt and adequate response depends on infra structure being maintained and also on marine conditions, wave heights, wind and tide rips and whether these dictate that surface recovery is possible.</p> <p>There is concern that there may be a low incentive to deal with sunken oil and we provide two reasons to support this: 1) the public can no longer see the oil nor understand the impacts of toxic substances on the ocean floor. 2) After a period of time the funds provided to cover the liability will be</p>

¹⁵ Government of Canada. 2013. Technical Report – Properties, Composition, and Marine Spill Behaviour, Fate and Transport of Two Diluted Bitumen Products from the Canadian Oil Sands. Ottawa, Ont. 87 pp. <http://www.ontarioenergyboard.ca/html/oebenergyeast/documents/1633-dilbit-technical-report-e-v2-final-s.pdf>

National Energy Board. Considerations Report of the Joint Review Panel for the Enbridge Northern Gateway Project Volume 2. Calgary, AB.

Ross, S.L. 2010. Properties and Fate of Hydrocarbons Associated with Hypothetical Spill at the Marine Terminal and in the Confined Channel Assessment Area. Report prepared for Enbridge Northern Gateway. 119 pp.

Ross, S.L. 2011. Meso-scale Weathering of Cold Lake Bitumen/Condensate Blend. Report prepared for Enbridge Northern Gateway. 26 pp.

U.S. Coast Guard. 2013. Development of Bottom Oil Recovery Systems Final Report (CG-D-09-13). New London, CT. 68 pp

	<p>days or more depending on local factors such as sediment and mixing energy. The salinity of Burrard Inlet water has a greater density than freshwater. The same tests showed that conventional skimming equipment is capable of removing both fresh and weathered oil.</p> <p>Prompt response is important given that the weathering process is in part related to the time over which oil is exposed to the environment. Westridge loading operations will be conducted inside a pre-deployed boom, which would contain a release. Additional boom and response equipment, including skimmers, will be maintained on site. In the unlikely event of a spill, the responsible party (Trans Mountain for a pipeline spill, the tanker owner for a tanker spill) would work with regulatory agencies in a Unified Command to determine both response and remediation strategies appropriate for the specific circumstances of the event. Response strategies employed to avoid sinking oil are those focused on: Controlling the source of the spill</p> <ul style="list-style-type: none">- Preventing released oil from entering a waterbody- Containing, intercepting and promptly removing oil from the water surface- Removing stranded oil that could be remobilized from the shoreline. <p>The behavior and fate of spilled dilbit (bitumen blended with condensate or synthetic crude oil) was canvassed extensively in the Joint Review Panel hearings relating to Northern Gateway, and the Panel in assessing the issue accepted the following facts:</p> <ul style="list-style-type: none">- The maximum initial density of the dilbit would be 940 kilograms per cubic metre, in conformance with the proposed pipeline tariff specification. When initially spilled, the density would be less than that of fresh water or salt water, making dilbit a floating	<p>gone and apparently WCMRC will stop work. It is unfortunate for the productivity of the ecosystems that a 'do nothing' scenario for sunken oil may look attractive.</p>
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oil.

- Experts agreed that dilbit is not a simple two-phase mixture of bitumen and condensate, but is instead a new, cohesive, blended product. When spilled into water, lighter hydrocarbon fractions of the entire blend would begin to evaporate. As lighter fractions evaporate, the viscosity of the weathered dilbit would increase, and evaporation of remaining lighter fractions would be progressively inhibited.
- Past examples of spills do not indicate that products similar to dilbit are likely to sink within the timeframe for response options, or in the absence of sediment or other suspended particulate matter interactions.
- Dilbit may sink when it interacts with sediment or other suspended particulate matter, or after prolonged weathering.
- Bench-top and wave tank testing indicated that dilbit is not likely to sink due to weathering alone within a short to medium timeframe. The evidence indicated that multiple factors, such as the interaction between density, viscosity, potential emulsion formation, and environmental conditions must all be examined together in considering the fate of spilled oil, including the possibility of sinking. Much of the evidence that the Panel heard did not consider these factors collectively.
- The weight of evidence indicates that, when spilled in water, dilbit with a maximum density of 940 kilograms per cubic metre would behave similarly to an intermediate fuel oil or lighter heavy fuel oil with a density less than 1,000 kilograms per cubic metre. Various experts, including those involved in spill response, said that these products provide

		<p>reasonable analogs for dilbit behaviour as it relates to oil spill response.</p> <ul style="list-style-type: none"> - Transport Canada said that a response organization would be likely to treat a dilbit spill as a blended crude oil product spill. <p>2) Should a portion of spilled oil sink due to a combination of factors, and it could not be easily recovered during the emergency phase (such as oil in shallow water or along shorelines) it would be treated as a post emergency recovery function. Remedial actions, including actions required to recover sunken oil would be developed by the responsible party and regulatory authorities working as part in a Unified Command and would be guided by a Net Environmental Benefit Analysis (NEBA). In this respect, the approach to sunken oil remediation would be similar to cleanup of industrially contaminated sediments in waterways. Each situation will be unique and, where warranted, methods may include:</p> <ul style="list-style-type: none"> - Capturing the oil where currents and hydrographic conditions are amenable to the deployment of oleophilic material to trap the oil - Remobilization, containment and removal of the oil through agitation of sediments (raking, dragging, pneumatic agitation) - Bulk removal of the oil through pumping and/or dredging - Long-term monitoring and natural attenuation in areas where remedial actions pose more harm than benefit <p>In general, the equipment components used to recover submerged and sunken oil resides within one of the existing inventories of: a) WCMRC, b) supplemental oil spill response contractors, and c) the marine construction industry.</p>	
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13	<p>What is the KM plan to share and invite input by the public to the Oil Spill Response plan?</p>	<p>Over and above consultation with emergency management professionals and first responders in communities along the pipeline corridor, Trans Mountain has endeavoured to engage with the general public about pipeline safety and emergency response. Numerous public consultation events were held in Burnaby, BC, the neighbouring communities, and around BC's Lower Mainland since 2012. Emergency planning and response was consistently a topic presented on information boards at public events. In addition, Kinder Morgan Canada Inc. (KMC) staff with Emergency Management responsibilities attended the public events to answer questions about the emergency management program. The general public continues to engage with Trans Mountain to ask questions about emergency response via the toll free information line (1-866-514-6700) and general email (info@transmountain.com). Trans Mountain also hosted a Twitter Town Hall on the topic of pipeline safety and emergency response on October 27, 2014. A record of the tweets can be found in Consultation Update No. 3 (Filing ID A4H1W3)[see footnote¹⁶. Trans Mountain's engagement is ongoing. Trans Mountain will continue to ensure the public have an ability to engage and ask questions about Trans Mountain's pipeline safety and ERPs in the continued engagement. Additionally, Trans Mountain's Westridge plans may not address areas of specific community interest in the Burrard Inlet. Trans Mountain encourages Metro Vancouver local governments and communities to participate with WCMRC in exercises and on the development of oil spill emergency response plans including</p>	<p>This is not an adequate or full response.</p> <p>The response focuses primarily on the consultations that were done on the pipeline portion of project. Friends of Ecological Reserves has been focused on the tanker route portion of the project.</p> <p>We re-read the references provided in support of KM public consultations (Footnote 16). The clarification for Coastal Community begins on page 209 and only forest health was mentioned as a concern identified for Coastal island communities. The names of the Islands' coastal communities along the tanker route are not identified. The greater Victoria area has 13 municipalities and a population of 360,000 that can be affected by an oil spill.</p> <p>There was no mention in the answer or a reference to the open houses held on Vancouver Island, even the one that FER Board members attended at the Cedar Hill Recreation Centre in Victoria Dec 6th 2012. [Times Colonist article¹⁷ and ¹⁸] The encouragement to work with WCMRC and the transfer of all</p>
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¹⁶ Consultation Up date No 3. https://docs.neb-one.gc.ca/ll-eng/llisapi.dll/fetch/2000/90464/90552/548311/956726/2392873/2451003/2671531/B306-13_-_Trans_Mountain_Response_to_NEB_IR_No._3.005a-Attachment_1-Part_2_-_A4H1W3.pdf?nodeid=2671214&vernum=-2

¹⁷ Times Colonist article on KM open house in Victoria. <http://www.timescolonist.com/news/local/jack-knox-what-s-in-kinder-morgan-pipeline-for-victoria-1.17624#ixzz2EiYlOmD>

¹⁸ <http://www.timescolonist.com/news/local/kinder-morgan-takes-its-case-for-a-pipeline-to-the-people-1.35597>

		<p>Geographic Response Strategies (GRS) and Geographic Response Plans (GRP) for the Burrard Inlet and, based upon the community's interest, other locations in the Salish Sea.</p>	<p>responsibility to them for on spill preparedness does not match the KM message that the spill plans do not need to be public (KM¹⁹) The rationale and the need for secrecy and keeping information proprietary to KM has not been made, nor does it match what WCMRC states. (see question 15 on transparency and consultations).</p>
14	<p>How many ships contracted by KM were inspected by the Canadian Coast Guard (CCG) since 2010 and were any assessed as substandard? 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>	<p>Port State Control inspections in Canada are carried out by Transport Canada. Transport Canada inspects a tanker on its first call to Canada and thereafter once a year. Trans Mountain does not have records of the exact number of times vessels at the Westridge Marine Terminal were inspected by Transport Canada. No vessel at the Westridge Marine Terminal has been assessed as substandard. Please note the IMO's definition of Substandard ship: A ship whose hull, machinery, equipment or operational safety is substantially below the standards required by the relevant convention or whose crew is not in conformance with the safe manning document.</p> <p>Please refer to FER IR No. 2.14 - Attachment 1.</p>	<p>It is an adequate response but not what we unexpected response.</p> <p>What was expected was information to reassure FER and the public that even though CCG has the legal authority to check vessels, KM does not rely on this for quality assurance on their contracted tankers. We expected but now understand that there are not professional standards or Standard Operating Procedures (SOP) used by KM for contracting ships to ensure that they are sea worthy and will never be assessed as substandard if CCG inspected. So therefore it seems lowest cost and most convenient tankers override all concerns. No evidence to the contrary has been provided. Solely relying on the CCG to audit the quality and adequacy of ships contracted by KM is not at all reassuring.</p>

¹⁹ KM president says plans do not need to be public. <http://www.ctvnews.ca/politics/kinder-morgan-president-says-b-c-spill-plan-doesn-t-need-to-be-public-1.2246048>

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 Worse 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:</p> <p>We (Western Canada Marine Response Corporation) value:</p> <ol style="list-style-type: none"> 1. Open and honest communication that fosters a climate of trust. 2. Integrity in all our business practices 3. Being a steward of the environment 4. Success through competency, creativity and teamwork 5. Celebrating individual and team successes. <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</p>	Please refer to response to FER IR No. 2.13	<p>This is not considered an adequate or full response.</p> <p>See 13 for evidence to support this assessment.</p>
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	the public and intervenor that are at undisclosed financial, environmental and cultural risk and need disclosure of the WCMRC Oil Spill Response Plan		
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 Financial Vulnerability Assessment: Who Would Pay for Oil Tanker Spills Associated with the Northern Gateway Pipeline? This report was prepared For Living Oceans Society with supervision from the University of</p>	<p>References provided.²⁰ A tanker based spill is governed by a compensation regime under the Marine Liability Act. Under those provisions, the tanker owner is liable for spills and regarded as the Responsible Party for insurance purposes. The coverage of the cost of an oil spill arising from an offshore spill is described in Volume 8A, Section 1.4.1.6 of the Application (PDF page 43 in Filing ID A3S4X3)²¹; funding thresholds and limitations are elaborated in Volume 8A, Section 5.5.3 of the Application (PDF pages 3-4 in Filing ID A3S5Q3)²². Compensation mechanisms are governed through provisions in the International Oil Pollution Compensation Fund (IOPCF) and Canada’s complementary Ship-source Oil Pollution Fund (SOPF). The IOPCF consists of two Funds: the 1992 IOPC Fund and the 2003 Supplementary Fund. Canada has access to both of these funds. The IOPCF Claims Manual (Filing ID A3X5W1)²³ provides additional information on claims procedures and eligible costs. Canada’s SOPF Claims Manual 2014 (FER IR No. 2.16 - Attachment 1) provides complementary information.</p>	<p>This is an adequate answer.</p> <p>There remains a concern with regard to the Canadian government paying premiums for industry and has been doing so since 1979 on 30 million dollars worth of funds put up by industry. We understand that Canadians have paid 500 million dollars and industry has paid nothing in addition to the original 30 million dollars.</p> <p>We are unclear on the degree to which Canadians need to subsidize oil spill insurance.</p>

²⁰ Ship-source Oil Pollution Fund. 2014. Claims Manual 2014 Edition. Administrator of the Shippers Oil Pollution Fund. Ottawa. Website: <http://sopf.gc.ca/about-us/publications/sopfclaims-manual-2014-edition> (Accessed January 2015).

Tanker Safety Expert Panel. 2013. A Review of Canada’s Ship-source Oil Spill Preparedness and Response Regime: Setting the Course for the Future. Appendix 1 – List of Recommendations. Transport Canada. Ottawa. Website: <http://www.tc.gc.ca/eng/tankersafetyexpertpanel/menu.htm>

²¹ https://docs.neb-one.gc.ca/ll-eng/llisapi.dll/fetch/2000/90464/90552/548311/956726/2392873/2451003/2393783/B18-19 - V8A_1.0_TO_1.4.2.6_MAR_TRANS_ASSESS - A3S4X3.pdf?nodeid=2393057&vernum=-2

²² https://docs.neb-one.gc.ca/ll-eng/llisapi.dll/fetch/2000/90464/90552/548311/956726/2392873/2451003/2393783/B18-33 - V8A_5.5.2_F5.5.2_TO_5.6.2.2_MAR_TRANS_ASSESS - A3S5Q3.pdf?nodeid=2393564&vernum=-2

²³ CLAIMS MANUAL https://docs.neb-one.gc.ca/ll-eng/llisapi.dll/fetch/2000/90464/90552/548311/956726/2392873/2451003/2478117/B40-3 - Trans_Mountain_Response_to_Allan_R_IR_No._1.21j-Attachment1 - A3X5W1.pdf?nodeid=2478325&vernum=-2

<p>Victoria Environmental Law Centre. This report raises concerns that the KM is subject to the same limitations found in the Northern Gateway process when it comes to a major oil spill. Boulton states “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” 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</p>	<p>Diluted bitumen spills are covered under the insurance regime in place. For tariff purposes, diluted bitumen is regarded as a blended Petroleum, which given its physical properties constitutes it as falling into a category of heavy oils. The compensation regime distinguishes only between persistent and non-persistent oils, and heavy oils are treated as persistent in this context. Spill costs are covered under the IOPCF for persistent oils; spill costs are covered under Canada’s SOPF for both persistent and non-persistent oils. A diluted bitumen spill would thus be covered under both the IOPCF and SOPF. To date, no spill in Canada has exceeded the funds available. Moreover, in the jurisdiction of the IOPCF, no single spill has exceeded funds available from the funds to which Canada has access (1992 IOPC Fund plus the 2003 Supplementary Fund).</p> <p>Trans Mountain cannot speculate as to how or if the Government of Canada would choose to further extend compensation frameworks in the event that spill costs exceeded current caps. There are various options available now, and additional options are expected to be available in the future.</p> <p>The Tanker Safety Expert Panel recommended (Recommendation 23) that caps to the SOPF be removed and that the SOPF be able to access Canada’s Consolidated Revenue Fund through loans that would be reimbursed with interest from future revenues of levies on oil transported by ship to, from and within Canada. Trans Mountain supports Recommendation 23 of the Tanker Safety Expert Panel, which specifically reads as follows (Appendix 1 – List of Recommendations, Filing ID A3Y2J1)²⁴ :</p> <p>The current limit of liability per incident within the Ship-</p>	
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²⁴ <https://docs.neb-one.gc.ca/ll-eng/llisapi.dll/fetch/2000/90464/90552/548311/956726/2392873/2451003/2482799/B122-2 - Trans Mountain Response to Del Ponte IR No.1.5h-Attachment1 - A3Y2J1.pdf?nodeid=2482373&vernum=-2>

	<p>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>	<p>source Oil Pollution Fund should be abolished. The Fund should process and pay for all admissible claims, subject to the Consolidated Revenue Fund’s consent to loans in favour of the Ship-source Oil Pollution Fund for amounts sufficient to allow all admissible claims to be paid to claimants. The loans would be reimbursed with interest to the Consolidated Revenue Fund from future revenues of levies on oil transported by ship to, from and within Canada.</p>	
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? 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>	<p>In 2013, WCMRC initiated the development of a new coastal mapping system. This new system, still under development, will house not only coastal sensitivities and associated Geographic Response Strategies (GRS) but also all associated logistical support information. Shoreline sensitivities, as noted above, form part of WCMRC’s mapping database. GRS is a plan used for the initial nearshore response in an emergency situation. The program utilizes local knowledge to assist in shoreline sensitivity classification to possible oiling. As for shoreline protection strategies, these are built, in conjunction and/or reviewed with local stakeholders (e.g., Emergency Planners/First Nations) to address the sensitivities that have been identified as part of the coastal</p>	<p>The is a partial response and not adequate.</p> <p>We are pleased to hear about a new inventory system WCMRC is involved with but request more details of the proposed new system and who is involved and a time line.</p>

		<p>mapping project. Each sensitivity has a corresponding geographic response strategy and protective assignment developed and ready to be implemented in the event of a spill. Each feature is then field-tested and a two-page reference document is developed and reviewed with government agencies. The goal of a GRS is to protect sensitive natural and cultural features while reducing decision-making time during an actual spill. GRSs are designed to provide all the necessary information required to carry out an efficient and rapid shoreline response. Cleanup endpoints and post-spill monitoring regarding ecological restoration or recovery are typically set to best restore habitat use. These incident-specific goals are determined by a Net Environmental Benefit Analysis as detailed in the response to FER IR No. 2.01</p>	
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>	<p>From the intervenor’s reference in the preamble to “The public appears to be the last party able to make a draw for costs of a spill”, Trans Mountain assumes that this information request pertains to oil spill compensation from the International Oil Pollution Compensation Fund (IOPCF). A chart is not required to convey the requested information. British Columbia Ministry of Environment is responsible for the management and protection of ecological reserves; a spill will not change the mandate to protect these reserves. A tanker based spill is governed by a compensation regime under the Marine Liability Act. Under those provisions, the tanker owner is the Responsible Party. Compensation mechanisms are defined through provisions in the International Oil Pollution Compensation Fund (IOPCF) and Canada’s complementary Ship-source Oil Pollution Fund (SOPF). Eligible spill costs under these mechanisms include clean-up costs of protected areas. The coverage of the cost of an oil spill arising from an offshore spill is described in Volume 8A, Section 1.4.1.6 (Filing ID A3S4X3). Trans</p>	<p>This is an adequate response.</p> <p>We are pleased to learn that study costs are an eligible claim post spill as this is of relevance to Ecological Reserves. Ecological Reserves are set up as environmental benchmarks and areas for natural systems research.</p> <p>We continue to advocate for a monitoring program of Ecological Reserves and other environmental indicators pre spill.</p>

		<p>Mountain notes that the IOPCF Claims Manual (Filing ID A3X5W1) provides additional information on claims procedures and eligible costs. Eligible costs include clean-up costs and costs of reasonable reinstatement measures. Of key note is that study costs are also an eligible expense during the recovery period of sensitive systems. The Claims Manual indicates (pp 39-40): 3.6.10 The Fund should be invited at an early stage to participate in the determination of whether or not a particular incident should be subject to a post-spill environmental study. If it is agreed that such a study is justified, the Fund should then be given the opportunity of becoming involved in planning and establishing the terms of reference for the study. In this context the Fund can play an important role in helping to ensure that any post-spill environmental study does not unnecessarily repeat what has been done elsewhere. The Fund can also assist in ensuring that appropriate techniques and experts are employed. It is essential that progress with the studies is monitored, and that the results are clearly and impartially documented. This is not only important for the particular incident but also for the compilation of relevant data by the Fund for future cases.</p>	
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? 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>	<p>By “distillate”, Trans Mountain assumes that the intervenor is referring to the typically diluted bitumen diluent, which is natural gas condensate (condensate). Condensate is a low-density mixture of hydrocarbon liquids that are present as gaseous components in the raw natural gas produced from many natural gas fields. It condenses out of the raw and is collected in liquid form. Producers of diluted bitumen products obtain condensate from national and international sources to use as a diluent in diluted bitumen products. Westridge Marine Terminal is not equipped to receive any hydrocarbon product other than jet fuel and Trans Mountain does not produce or supply condensate to diluted bitumen</p>	<p>Inadequate answer because the source and transport of diluent remains undisclosed. Is this transported by rail and where does it originate?</p> <p>We believe that the KM project is responsible for disclosing and addressing the environmental impact of distillate as well as export dilbit. We understand from an article From The Tyee that: <i>Until 2005, Canada produced enough of its own condensate to export the tarry</i></p>

	<p>producers.</p>	<p><i>product. But as raw bitumen exports grew by leaps and bounds, industry experienced a widespread diluent shortage. At first industry imported condensate from the U.S. When that didn't satisfy demand, a hefty volume of "non-NAFTA diluent began entering the western Canadian diluent pool," or more than 78,000 barrels a day. Much of it poured through the port of Kitimat, B.C. There it was loaded on train cars and shipped to Fort McMurray. A lot of this condensate came from Asia, the Middle East, Venezuela, Peru, Bolivia and even Pakistan.*</i></p> <p>Is TMX saying that all the condensate that will be used for the TMX pipeline will be found on site in Alberta?</p> <p><i>In the event of a spill to water, it is possible that large portions of dilbit will sink and that submerged oil significantly changes spill response and impacts. We also recommend that the Final EIS include means to address the additional risks of releases that may be greater for spills of dilbit than other crudes. For example, in the Enbridge spill, the local health department issued voluntary evacuation notices based on the level of benzene measured in the air.</i></p>
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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>	<p>From the background to this information request Trans Mountain assumes that the information requested pertains to marine oil spills. Based on an evaluation undertaken by Western Canada Marine Response Corporation (WCMRC), Trans Mountain has proposed an enhanced marine oil spill response regime in the Application to the National Energy Board which will be implemented by WCMRC. A summary of proposed improvements to WCMRC's capacity can be found in Volume 8A, Table 5.5.3 (Filing ID A3S4Y6²⁵).</p>	<p>This is not an Adequate response.</p> <p>Table 5.5.3 PROPOSED IMPROVEMENTS TO WCMRC'S EMERGENCY RESPONSE CAPACITY is not reassuring as the maintenance of MPV capacity is MPV centred for WCMRC whereas the risk is on Vancouver Island. This does not match need to have a majority of the deployments for WCMRC be located in Sidney on Vancouver Island and further west in the Sooke Area. There is no recognition of a need to centre infrastructure on Vancouver Island.</p> <p>We were quite specific in asking about human safety and harm to the environment from release of toxic substances.</p> <p>We also remain concerned that the toxic elements and human health are unstated. As Pointed out by another intervenor :</p> <p>http://docs.neb-one.gc.ca/fetch.asp?language=E&ID=A66296 1.16</p> <p>ii. Unpublished Canadian Department of Fisheries and Oceans Report:</p> <p><i>"Ecotoxicological Impacts of Aquatic Contaminants Related to Oil and Gas Resource Development"</i> prepared by</p>
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²⁵ https://docs.neb-one.gc.ca/ll-eng/llisapi.dll/fetch/2000/90464/90552/548311/956726/2392873/2451003/2393783/B18-32 - V8A_5.4.4.7.2_TO_T5.5.3_MAR_TRANS_ASSESS - A3S4Y6.pdf?nodeid=2393683&vernum=-2

		<p><i>Aquaponika Ltd. that focuses most of its attention on what's not known about bitumen's properties including: no peer-reviewed reports on possible toxic biological effects; little on how bitumen or dilbit behaves in water; no studies on how the different concentrations of metals in bitumen behave compared with those in conventional oil; little known on how condensate used to dilute bitumen for transport behaves in a body of water; no studies on the specific ways bitumen interact with living organisms; not enough research on airborne toxicity associated with the tar sands not enough research on the interaction of bitumen, the environment and dispersants; and little known about behavior of bitumen in the icy, dark waters of the Canadian Arctic.</i></p> <p>Although this appears to deal with the Arctic it appears that uncertainty may easily extend to other scientific research on Dilbit.</p> <p>Can you please provide access to this document and indicate how its recommendations are different from those you have presented.</p> <p><i>"We have learned from the 2010 Enbridge spill of oil sands crude in Michigan that spills of diluted bitumen</i></p>
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			<p><i>(dilbit) may require different response actions or equipment from response actions for conventional oil spills. These spills can also have different impacts than spills of conventional oil. [...]</i></p>
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/ll-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)----3. Absence of known marine bird colonies as indicators for long term monitoring and reporting of marine health. The erratum to the earlier response was a change in the removal of the phrase “less than 5% of the shipping route”. "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,</p>	<p>In the Canadian portion of the Marine Regional Study Area (RSA), the total length of shoreline is approximately 2,315 km. Of this, 108.9 km (4.7%) lie within 2 km of the shipping lanes. In the United States (US) portion of the Marine RSA, the total length of shoreline is 1,546 km. Of this, 9.8 km (0.6 %) lie within 2 km of the shipping lanes. The combined length of the inbound and outbound shipping lanes is approximately 592.8 km. Of this, 75.3 km is within 2 km of Canadian shoreline and 16.9 km is within 2 km of US shoreline. In total, approximately 92.2 km (15.6%) of the shipping lanes are within 2 km of shoreline (see Attachment 1).</p> <p>The following ecological reserves are located within 2 km of the shipping lanes (refer to FER IR No. 2.21 - Attachment1) Included in end note^v:</p> <ol style="list-style-type: none"> 1. Oak Bay Islands Ecological Reserve (Canada); 2. Discovery Island Marine Park (Canada); 3. Trial Islands Ecological Reserve (Canada); 4. Eastern Burrard Inlet Rockfish Conservation Area (Canada); 5. Saturna South Rockfish Conservation Area (Canada); 6. Bedwell Harbour Rockfish Conservation Area (Canada); 7. Brethour, Domville, Forrest, and Gooch Islands Rockfish Conservation Area (Canada); 8. D’Arcy Island to Beaumont Shoal Rockfish Conservation Area (Canada); 9. Discovery and Chatham Islands Rockfish Conservation Area (Canada); 	<p>Adequate response and the new information has been supplied as was requested.</p> <p>However we believe that the southern boundary of Race Rocks ER is ocean floor and is very close to the 2 km corridor of the outbound shipping lane even if the Rocks themselves are greater than 2 KM.</p> <p>Also note that 11 of the areas listed have high conservation values and protections similar to ERs though they are not managed as ERs.</p> <p>Finally in the shipping route map provided, it is unclear why laden tankers follow the shore off Victoria and make extra course changes to do this. It would be safer if the shipping lanes has fewer course changes and remained further offshore at Victoria.</p> <p>Is this for the convenience of dropping off and picking up pilots? It is unclear why tankers are not required to stay further off shore when it is possible to do so especially in a highly populated area.</p>

<p>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>	<p>Both credible worst-case and smaller spills have also been considered. Sections 5.3.1 of both Technical Report TR 7-1 of Volume 7, Ecological Risk Assessment of Westridge Marine Terminal Spills (Stantec Consulting Ltd. December 2013; Filing ID A3S4X1)²⁷, and Technical Report 8B-7 of Volume 8A, Ecological Risk Assessment of Marine Transportation Spills (Stantec Consulting Ltd. December 2013; Filing ID A3S4K7)²⁸ provide a summary of methodology for defining shoreline types within the RSA, and the associated biological habitats and sensitivity ranking for each shoreline type. Results of the seasonal stochastic assessment of a 160m 3 crude oil spill at the Westridge Marine Terminal are provided in Section 6.2 of the TR7 -1 (Filing ID A3S4X1). Stochastic assessment results for credible worst-case and smaller spills originating at Strait of Georgia, Arachne Reef and Race Rocks are provided in Sections 6.2, 7.2 and 8.2 respectively of Technical Report 8B-7 (Filing ID A3S4K7). Methods for estimating crude oil retention on various shoreline types, and benchmarks for evaluating effects to the intertidal zone are also discussed in Section 3.4.4.5 of the Detailed Quantitative Ecological Risk Assessment (DQERA) (Filing ID A3W9K1). Potential effects to intertidal communities from shoreline oiling following deterministic modelling of a 160 m3 spill at WMT are summarized in Section 4.4.5 of the DQERA (Filing ID A3W9K4). Potential effects to intertidal communities from shoreline oiling following deterministic modelling of an 8,250 m3 spill and a 16,500 m3 spill from a tanker accident at Arachne Reef are summarized in Sections 5.3.5 and 5.4.5 of the DQERA (Filing ID A3W9K5).</p>	<p>Scenario and</p> <p>3) that there are no spill simulations near Oak Bay Islands ER to show what may happen to the Victoria waterfront.</p>
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²⁷ https://docs.neb-one.gc.ca/ll-eng/llisapi.dll/fetch/2000/90464/90552/548311/956726/2392873/2451003/2393783/B18-17 - V7_TR_72_ERA_WESTRIDGE - A3S4X1.pdf?nodeid=2393881&vernum=-2

²⁸ 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

24	<p>Please explain what is meant by the line "weather permitting and subject to the requirements identified in a future Pacific Pilotage Authority 'Notice to Industry'. 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 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: 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) 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'. To which TMX replied: (3.2.4 Proposed Risk Mitigation Measures) Trans Mountain is pleased with the TRC's support for</p>	<p>a) This pertains to laden outbound tankers and refers to extending the pilot disembarkation point to the vicinity of Race Rocks, which was agreed to by the Pacific Pilotage Authority and British Columbia Coast Pilots at the request of Trans Mountain. Extending the pilot disembarkation position for Trans Mountain tankers does not mean that the current established pilot disembarkation position near Victoria) will be moved to Race Rocks. That position is marked on navigation charts and is applicable to all vessels. It means that when conditions allow, the pilots will disembark in an area in the vicinity of Race Rocks. This caveat has been included by the TERMPOL Review Committee in order to ensure that the pilots are able to disembark the vessel safely, which in future is planned to be carried out using helicopter. The current pilot disembarkation point off Victoria is relatively sheltered and pilot disembarkation by launch can be safely carried out. In fact, there are no records of any weather delays under current operating procedures. Because the area. near Race Rocks is more exposed to stronger winds from the Juan de Fuca Straits, disembarking to a pilot launch was not considered feasible and Pilot disembarkation at Race Rocks is expected to be undertaken by helicopter. Should weather at Race Rocks not allow safe disembarkation at Race Rocks, the pilot will, at the pilot and master's discretion, disembark at the normal established location.</p> <p>b) 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? Trans Mountain has committed to develop criteria for tug escort based on weather criteria. Please refer to response to NEB IR No. 1.59a (Filing ID A3W9H8) for more details. Such</p>	<p>This is not an adequate response.</p> <p>This is a confusing answer and we remain unclear about the line in the response "Because the area near Race Rocks is more exposed to stronger winds from the Juan de Fuca Straits, disembarking to a pilot launch was not considered feasible and Pilot disembarkation at Race Rocks is expected to be undertaken by helicopter." (However) <i>Should weather at Race Rocks not allow safe disembarkation at Race Rocks, the pilot will, at the pilot and master's discretion, disembark at the normal established location."</i></p> <p>Something there doesn't make sense. So if the weather is bad (and a six knot current is running with 6 metre seas , then just let that captain go it alone because its just too risky to send out a pilot and get him extracted safely by helicopter, whereas if a ship is big enough it can handle anything.....)</p> <p>Knowing the waters around Race Rocks, this is just not adequate planning, and whether it's the TERMPOL Review Committee, the CCGs responsibility or Kinder Morgan's, this one needs a bit more work in our opinion.</p>
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	<p>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</p>	<p>criteria will be in place prior to commissioning of the project, if approved.</p>	
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>	<p>By "any of the toxic components of Dilbit" Trans Mountain assumes that the intervenor is referring to the Dilbit diluent, which is described in the response to FER IR No. 2.19. As the Project is not designed to import hydrocarbons, the inbound tankers will be empty and, as is current practice, pilots will board at the established pilot boarding point located at Brotchie Ledge, near Victoria.</p>	<p>We accept that dilutents are not imported to Westridge.</p> <p>See concerns about importation of diluents in IR #19.</p>
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>	<p>Laden tankers sailing outbound from Westridge Marine Terminal in Burnaby are under the direction of two pilots and under tug escort as described in Volume 8A, Section 1.4.1.3 (Filing ID A3S4X3). Currently Westridge Marine Terminal handles about 60 tankers a year and the maximum size is the Aframax tanker, which tanker size is not expected to change as part of the Project. If the Project is approved, in the future all laden tankers from Westridge Marine Terminal will be subject to all the proposed and accepted additional risk mitigation measures described in the Application and TERMPOL reports.</p>	<p>Adequate response.</p> <p>We now understand size and number of dilbit tankers currently exiting Juan de Fuca Strait and linked to Westridge operations pre project.</p> <p>We also learned the improvements to reduce risk are not in place.</p>
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</p>	<p>The configuration and capability of the existing fleet has and continues to evolve to meet the requirements of the local market. In recent years the two established tug operating companies who provide the escort service (Seaspan Marine and SMIT Marine Canada) have both invested in new equipment to meet changing demands of the local market.</p>	<p>This is not an adequate answer.</p> <p>The concerns raised about number of International Tugs of Opportunity System (ITOS) in the study we cited (footnote 27), as well as the absence of an</p>

	<p>of Local Escort and Rescue Tug Capabilities in Juan de Fuca Strait Project 213-063 Revision 3 November 27, 2013²⁹. 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>	<p>Both companies are aware of the requirements of TMEP tankers and have provided letters expressing their ability and interest in providing tug escort services for Project related tankers. Copies of these letters are attached as NEB IR No. 1.59b – Attachment 1 (Filing ID A3W9J9) and NEB IR No. 1.59b – Attachment 2 (Filing ID A3W9K0). Please also refer to responses to NEB IR No. 1.59a and 1.59b (Filing ID A3W9H8).</p>	<p>Automatic Identification System (AIS), means that it is impossible to identify real towing capabilities of tugs within the vicinity of an incident. Even today we are ill prepared for a marine oil tanker incident.</p>
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 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</p>	<p>This information request is answered in several parts: a) 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? All vessels across the world, including Canada, requires under law that mariners follow the International Regulations for Preventing Collisions at Sea (COLREGS). Rule 6 mandates that “Every vessel shall at all times proceed at a safe speed so that she can take proper and effective action to avoid collision and be stopped within a distance appropriate to the prevailing circumstances and conditions”. Safe speed is determined by the master and pilot. Tanker speed in Vancouver harbour is kept to about 6 knots. Speed of tankers along the shipping route are generally expected to be in the range of 10-14 knots, depending on weather conditions, requirements of escort tugs, maneuvering</p>	<p>This has not been adequately answered.</p> <p>Please explain the rationale why the WCMRC 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>From our question : <i>“The modelling done on potential mechanical malfunctions such as loss of rudder, shows that a tanker can be grounded within 14 minutes. Please provide similar modelling such as this for the Eastern entrance of</i></p>

²⁹ Robert Allan Ltd 2013 An Evaluation of Local Escort and Rescue Tug Capabilities in Juan de Fuca Strait <https://docs.neb-one.gc.ca/ll-eng/llisapi.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>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/lleng/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>	<p>conditions, etc.</p> <p>b) 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. A Project-related tanker losing propulsion or steering or both in the vicinity of Race Rocks is a very low likelihood event. However, in order to ensure due diligence and explore the consequence of such an occurrence, navigation simulation modeled upon extremely conservative but credible assumptions was carried out and submitted to TERMPOL. The simulation results have been considered and addressed in the additional precautionary measures proposed by Trans Mountain including the expansion of escort tug use. Trans Mountain believes that diligent evaluation and determination of the consequence of machinery failure onboard a partly loaded Aframax tanker as proposed by the Project has been conducted, which meets the National Energy Board's filing requirements. Further modeling as requested by the intervenor will therefore not be undertaken. It was also unclear from the modelling what the acceptable speed of tankers are in Canadian waters. Please refer to response to FER IR No. 2.28a.</p> <p>d) 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/wpcontent/uploads/2013/06/WCMRC-Information-Handbook-2012.pdf) Western Canada Marine Response Corporation (WCMRC) must demonstrate compliance with Transport Canada (TC) regulations governing certified Response Organizations (RO). To</p>	<p><i>the Strait of Juan de Fuca, off Race Rocks Ecological Reserve and for Haro Strait off Oak Bay Islands Ecological Reserve. It was unclear from the modelling what the acceptable speed of tankers is in Canadian waters.”</i> For the Race Rocks or Oak Bay Islands Ecological Reserve this essentially means there is no protection possible and no possibility of any mitigation in the event of a catastrophic event. We find this to be totally unacceptable.</p> <p>Further, mentioning all the information about PMV along the tanker route, is not relevant to us. It makes for further unnecessary reading to reply to the question asking about the Strait of Juan de Fuca. Please be more direct. If you cannot ensure protection (for instance tethered tug assistance well beyond Race Rocks), be straight up about it and indicate so.</p> <p>Your statement <i>“Trans Mountain believes that diligent evaluation and determination of the consequence of machinery failure onboard a partly loaded Aframax tanker as proposed by the Project has been conducted, which meets the National Energy Board's filing requirements. Further modeling as requested by the intervenor will therefore not be undertaken.”</i></p>
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become a certified RO, WCMRC must adhere to planning standards published by Transport Canada (TC). Planning standards are established benchmarks around which ROs build their response systems. Planning standards are not performance standards. A summary of current federally mandated response times and capacity requirements is provided in the Table below:

Area Type	Response Organization Tier 1 150 tonnes	Response Organization Tier 2 1,000 tonnes	Response Organization Tier 3 2,500 tonnes	Response Organization Tier 4 10,000 tonnes
Designated Port (PMV)	Deployed on-scene in Designated Port (dedicated resident equipment) 6 hours from time of notification	Deployed on-scene in Designated Port 12 hours from time of notification	Not Applicable	Not Applicable
Inside PAR/ERA	Not Applicable	Not Applicable	Delivered on-scene within the PAR/ERA from time of notification 18 hours	Delivered on-scene within the PAR/ERA from time of notification 72 hours
Outside PAR/ERA Inside PAR/ERA ; Outside PAR/ERA ; Inside GAR	Not Applicable	Not Applicable	Delivered on-scene 18 hours from time of notification plus travel time	Delivered on-scene 72 hours from time of notification plus travel time hours

Under the proposed response system enhancements to support the Project, the following voluntary response times have been proposed:

- Within the Port of Vancouver (existing boundaries including Delta Port) - two hours to commence response on a spill up to 2, 500 tonnes size.
- Outside Port of Vancouver to “J” Buoy - six hours to commence response on a spill up to 2, 500 tonnes size.
- Additional equipment necessary to deal with a 20,000 tonne oil spill will be cascaded in within 36 hours of initial notification for entire IRA.
- Offshore of Buoy “J” (outside IRA) existing legislated response time (72-hours + travel time) will remain in

		effect.	
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>	<p>On June 21, 2010, the British Columbia Environmental Assessment Office (EAO) and the National Energy Board (NEB) entered into an agreement (NEB-EAO Agreement) which states the EAO will accept the NEB's environmental assessment of a proposed project (that otherwise would have to be reviewed under BC's Environmental Assessment Act) as an equivalent assessment, and that the proposed project may proceed without a provincial environmental assessment certificate. The Trans Mountain Expansion Project is subject to this NEB-EAO Agreement. Accordingly, the information request is speculative in nature and not relevant to one or more of the issues identified in the NEB's List of Issues for the Trans Mountain Expansion Project (Filing ID A3V6I2).</p> <p>Reference: British Columbia Environmental Assessment Office. 2015. Agreement and Project Listing. http://www.eao.gov.bc.ca/EAO_NEB.html . Date Acquired: January 21, 2015.</p>	<p>This an unacceptable answer.</p> <p>We do not believe that submitting of numerous consultants reports are an environmental assessment. Where is the NEB's environmental assessment as you state the EAO will accept the NEB's environmental assessment of a proposed project that otherwise would have to be reviewed under BC's <i>Environmental Assessment Act</i>) as an equivalent assessment?</p> <p>If the Stantec reports are considered to be all the environmental assessment that is required, then we would submit that they are wholly inadequate.</p> <p>If the link provided to the NEB site is supposed to provide us with the details of an Environmental assessment process that has been completed, then you will have to help us find that information more directly as there is nothing substantive on that NEB page about Environmental impact assessment.</p>
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</p>	<p>An existing regulatory framework emphasizing navigational safety, accident prevention, emergency preparedness and response, and financial liability/compensation in the case an oil spill in a marine environment in Canada governs existing and future marine vessel traffic calling at the Westridge Marine Terminal. Shipping activities within the jurisdiction of Canada are regulated through various legislative tools. Acts,</p>	<p>This is an inadequate answer.</p> <p>Important new information has been made available from DFO which has implications for IR#2 questions and responses for 30, 31 and 32. We have included this as endnote 6. We now ask</p>

<p>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: "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 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</p>	<p>regulations and international conventions that are relevant to Project-related marine transportation are briefly described in Section 1.4.1 of Volume 8A (Filing ID A3S4X3). Additional legislative and policy tools to manage and mitigate threats to marine mammals include (but are not limited to) the following:</p> <ul style="list-style-type: none"> • the federal Fisheries Act, 1985 and associated Marine Mammal Regulations, with respect to disturbing a marine mammal in Canadian waters; • the federal Species at Risk Act, 2002 (SARA), which includes prohibitions against killing, harming, harassing, capturing or taking an individual of a wildlife species that is listed as endangered or threatened; • Be Whale Wise Marine Wildlife Guidelines for Boaters, Paddlers and Viewers; • Wild Salmon Policy (Fisheries and Oceans Canada [DFO] 2005); • DFO Integrated Fisheries Management Plans; • management of marine mammal species within the context of any relevant recovery strategies or management plans, and in consideration of key threats identified in such plans; and • consideration of the Endangered Species Act, 1973 and Marine Mammal Protection Act, 1972 with respect to disturbing a marine mammal in US waters <p>Reference: Fisheries and Oceans Canada. 2005. Canada's Policy for Conservation of Wild Pacific Salmon. Fisheries and Oceans Canada. Vancouver, BC. Cat. No. Fs23-476/2005E. 57 pp.</p>	<p>TMX to re-evaluate their responses in light of this information.</p> <p>TMX demonstrates understanding of existing legislation and government responsibility. But we found no commitment in solving the problem for the Southern Killer Whale. The statement "<i>the existing regulatory framework emphasizing navigational safety, accident prevention, emergency preparedness and response, and financial liability/compensation in the case of an oil spill in a marine environment in Canada governs existing and future marine vessel traffic calling at the Westridge Marine Terminal.</i>" Neither the other responsibilities of DFO nor existing Acts have been entirely successful at stemming the slide toward extinction of this species.</p> <p>The legislative tool you mention, "<i>the federal Species at Risk Act, 2002 (SARA), includes prohibitions against killing, harming, harassing, capturing or taking an individual of a wildlife species that is listed as endangered or threatened.</i>" If we are serious about it and if it was enforced, it would mean that any level of increase in shipping through the habitat of this whale could only occur if there was NO NET LOSS of habitat, and that means no net loss of ability for the</p>
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	<p>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>		<p>animals to echolocate, find food and reproduce in a healthy environment.</p> <p>So we would expect that :</p> <ol style="list-style-type: none"> 1: Your operation (and this involves the transport component, not just the Westridge component, will not add to the interference in the soundscape of the area. (as referenced in IR2 #32) 2. Your operation will not produce any addition to the chronic oil pollution problem of the area. 3. Your operation will be able to guarantee zero collisions with marine mammals. 4. Your operation will cause zero addition to atmospheric emissions in the waters of their habitat. For the problems here see http://ecoreserves.bc.ca/2008/06/30/a-model-based-approach-investigating-killer-whale-orcinus-orca-exposure-to-marine-vessel-engine-exhaust/
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</p>	<p>Please see the subsection ‘Contribution to Southern Resident Killer Whale Recovery Strategies’ in Marine Mammal Protection Program framework provided in the response to NEB IR No. 1.56 (Filing ID A3W9H8³⁰). In brief,</p>	<p>This is not an adequate answer.</p> <p>Important new information has been made available from DFO which has</p>

³⁰ <https://docs.neb-one.gc.ca/ll-eng/llisapi.dll/fetch/2000/90464/90552/548311/956726/2392873/2451003/2454322/B32-2 - Trans Mountain Response to NEB IR No. 1 1 of 2 - A3W9H8.pdf?nodeid=2456419&vernum=-2>

	<p>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>	<p>this subsection of the Marine Mammal Protection Program states that recovery measures identified in the action plan demonstrate that recovery of at-risk whale populations in the Salish Sea is a complex and multi-faceted problem, and that integrated, multi-party solutions are required. As cumulative effects management is most effective when all parties contribute to solutions, Trans Mountain has proposed specific actions as part of a Marine Mammal Protection Program for three of the four objectives outlined in the action plan.</p>	<p>implications for IR#2 questions and responses for 30, 31 and 32. We have included this as endnote 6. We now ask TMX to re-evaluate their responses in light of this information.</p> <p>The response is correct in observing that this is a <i>"complex and multi-faceted problem,"</i> and that is why it requires a <i>"complex and multi-faceted solution"</i>, keeping in mind at all times that the "Precautionary Principle" is the baseline as stated in the Oceans Act included in endnote 2.</p> <p>By saying <i>"Trans Mountain has proposed specific actions as part of a Marine Mammal Protection Program for three of the four objectives outlined in the action plan,"</i> please be specific which objectives have been addressed and how and which objective has not been addressed and why not?</p> <p>For instance do any of these specific actions relate to the threshold of sound allowable from Tanker Traffic? Information on whales is provided in end note ^{vi}</p>
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</p>	<p>Sensory disturbance caused by underwater noise from vessel traffic, including tankers and tugs, is a concern for the maritime industry as a whole. Port Metro Vancouver (PMV) is engaged in working collaboratively with regulators and industry to develop future guidelines or standards for</p>	<p>This response is inadequate as it seems to think that the PMV can adequately represent the tanker route through the Strait of Juan de Fuca.</p>

<p>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).</p>	<p>reducing underwater noise from commercial vessels in local waters. Once such guidelines are available, Trans Mountain, as part of its Tanker Acceptance Standards, shall require Project tankers to adopt those as best practice as far as practical. PMV has established the Enhancing Cetacean Habitat and Observation (ECHO) Program in collaboration with government agencies, First Nations, marine industry users, non-government organizations and scientific experts, to better understand and manage the potential impacts to cetaceans from commercial vessel activities in BC coastal waters. In addition, PMV participates in Green Marine, a voluntary environmental program for the maritime industry to reduce its environmental footprint. Trans Mountain is participating in both initiatives and continues to raise awareness of such initiatives with its shippers and carriers, with the aim to promote the selection and nomination of modern and efficient vessels operated to current best practices and meeting all local and international regulations. Further details on the Marine Mammal Protection Program that will be adopted by Trans Mountain are provided in the response to NEB IR No. 1.56 (Filing ID A3W9H8).</p>	<p>Important new information has been made available from DFO which has implications for IR#2 questions and responses for 30, 31 and 32. We have included this as endnote 6. We now ask TMX to re-evaluate their responses in light of this information.</p> <p>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-noisekiller-whales See more at: http://www.beamreach.org/2014/04/30/emaze-talk-fossil-fuel-shipnoise-killer-whales#sthash.6DTS4jf7.dpuf</p> <p>If Km TMX is to follow the Precautionary Principle, then there should be little doubt that the underwater sound emanating from the sum total of ship traffic will be a major contributing factor leading to extinction of this species, if not the leading factor.</p> <p>Will KM TMX therefore provide the mitigation that must be adopted by tankers carrying its product to ensure survival of the Southern Killer whales and other Cetaceans in the Strait of Georgia,</p>
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<p>Shipping. Commercial shipping has increased dramatically in recent years. For example, between 1995 and 1999 the worldwide commercial shipping fleet 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.</p> <p>http://www.beamreach.org/2014/04/30/engage-talk-fossil-fuel-ship-noisekiller-whales See more at: http://www.beamreach.org/2014/04/30/engage-talk-fossil-fuel-shipnoise-killer-</p>		<p>and Juan de Fuca Strait?</p> <p>Also please provide the names of the scientific experts who are advising the PMV in the example you quoted.</p>
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[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 Limekiln 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

	<p>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 resident killer whales</p>		
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ⁱ Navigational improvements from Moffatt and Nichol 2013 Nov 26 TERMPOL 3.5 & 3.12- Route Analysis & Anchorage Elements. TERMPOL Navigational Improvements. These are repeated here as they are potential permit conditions. General Improvements to noted by consultants to KM TMX

1. Signals of the existing GPS/DGPS system may be affected by intentional/illegal interference, especially in urban areas. The status of the system is monitored by, amongst others, the pilots through their PPU's. In such circumstances, all vessels under guidance of a pilot would be able to either continue passage or bring the vessel to a safe anchorage. Small vessels that may be more reliant of GPS for position monitoring and navigation could be vulnerable.
2. Encourage the fitting and adoption of AIS by those smaller vessels that are currently not required to do so but possess the ability to carry AIS.
3. Encourage the fitting of radar reflectors on small vessels to make them more prominently discernible by radar, ship and shore.

Improvements as suggested by Pilots

4. Establish a navigational sector light on Berry Point.

5. Introduce an additional navigational aid to better mark the extent of Beaumont Shoal.

6. Consider the introduction of a Light and Aid to Navigation on Admiralty Point, Belcarra.

7. Provide a reliable, real time Tide & Current Gauge at the Second Narrows. The data should be transmittable to the Pilots PPU and/or other electronic devices.

8. Provide a reliable, real time Tide & Current Gauge at the First Narrows. The data should be transmittable to the Pilots PPU and/or other electronic devices.

9. Consider the introduction of Range Lights located strategically close to the shore in West Vancouver to provide a safe guide and transit to outbound vessels.

10. Introduce an Ocean Data Acquisition System (ODAS) or 'Smart' buoy for monitoring weather and environmental conditions in the southern Strait of Georgia similar to the one at Halibut Bank with the capability of transmitting the information to Pilots PPU's on a real time basis.

OTHER POTENTIAL NAVIGATIONAL IMPROVEMENTS

1. Extend the requirement for Tug Escort for laden tankers throughout the entire transit from Vancouver including the Strait of Juan de Fuca.

2. Introduce a moving safety/security zone around the tanker.

3. Extend pilotage of laden tankers to a location west of Race Rocks.

4. Extend tethered tug escort of laden tankers to a location west of Race Rocks, weather permitting.

5. Consider applying similar rules and restrictions associated with meeting traffic at Turn Point to East Point and Discovery Island as well.

6. The BCCP and Tug Masters should continue to train and improve pilotage and tug escort techniques and skills through the use of locally available. Full Mission Ship Simulators. Such ongoing training and practice should include advanced use of the PPU, docking/undocking manoeuvres, and familiarity with Second Narrows as well as emergency scenarios that may occur in restricted waters

7. Implement an effective method of monitoring and controlling small craft using the Narrows, 'TA' buoy west of Roberts Bank, East Point, and the mouth of the Capilano River when larger traffic is scheduled to transit. For example, this may be implemented through the use of the Harbour Master's or Police launch.

8. Additional scheduling at Boundary Pass, East Point and Race Rocks for all transiting vessels. Consider a priority system for loaded tankers.

9. PMV to consider adjusting the location of Inner Harbour anchorages and implement a two-way navigation channel in the vicinity of the Westridge Marine Terminal to improve navigational clearances between the terminal, anchored vessels, and passing vessels.

ⁱⁱ Oceans Act Preamble <http://laws-lois.justice.gc.ca/eng/acts/O-2.4/FullText.html> .

WHEREAS Canada holds that conservation, based on an ecosystem approach, is of fundamental importance to maintaining biological diversity and productivity in the marine environment;

WHEREAS Canada promotes the wide application of the precautionary approach to the conservation, management and exploitation of marine resources in order to protect these resources and preserve the marine environment.

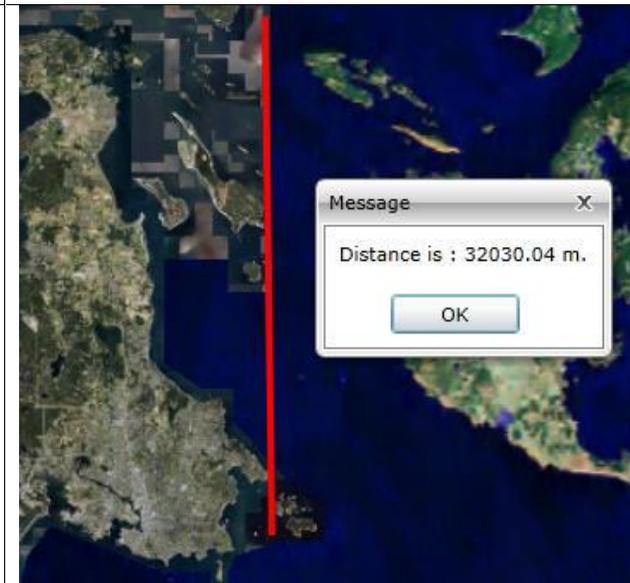
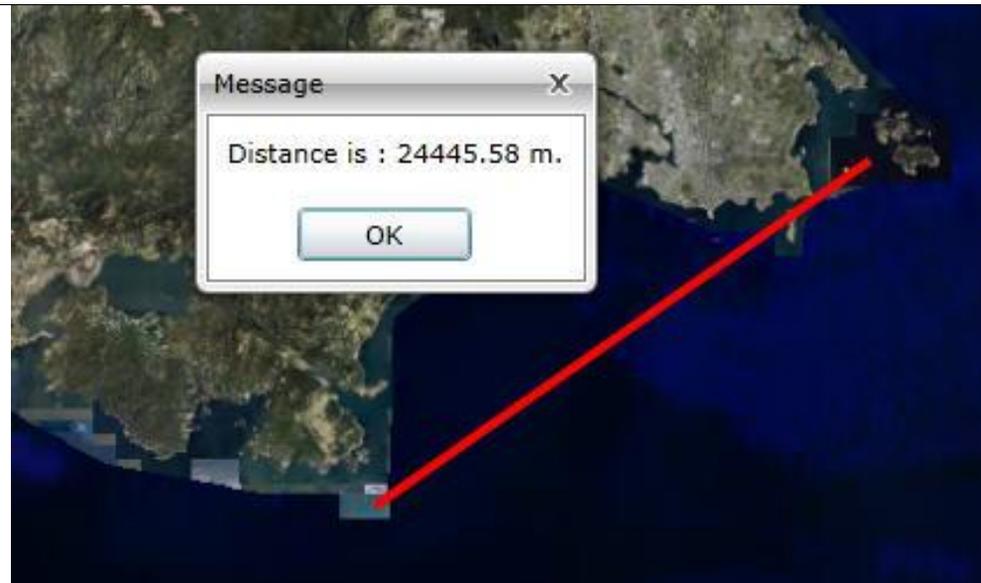
iii DNV consulting firm map of potential tanker accident locations. https://docs.neb-one.gc.ca/ll-eng/llisapi.dll/fetch/2000/90464/90552/548311/956726/2392873/2451003/2393783/B18-33_-_V8A_5.5.2_F5.5.2_TO_5.6.2.2_MAR_TRANS_ASSESS_-_A35Q3.pdf?nodeid=2393564&vernum=-2 Map included as concerns the no spill simulations were done near Oak Bay Island ER and the Victoria waterfront.



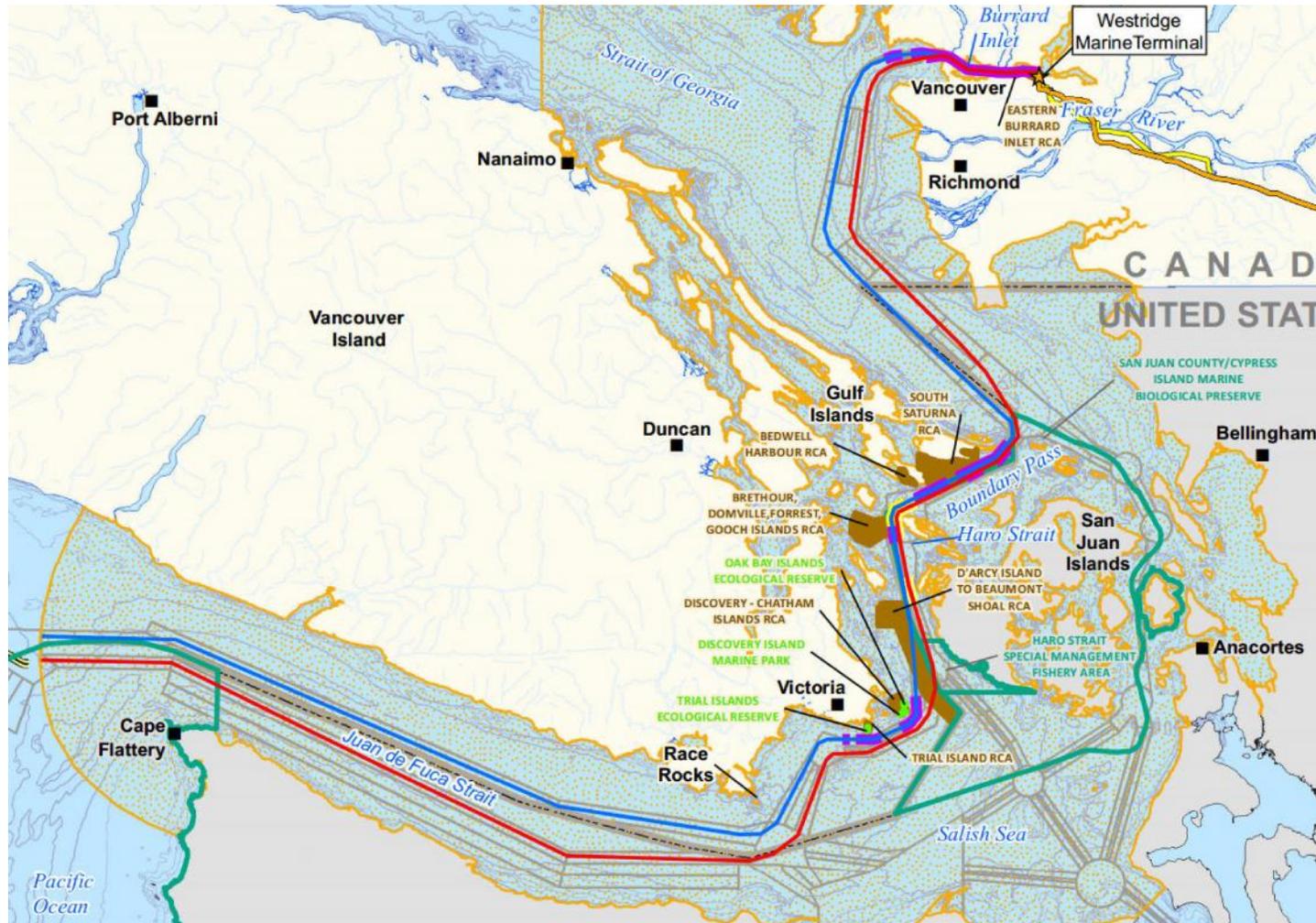
iv Distance from the spill modeling to Oak Bay ER and Victoria waterfront. Modeling of CWC scenario is needed to inform the conditions that may be appropriate for the KM project. The modeling of spills at Archane Reef and Race Rocks are informative but not adequate to understand environmental impacts near the densely population centre of Esquimalt, Victoria and Oak Bay Municipalities and the ecologically important Oak Bay Islands Ecological Reserves. Friends of Ecological Reserves does not accept that no more spill modelling is needed to inform the NEB decision.

A spill scenario for Race Rocks was modelled. Distance from Race Rocks to Oak Bay Islands Ecological Reserve is 25.5 km. Most of the oil appears to go to the Washington State shoreline. No spill was modelled near the Oak Bay Island ER and the Victoria water front. This is a concern for the distribution of oil was not modelled near the greatest population centre and the high value Oak Bay Islands ERs. There is the knowledge to model where it may go and this should be done as part of due diligence for the KM TMX project.

A spill scenario was modelled for a CWC scenario at Archane Reef. The distance from Archane reef to Oak Bay Island ER and the Victoria water front is 32 km. Archane reef is a potential accident site. However it is to distant to inform of a spill nearer Victoria



Map of ER and Rock Fish Conservation Areas within a 1km of the tanker corridor



^{vi} In the answers TMX provided for our IR2 questions, number 30, 31 and 32 on whales, there was no reference made to a new report from DFO January, 2015. We accept the possibility that this was perhaps not available at the time of the response to our IR2, but would now ask TMX to re-evaluate their responses to these three questions based on this report. It is very important that it is added to the record as it lays bare the wide range of deficiencies in the information that has so far been provided by TMX . Below are important excerpts from that report, bolding has been added for emphasis. The whole report is available at this hyperlink: [SUFFICIENCY REVIEW OF THE INFORMATION ON EFFECTS OF UNDERWATER NOISE AND THE POTENTIAL FOR SHIP STRIKES FROM MARINE SHIPPING ON MARINE MAMMALS IN THE FACILITIES APPLICATION FOR THE TRANS MOUNTAIN EXPANSION PROJECT](#)

page 4: “The increase in marine vessel traffic associated with the proposed Project has the potential to result in sensory disturbance to marine mammals from underwater noise, and an increased risk of injury and mortality associated with mammal-vessel strikes. This Science Response examines whether the Proponent has provided sufficient information and conducted appropriate analyses from which to draw conclusions on the effects of increased marine vessel traffic on selected marine mammal indicator species.

The information and analysis provided is insufficient for either a quantitative or a qualitative evaluation of the current rate of ship strikes, or how the rate may increase with the proposed increase in vessel traffic. Neither the analysis of shipping statistics for the Marine RSA, nor analysis of the data from the DFO’s Marine Mammal Incident Database, is used in a manner suitable for assessing the potential effect (exposure or consequence) of ship strike events on marine mammals in the Marine RSA. Specifically:

- Ship strikes are known to occur under normal shipping operations. However in many cases ship operators are unaware that a ship strike has taken place, and struck whales are often either not detected and/or sink. As a result, statistics based on recovery of dead whales under-represent the true frequency of ship strikes (Laist et al. 2001; Douglas et al. 2008). Therefore, ship strike data in DFO’s Marine Mammal Incident Database do not represent the true frequency of ship strike occurrences. This uncertainty has not been taken into account.
- No information is provided about speed or maneuverability of Project-related ships, distribution of whales in relation to the shipping lanes, or shipping intensity in the Marine RSA .

Marine Traffic and Underwater Noise Volume 8A, Marine Transportation, section 4.3 Effects Assessment – Marine Vessel Traffic operations subsection 4.3.7.4.2. The Project Application includes a qualitative assessment of “significance” of the potential effect of underwater noise on each of the marine mammal indicator species, as summarized in Tables 4.3.7.9 1(a) and 2(a). **The Proponent does not present a quantitative or qualitative framework by which to measure or classify the effect or consequences of the noise.** However, the Proponent refers to a study that identifies sound levels that were correlated with specific behavioural changes in Northern Resident Killer Whales (MacGillivray et al. 2012), but does not formally include these data to evaluate Project-related underwater noise and potential impacts on Southern Resident Killer Whales. From MacGillivray et al. 2012: “The study determined that at received sound levels of approximately 64 dB re: HT [Hearing Threshold], killer whales overtly avoided a whale-watching boat, while at received SPLs of approximately 57 dB re: HT, they exhibited subtle avoidance responses.” **While this study is identified, the Proponent does not formally incorporate the data from the study or acknowledge that there may be a link between the observed behavioural responses of Northern Resident Killer Whales at these sound levels, and the probability of behavioural responses of Southern Resident Killer Whales at the noise levels that are anticipated as a result of increased Project-related vessel traffic.** DFO recognizes that quantifying the effects of individual behavioural response at the population level is difficult. However; there have been important advances in this area that highlight the evidence of physiological responses to increased noise at below threshold levels (Rolland et al. 2012). As well

there are recent efforts to develop frameworks to relate noise disturbance to individuals to population level effects (Clark et al. 2009; NRC 2005). **Noise impacts on reproductive success and survival are pathways to a population level effect, but these have not been formally considered by the Proponent.** Volume 8A, Marine Transportation, section 4.3 Effects Assessment – Marine Vessel Traffic operations, Table 4.3.7.9. **The Proponents provide a definition of significance that does not incorporate information or data to allow for a quantitative assessment to determine under what conditions “significant” noise events occur.** The Project Application states that significance means: “A high probability of occurrence or a permanent or long-term residual effect of high magnitude that cannot be technically or economically mitigated”. The effects assessment incorporates information from SARA Recovery Strategies and Management Plans and COSEWIC reports for the indicator species (Southern Resident Killer Whales, Humpback Whales, Steller Sea Lions). The effect assessment considers the following information: • whether or not underwater noise is listed as a threat or concern for the species • the length of time an individual might be exposed to noise from a single Project-related ship in the RSA • whether all or only a portion of the species population occurs in the RSA • the proportion of the year that the population resides in the RSA • whether or not Critical Habitat for the species overlaps the RSA • whether or not the acoustic environment is identified as a feature of Critical Habitat for the species 8Pacific Region Trans Mountain Expansion Project **While the use of this information may be appropriate, it is not presented in a qualitative framework that illustrates how these factors were ranked. As presented in Table 4.3.7.9, it is not possible to evaluate the Proponent’s conclusion that the residual effects would be significant for Southern Resident Killer Whales, but not significant for either Humpback Whales or Steller Sea Lions.** Volume 8A, Marine Transportation, section 4.3 Effects Assessment – Marine Vessel Traffic operations, subsection, 4.3.7.4.5, Assessment of Potential for Residual Effects of Auditory Injury Potential harm from Project-related marine vessels has been assessed quantitatively by comparing the modelled sound level contours against published acoustic thresholds associated with temporary and permanent hearing threshold shifts (TTS and PTS). **The assessment of effects from noise levels at or below the threshold for behavioural disturbance is not sufficient. The assessment considers noise from a single Project-related ship, without taking into account the additive and cumulative effects of existing noise, or increased noise due to Project-related increases in vessel traffic.** These omissions inhibit the assessment for potential residual effects from Project -related ship noise on indicator marine mammal species. The limitations in the application of the model will be addressed in the next section. Model Adequacy and Applicability: Are the methods used to assess the potential effects of underwater noise and marine vessel strikes on the marine mammal indicator species appropriate and executed properly? Ship Strikes **While the potential for marine mammal-vessel ship strikes is discussed in the Project Application, the potential risks associated with ship strikes and marine mammals have not been quantified or formally assessed using any existing methodologies (e.g., Vanderlaan et al. 2008; Williams and O’Hara 2010).**

Underwater Noise:

JASCO’s Marine Operations Noise Model (MONM), used to determine noise sound fields radiating from transiting tankers and escorts, is a state of the art model that incorporates important parameters related to acoustic propagation characteristics in the Marine RSA. Sound levels at various distances from a modelled ship are considered relative to existing acoustic thresholds reported as sound pressure or exposure levels in decibels (dB) associated with auditory injury (Temporary Hearing Threshold Shifts TTS, and Permanent Hearing Threshold Shifts PTS) as well as an acoustic threshold believed to be associated with behavioural disturbance (Southall et al. 2007; NOAA 2013). The resulting outputs are measures of the distance, in kilometres, from the ship at which noise above these thresholds would occur. **This review, however, finds that the model has not been applied in a manner that fully assesses ship noise in the**

Marine RSA. Volume 8A, Marine Transportation, section 4.3 Effects Assessment – Marine Vessel Traffic operations, subsection 4.3.7.4.4 Summary of Acoustic Modelling Results presents four different scenarios with Aframax tankers at different speeds and with different tug escorts. The resulting radii of underwater sound pressure level contours are presented in Table 4.3.7.3. **Areas that are known to be within critical habitat for the indicator marine mammals species, for example, the Boundary Pass region, a known area of frequent transit by Southern Resident Killer Whales, have not been included in the four modelling locations.** The oceanographic conditions in the Boundary Pass region may vary significantly from the conditions in Haro Strait (Hauser et al. 2007). **To adequately assess the exposure of marine mammals to underwater noise, the model should have been run along the whole ship-track, with a realistic combination of tanker 9Pacific Region Trans Mountain Expansion Project speed and tug escort. With this configuration, a map could have been generated to show the radii of underwater sound pressure level contours along the complete ship track through the Marine RSA, from which the spatial and temporal overlap with known distributions of indicator species could be determined.** Data used in the MONM may not be adequate to characterize the acoustic propagation properties of the Marine RSA. In the description of MONM, it is stated that the sound speed profiles used in the modeling come from the U.S. Naval Oceanographic Office’s Generalized Digital Environmental Model (GDEM), with monthly profiles in latitude/longitude grid with 0.25o resolution, which translates to approximately 15 nm between grid points. **It is not clear how well these data represent the sound speed profiles in tidally controlled areas like Haro Strait and Boundary Pass. More appropriate data from these areas are available in DFO’s archives. The modeling should also be conducted for typical winter and summer conditions to allow for evaluation of seasonal differences in sound propagation characteristics, and to determine whether certain locations need further attention, especially if they are known to be visited frequently by marine mammals.** Volume 8A, Marine Transportation, section 4.3 Effects Assessment – Marine Vessel Traffic operations, subsection, 4.3.7.4.5, Assessment of Potential for Residual Effects of Auditory Injury The assessment of potential harm from the additional shipping activity is primarily focused on the more serious, but less likely, temporary and permanent threshold shifts (TTS and PTS) that could occur in marine mammals exposed to transiting ships. Based on results from the MONM the Proponent concludes that noise-induced temporary threshold shifts and permanent threshold shifts from the increased Project-related shipping are unlikely because noise at such levels would only occur quite close to the ships. **However effects from chronic exposure to noise levels that are below the TTS threshold level is a significant concern in the Marine RSA, particularly for SARA listed cetaceans** (Erbe et al. 2012; Williams et al. 2013; DFO, 2011). **The underwater noise environment in the Marine RSA is not adequately modelled in the Project Application; only Project-related ship noise is modeled, and not the additive and cumulative effects of existing ship source noise. The model is currently used only to assess the impact of a single Project-related ship passing a single stationary marine mammal. As the number of ships transiting the area from all sources increases, the frequency and duration of relative quiet will decrease correspondingly.** Model outputs that include additive and cumulative effects of Project related and existing ship noise would be a more accurate measure of the noise environment to which the marine mammals would be exposed.

Conclusions:

There are deficiencies in both the assessment of potential effects resulting from ships strikes and exposure to underwater noise in the Trans Mountain Expansion Project Application documents. There is insufficient information and analysis provided with which to assess ship strike risk in the Marine RSA from either existing or Project-related traffic. Ship strike is a threat of conservation concern, particularly for baleen whales such as Fin Whales, Humpback Whales and other baleen whales (Gregr et al. 2006). If shipping intensity increases as projected in Section 4.4 in the Marine RSA and the Strait of Georgia

and Juan de Fuca Strait as a whole, the significance of this threat to cetacean populations that occupy the region will increase. Incidence of recovered whale carcasses is not considered to be an adequate measure of the frequency of ship strikes. No information is provided about the speed and maneuverability of Project-related ships or the distribution of whales in relation to the shipping lanes. Analyses that 10Pacific Region Trans Mountain Expansion Project consider the statistical probability of ship-whale encounters and the risk of collisions are considered appropriate methodologies to assess this potential effect. The JASCO MONM model, as it has been applied by the Proponent, is not adequate to assess the overall impact of noise from increased Project-related traffic. Although state-of-the-art acoustic modelling has been used to model the noise propagation associated with a single Project-related tanker in the Marine RSA, only four locations were chosen to represent the Marine RSA; therefore, the assessment does not adequately represent the noise exposure for the entire time a marine mammal would be in the RSA. The assessment represents only Project-related tanker traffic and not the current noise environment or the potential increase due to Project-related traffic. Finally, the method used to assess the significance of impacts from the modelled noise level contours resulting from a single Project-related tanker and tug on indicator cetacean and pinniped species is qualitative and the lack of an appropriate assessment framework reduces DFO's ability to evaluate the assessment.