Environment Canada | Environnement Canada

Environmental Protection Operations
Environmental Stewardship Branch
351 Saint-Joseph Boulevard
Gatineau, QC K1A 0H3

July 4, 2014

ECPT: 12-09036

Sheri Young
Secretary of the Board
National Energy Board
444 Seventh Avenue SW
Calgary, AB T2P 0X8

Dear Ms. Young:

Re: Hearing Order OH-001-2014
Trans Mountain Pipeline ULC (Trans Mountain)
Application for the Trans Mountain Expansion Project
Procedural Direction No. 3 – Process for hearing motions to compel full and adequate responses to information requests

Please find attached a notice of motion by Environment Canada pursuant to Procedural Direction No. 3. Environment Canada recognizes this motion as an important means of advising the Proponent and the Panel of deficiencies in responses to Round 1 information requests as early as possible in the review process.

The motion details information that will be key to understanding potential impacts and to enhancing confidence in environmental assessment conclusions. Available data and guidance that would assist the Proponent in addressing the deficiencies has been identified.

Environment Canada looks forward to the Board's consideration of this motion.

Sincerely,

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Grant Hogg
A/Director General

attach.

Canada

Hearing Order OH-001-2014
Trans Mountain Pipeline ULC (Trans Mountain)
Application for the Trans Mountain Expansion Project
Procedural Direction No. 3 – Process for hearing motions to compel full and adequate responses to information requests (IRs)

Environment Canada comments on inadequacy of IR responses (Round 1 Intervenor IRs to Trans Mountain)

IR #	IR Wording	Trans Mountain's response to IR	Intervenor's explanation for claiming IR response to be inadequate
1.057	EC requests that the Proponent recalculate the marine emissions in the RSA, and the LSA for Westridge using the most accurate and current available data, and that the impacts on air quality be revised as necessary.	As discussed in EC P IR No. 1.13 (provided as GoC EC IR No. 1.001 – Attachment 1), it was recognized that the 2005 Corbett inventory under-represents current emissions in the Marine Air Quality Regional Study Area and that the Environment Canada's Marine Emission Inventory Tool (MEIT) is more complete and recent. However, after receiving the MEIT in September 2013 when dispersion modelling was in progress, Trans Mountain was unable to access the tool to extract information for modelling. The offer of technical assistance is moot as it was learned that the tool was not designed to work on an independent server and Environment Canada was not able to provide the MEIT calculated emission data for Trans Mountain (i.e., perceived conflict of interest as Environment Canada would participate in the NEB review process). Therefore, Trans Mountain was and still is not able to fulfill this request.	The Corbett marine emissions inventory (Wang et al, 2008) used by the Proponent underestimates marine emissions by a factor of 10 and so EC is unable to validate the marine emissions inventory, the impact of the Project on marine emissions (i.e. the % change as a result of the project), and cannot validate the inputs to the dispersion and photochemical modelling. Moreover, EC knows of no impediment to using MEIT on external databases, and EC did provide technical assistance to RWDI for using the tool, so the response to 1.057 is incorrect. If necessary, EC will provide emissions outputs from the MEIT for RWDI to use in their modelling.
1.058	EC requests that the Proponent re-evaluate the Base Case with berth and anchorage emissions included.	To clarify, all berth and anchorage emissions associated with Trans Mountain operations were evaluated, both for the Base Case and the Project Case. Berth and anchorage emissions associated with other non-Trans Mountain marine traffic could not be considered due to the lack of information… As shown in Table 4.9 and Table 5.3 of Technical Report	MEIT was licensed to the Proponent through RWDI and contains berth and anchorage emissions for all marine vessels in the region. Failing that, the Proponent referenced the BC Chamber of Shipping Marine Emissions inventory for anchorage times (see response to IR 1.061) and this inventory contains berth and anchor emissions. So it is not

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		8B-3 in Volume 8B, Marine Air Quality and Greenhouse Gas Marine Technical Report 8B-3 (RWDI December 2013), and in Table 5.21 of Technical Report 5C-4 in Volume 5C, Air Quality and Greenhouse Gas Technical Report (RWDI December 2013), respectively, the maximum predicted concentrations associated with the Project is low compared to maximum predicted concentrations associated with the Base Case. Moreover, Project effects are expected to remain well below all applicable ambient air quality objectives. Consequently, it is believed that the use of the 2005 Corbett inventory adequately describes existing air quality conditions with the intent of determining the significance of Project effects as per the NEB Filing Manual (2014) and there is no need to re-evaluate the Base Case.	understood that these emissions could not be considered due to lack of information. The Proponent argues that this re-evaluation isn't necessary but reporting maximum modelled concentrations as "project only" (see also IR response 1.057 and 1.060) prevents EC from validating the proponent's conclusions. What is needed are modelled concentrations using 1) a Base Case, revised using MEIT, and 2) Base Case revised using MEIT PLUS Project Emissions. This is in keeping with the Province's "Guidelines for Air Quality Dispersion Modelling in British Columbia", which states that in order to understand the implication of a source on actual air quality, an existing background or baseline has to be established. Using the "project-only" concentrations, or incremental concentrations, as a reason to not revise the baseline is not useful. Moreover, the response is inconsistent with EC's understanding of the NEB Filing Manual. See Filing Manual Section A.2 "Environmental and Socio-Economic Assessment" and Figure A2-1, which indicates that Predicted Effects are to include the environmental setting, which includes a "baseline". Finally, the Proponent offers contradictory conclusions. In response to IR 1.058 the 2005 Corbett inventory "adequately describes existing air quality conditions…". But in the response to IR 1.060, the Proponent concludes that "incremental emissions due to the Project as a percent of total emissions in the Marine Air Quality RSA are expected to be considerably less as the existing emissions are likely under-estimated, being based on the 2005 Corbett emission inventory."

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			Until the Proponent agrees to use MEIT and thus include all anchorage and berthing emissions for its Base Case, it is not possible for EC to validate the inputs into the air dispersion modelling.
1.060	EC requests that the Proponent: a) add a table to Section 7 in Vol 5A that shows annual emission inventories for Existing Conditions compared to With Project Conditions, for the LSA Westridge; b) add a table to Section 4.3 in Vol 8A, for the RSA marine; and c) explain the negative impact balance in that context.	See tables 1.60A-1, 1.60B-1 … Emissions of nitrogen oxides (NOx) and sulphur dioxide (SO2) are expected to roughly double as a result of the additional marine vessels being loaded and unloaded at the Westridge Marine Terminal. Emissions of volatile organic compounds (VOCs) are expected to increase by less than 10% at the Edmonton and Burnaby Terminals due to the addition of proposed new storage tanks. Emissions of VOCs are expected to decrease slightly at the Kamloops Terminal as a result of lower product throughput with the Project. Emissions of VOCs at the Sumas Terminal are expected to decrease by 37% despite an increase in annual product throughput due to the addition of fixed dome roofs on three of the existing external floating roof tanks. At the Westridge Marine Terminal, annual emissions of VOCs may increase substantially (over 2000%) as a result of incremental fugitive emissions associated with marine vessel loading activities. This increase only represents the change in emissions associated with Trans Mountain operations due to the Project. Combined VOC emissions at the Burnaby and Westridge Marine Terminals are expected to increase by only 16% of total VOC emissions in the Local Study Area (LSA) and by 4% of total VOC emissions in the Regional Study Area (RSA). Incremental marine vessel traffic due to the Project is expected to increase emissions in the Marine Air Quality RSA by over 500% for CACs and over 1000% for VOCs.	EC is unable to validate this response because the Proponent is using the Corbett inventory as a baseline, and does not provide numbers that demonstrate the conclusion that "incremental emissions due to the Project as a percent of total emissions in the Marine Air Quality RSA are expected to be considerably less as the existing emissions are likely under-estimated, being based on the 2005 Corbett emission inventory".

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		Again, this increase only represents the change in emissions associated with Trans Mountain operations due to the Project. The incremental emissions due to the Project as a percent of total emissions in the Marine Air Quality RSA are expected to be considerably less as the existing emissions are likely under-estimated, being based on the 2005 Corbett emission inventory."	
1.061	Auxiliary engines produce emissions while vessels are at anchorage. Anchorages at Port Metro Vancouver are already limited and tankers and other vessels must often wait for a berth. Recent observations of marine traffic have indicated anchorage times for tankers can be in the order of weeks not days. Based on the Proponent's response to EC's Pre-Hearing Order IR 9, it is understood that berthing at Westridge is expected to decrease by about 20% as a result of the Project. However, in pre-Hearing Order IR 9 EC was requesting an estimation of how anchorage times are expected to change as a result of the Project. EC requests that the Proponent: a) Revise Table 3.7 to show time in mode for the Base Case and the Application Case; b) Provide a reference that the 20 hr anchorage time quoted is still current today; and c) Indicate whether it has considered increased wait-times for vessels bound for Westridge, and considered increased wait times for all vessels as part of the cumulative effects assessment.	a) The vessels that are normally waiting for extended periods are non-tankers. That said, tankers loading at the Westridge Marine Terminal currently arrive early and await cargo readiness. With an expanded pipeline system and three Aframax capable berths available for the Project, Trans Mountain expects to maintain a prompt and efficient turnaround of tankers with minimal delays when arriving and departing under normal circumstances. Therefore, a revision to Table 3.7 is not warranted. b) The 20 hour anchorage time is taken from the 2005-2006 BC Ocean-Going Vessel Emissions Inventory (Chamber of Shipping 2007). This represents the most current and relevant information found. Reference: The Chamber of Shipping. 2007. 2005-2006 BC Ocean-Going Vessel Emissions Inventory. Vancouver, BC. 126 pp. c) Please refer to the response to GOC EC IR No. 1.061b for increased wait times for Project-related marine traffic. With respect to an updated cumulative effects assessment, Trans Mountain has no information with respect to wait times for all non-Trans Mountain vessels using the Port of Metro Vancouver.	EC asked for a revision to Table 3.7 that showed more current anchorage times and how they would change due to the project for all vessels. Failing that, we asked for proof that the 20 hrs quoted for anchorage times was still current today, not where the figure came from. Anchorage and berth contribute to up to 60% of the marine emissions in this region and adding 380 vessels per year, on top of other increases in traffic, could lead to increased anchorages and increased emissions. Moreover, it is EC's understanding that tankers anchor for more like 100 hours, not 20, during which time the tankers are emitting CACs including VOCs. EC does not agree with the Proponent's statement that there is no information on wait times for non-project related vessels, given the AIS data that is readily and publicly available. Thus the response to 1.061 is inadequate and doesn't allow EC to validate the emissions during anchorage, nor the cumulative effect a >10% increase in total vessel traffic on the anchorage times of vessels calling at Port Metro Vancouver.
1.068	d) provide the modeled NOx and selected VOC species concentrations (with and without the Project) at Metro Vancouver monitoring stations around Burrard Inlet (T09,	d) The air quality assessment completed for the Trans Mountain Expansion Project (Project) by Trans Mountain's consultants, RWDI AIR Inc., is sufficient to address	Three EC scientists met with RWDI November 21, 2012. EC acknowledges that RWDI provided two draft work plans covering the dispersion modelling aspects of the assessment.

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	T26, T01,T32, T18).	emissions of air contaminants and greenhouse gases from the Project. The modeling results provided in the technical report are based on a number of conservative assumptions. Accordingly, the information requested is not required or necessary. RWDI AIR Inc. met with senior scientists from Environment Canada on November 21, 2012 to review two draft work plans (marine and terrestrial) that were developed by RWDI in response to NEB Filing Manual (NEB 2014) requirements for assessments of air emissions and greenhouse gas emissions. Suggestions were provided by Environment Canada to improve upon the plans and these were incorporated into the final version of the work plan. Environment Canada and other regulatory agencies, such as Metro Vancouver, that RWDI met with also made recommendations for additional effort with new studies to strengthen the final submissions to the NEB and reduce the number of Information Requests (IRs). These included regional air shed modeling using the Community Multi-Scale Air Quality (CMAQ) model to estimate the formation of photochemical pollutants such as ozone, particulate matter (PM2.5) and visibility. Trans Mountain agreed to the additional studies requested by Environment Canada and others, and the results were incorporated into the Application which was filed with the NEB in December 2013. It should be noted that RWDI prepared a detailed model plan which outlined the proposed meteorological and air quality information that RWDI was proposing to rely upon to complete the air quality assessments (terrestrial and marine) (see Appendix B of Technical Report 5C-4 in Volume 5C, Air Quality and Greenhouse Gas Technical Report [RWDI	However, these plans did not include any approach (such as photochemical modelling) to address the formation of ozone or PM2.5 as a result of project emissions interacting with other pollutants in the airshed. During the meeting EC suggested that the assessment should address project impacts on ozone concentrations. EC scientists have no record of discussions addressing the technical details of project photochemical modelling. EC has reviewed the detailed model plan referenced by RWDI (Appendix B, Technical Report 5C-4). This plan addresses the meteorology and dispersion modelling approach proposed for the assessment. The plan does not cover the methodology to be used for the project for photochemical modelling. RWDI provided an Updated Detailed Model Plan for the BC Portion of Study Area of the Trans Mountain Expansion Project to the BC Ministry of the Environment, Metro Vancouver and Fraser Valley Regional District on May 17, 2013. The Updated Plan also included a table of comments on a previous version of the plan from the parties and responses from RWDI. With respect to Metro Vancouver ID#10 concerning downwind photochemistry, RWDI responded: "Photochemical modeling will be conducted separately using the CMAQ model which is not discussed in the plan". Environment Canada is unaware of any plan that outlined the photochemical modelling for the Trans Mountain Expansion project. Please also refer to explanation with respect to GOC EC IR no. 1.080.

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		December 2013]). It was agreed in the meeting with Environment Canada on November 21, 2012 that, as Metro Vancouver and the British Columbia Ministry of the Environment (BC MOE) would be approving and signing the detailed model plan, Environment Canada did not want to be involved in that task. With respect to this IR, it is outside the scope of work that was agreed to in the revised work plan or detailed model plan approved by Metro Vancouver and BC MOE. As such, no additional analysis of the information provided or modeling will be completed in response to this requests.	
1.076	EC requests that the Proponent: a) supply a model evaluation of the CMAQ photochemical modeling system for a minimum of 5 stations in a transect across the LFV (e.g. T31, T18, T27, T33 and T12) and a minimum of 5 stations around the Burrard Inlet (e.g. T01, T26, T04, T09, and T32). As in Steyn et al. (2013), the evaluation would consider the model's ability to reproduce observed CO, NOx, PM2.5 and ozone quantified using standard statistical measures (e.g., root mean square error, mean bias, correlation coefficients); b) evaluate the modeled VOC concentrations because of the importance of VOC emissions both with respect to the Project and with respect to the airshed's VOC-sensitivity. There are NAPS speciated VOC canister samples available during the modeled 2006 episode: June 29th at S100111 (T09), June 28th at S100133 (T22), S100134 (T31) and S100137(T24); and c) supply a model evaluation of the WRF meteorological output at both the Vancouver International (YVR) and Abbotsford Airports. Such an evaluation would consider the	a) Please refer to the response to GoC EC IR No. 1.068d. b) Please refer to the response to GoC EC IR No. 1.068d. c) Please refer to the response to GoC EC IR No. 1.068d.	Please refer to explanation with respect to GOC EC IR no. 1.080

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	model's ability to reproduce temperature and relative humidity. Hodographs at YVR (as shown in Steyn et al. 2013) should be supplied to show how well WRF captures the onshore flow seen throughout the episode		
1.080	EC requests that the Proponent estimate what the influence of using the newer 2010 inventory with the most updated marine emissions on concentrations of O3 and PM2.5. EC can supply the 2010 inventory by request.	Please refer to the response to GoC EC IR No. 1.068d.	Environment Canada has three primary concerns with the photochemical modeling conducted to determine the impact of the proposed project emissions on ozone and $PM_{2.5}$ concentrations in the vicinity of the project: 1. There is a large discrepancy (order of magnitude) in annual NOx emissions between the relatively old emissions inventory used by the Proponent and the more advanced Marine Emissions Inventory Tool (MEIT) approach. This discrepancy substantially reduces confidence in the results of modelling based on the older emissions inventory. 2. It is unclear whether the Proponent has suitably characterized the potential ozone impacts by simulating only a single episode. The paper referenced (Steyn et al. 2012) specifically looks at 4 different episodes with different wind flows in order to capture local meteorological variability during summer days conducive to ozone formation. In order to rely on this single episode, a thorough analysis of the model output would be needed, leading to the next issue. 3. The model evaluation (meteorology, emissions and chemistry) was too limited to judge the veracity of the conclusions drawn from the modelling output. Given the nature of the Project, the size of the proposed

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			emissions, and the surprisingly small predicted impacts, a thorough analysis of the model output is needed. All of the above issues would suggest that re-modelling is needed which would necessitate the use of the most accurate emissions, a proper analysis of the output, and potentially additional simulations. Substantial additional effort would be needed to achieve this, and the additional effort would not likely deliver sufficiently improved results without improved emission inputs. MEIT-based marine emissions have been made available to the Proponent (see GoC EC IR No. 1.057) for the dispersion modelling. Unfortunately, the spatially allocated and chemically speciated photochemical version of this marine emissions inventory will not be externally available for a few months. Based on challenges outlined above, but in particular the outdated marine emissions inventory, Environment Canada concludes that the results of the photochemical modelling conducted for the project are too uncertain to draw meaningful conclusions about the impact of the additional emissions from the proposed Project on ozone and PM2.5 concentrations for affected receptors in the vicinity of the Westridge and Burnaby terminals.