

Milton Logistics Hub Project | REVIEW PANEL

Joint process established under the Canadian Environmental Assessment Act, 2012, and the Canada Transportation Act

September 25, 2018

Normand Pellerin
Assistant Vice President, Environment and Sustainability
Canadian National Railway Company
By email

Subject: Information Request Package 8 - Milton Logistics Hub Project Review Panel

Dear Mr. Pellerin,

The Review Panel established for the joint process for the review of the Milton Logistics Hub Project has completed its review of the responses to its Information Request Packages 1 through 5 (CEAR #561, #574, #592, #613, #632, #646, #647, #652, #654, #655, #656) provided by the Canadian National Railway Company (CN), as well as CN's response to issues raised by Health Canada (CEAR #643). The Panel has identified additional information required before proceeding to the public hearing stage in accordance with its Terms of Reference, and has attached to this letter Information Request Package 8, which requests additional information from CN.

In preparing these information requests the Review Panel reviewed and considered comments from participants received prior to July 30, 2018 that were related to CN's Information Request responses.

Please inform the Review Panel of the anticipated response date as soon as possible. CN's response to these information requests will be made available to participants on the public registry.

If you have any questions or concerns, please contact Joseph Ronzio, Panel Manager at (613) 699-6778 or MiltonHubPanel@ceaa.gc.ca.

Sincerely,
<Original signed by>

Lesley Griffiths, Review Panel Chair

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Milton Logistics Hub Project Review Panel Information Requests Package 8

September 25, 2018

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Referenced Documents

8.1 Boyne Survey Secondary Plan and relevant sub-plans

Rationale:

Throughout the materials on the Review Panel's record CN (CEAR #[57](#), [375](#), [647](#), [656](#)) and several participants (CEAR #[26](#), [37](#), [544](#), [549](#), [667](#)), in particular Conservation Halton (CEAR #[674](#)), have made multiple references to information in the Boyne Survey Secondary Plan. In particular, participants have referred to updated watercourse rankings, planned or ongoing upstream enhancements to Tributary A upstream of the project development area, stormwater management strategies, conceptual fisheries compensation plans and monitoring strategies and restoration frameworks and a number of sub-plans that have been prepared to manage these issues. The Review Panel needs more information from the Boyne Survey Secondary Plan and its sub-plans in order to understand the submissions made by CN and other participants.

Information Request:

- a) Describe to what degree, if any, the Project could affect the ability of the Town of Milton and Conservation Halton to achieve planned enhancements to the Tributary A and Indian Creek systems, as described in the Boyne Survey Secondary Plan and its relevant sub-plans.
- b) Provide the Review Panel with relevant information from the Boyne Survey Secondary Plan, including updated watercourse rankings, planned or ongoing upstream enhancements to Tributary A upstream of the project development area, stormwater management strategies, conceptual fisheries compensation plans and monitoring strategies and restoration frameworks. As appropriate, provide information contained in sub-plans such as the Functional Stormwater and Environmental Management Strategy, Conceptual Fisheries Compensation Plan, and Restoration Framework, including details on specialized habitat features.

Air Quality

8.2 Project site ambient air quality monitoring results

Rationale:

In its response to the Review Panel's information request #3.1 (CEAR #[613](#)), CN provided the results of its ambient air quality monitoring study to establish whether differences between this monitoring data and the data used for the air quality assessment in the EIS might affect the effects CN predicted in its air quality and human health risk assessments. Based on the monitoring data, when combined with the predicted values from the Project, CN predicted that the Project could result in exceedances of ambient air quality criteria for some contaminants, including PM_{2.5} and PM₁₀. CN provided additional analysis on these exceedances in Attachment IR3.1-2: HHRA Update and some of the updated exposure ratios exceeded 1.0. Despite these exceedances, CN concluded that it did not expect unacceptable health risks

to the public from exposure to these air quality contaminants of potential concern associated with the Project because exceedances would be limited in frequency and magnitude and because CN had used conservative modelling assumptions. CN did not discuss potential health effects that might result from substances that would not exceed exposure ratios of 1.0.

In its comments on CN's response to the Review Panel's Package 3 information requests, Health Canada (CEAR #666) indicated that PM_{2.5} is a human carcinogen and therefore unacceptable human health risks may arise in the current PM_{2.5} exposure scenarios. Health Canada stated that health effects, including cardiovascular and respiratory effects, can occur at levels below the Canadian Ambient Air Quality Standards (CAAQS). Health Canada recommended that CN establish mitigation measures to reduce emissions, given that there are no recognized thresholds for the health effects of PM₁₀ and PM_{2.5}.

Health Canada also noted that new CAAQS for NO₂ were announced in December 2017 and will be effective in 2020. These new standards use a different statistical form of the numerical standard than the one presented by CN and for that reason the values in the EIS cannot be compared against the new standards.

Additionally, in the cumulative effects assessment summary table (Table IR3.16-3), results for the cumulative effect assessment scenario for NO₂ and CO are different from the results presented in Tables 1 and 2 of Attachment IR4.29. For instance, the results for 1hr NO₂ in 2021 in Tables 1 and 2 are respectively 110 µg/m³ and 114 µg/m³. CN did not provide a clear rationale to explain these differences.

Information Request:

- a) Discuss the potential health effects associated with non-threshold substances such as PM₁₀ and PM_{2.5}.
- b) Provide an updated assessment, including cumulative effects, using the 2020 Canadian Ambient Air Quality Standards for 1-hour NO₂ and annual NO₂. Identify whether there would be exceedances and discuss the implications of the new standards.
- c) Clarify the discrepancies between Table 1 and 2 of Attachment IR4.29 and Tables IR3.16-2 and IR3.16-3 for the cumulative effect scenarios.

Human Health

8.3 Other contributions to baseline exposure ratios and exposure pathways to human health effects

Rationale:

In its response to the Review Panel's information request #4.24 (CEAR #632), CN stated that although particulate matter (PM₁₀ and PM_{2.5}) and diesel particulate matter can settle on the ground, the known toxicity of particulate matter and diesel particulate matter is related to inhalation, not to ingestion or dermal contact. CN stated in response to information request #4.27 that omitting the deposition of particulate matter and diesel particulate matter on agricultural and garden produce as a pathway in the

human health risk assessment is consistent with Health Canada's Human Health Risk Assessment for Diesel Exhaust (Health Canada 2016).

In its comments on CN's responses to the Review Panel's information request #4.24 (CEAR #672), Halton Municipalities stated that CN did not consider background exposure arising from sources other than air in its exposure ratios. In its view, CN should also have considered potential uptake by vegetation, deposition to the soil surface, and other methods of exposure.

In its comments on CN's response to the Review Panel's Package 3-5 information requests, Health Canada (CEAR #666) agreed with CN that the predominant pathway of exposure to diesel exhaust is via inhalation, but also noted that it is prudent to consider dermal contact and ingestion of diesel exhaust as potentially operable exposure pathways. Health Canada stated that while its Human Health Risk Assessment for Diesel Exhaust (Health Canada 2016) focused on the inhalation pathway, the potential exists for deposition of diesel particulate matter onto soil, garden produce and recreational waters. Health Canada also stated that diesel particulate matter has the potential to adsorb other chemicals that may settle onto soil, garden produce and recreational waters. Health Canada stated that the potential for these pathways to be operable via air deposition should be included in the human health risk assessment.

Information Request:

- a) If the Project may result in contaminants settling onto soils, garden produce or recreational waters, assess the Project's risk to human health based on other applicable exposure pathways and chemicals of potential concern, including the deposition of particulate matter and diesel particulate matter, and subsequent oral or dermal contact.

Truck Traffic

8.4 Transportation Impact Studies

Rationale:

In order to address the effects of truck traffic generated by the development of the proposed terminal, CN provided in Appendix E.17 of the EIS a study of terminal-generated truck traffic conducted by the BA Consulting Group. As part of its response to information request #2.33, CN also filed four additional studies: Terminal Road Access Study, Safety Assessment of Site Accesses at the Proposed CN Logistics Hub and Safety Assessment of the Proposed CN Logistics Hub and Draft CN Milton Logistics Hub Transportation Considerations, (CEAR #592). CN noted that these studies were meant to assess the safety of proposed access points to the Milton Logistics Hub and to examine terminal-generated truck traffic beyond the Project.

In its comments on CN's responses to the Review Panel's information request #2.33 (CEAR #667), Halton Municipalities asserted that the results provided by these reports were insufficient because the analysis and assumptions were inconsistent with typical engineering approaches and therefore produced results that minimized environmental effects. Halton Municipalities claimed that several assumptions, projections, factors, safety performance functions, risk assessment, and approaches differed from industry standards.

As part of its submission, Halton Municipalities filed two reviews prepared on its behalf by CIMA+: *CN Milton Logistics Hub Terminal Road Access Study Report and Transportation Considerations Report Peer Review, July 16, 2018* and *Milton Logistics Hub Route Study Peer Review of Safety Assessments, July 16, 2018*. Based on these, Halton Municipalities suggested that CN's work produced results that minimize environmental effects. It cited the following examples:

- CN did not double heavy truck volumes for the analysis of the entire roadway system beyond the facility entrance. A doubling of truck volumes would be consistent with typical engineering approaches, and could have a substantial impact at key intersections near the proposed facility on the predicted environmental effects.
- CN did not discuss remediation options for situations when queue lengths for some of the left turns would extend beyond the existing storage lanes (for example, Britannia and Trafalgar Roads 2021 p.m. peak).
- Figure 4 of IR2.33-2 did not match Figure 7 of IR2.33-1 in terms of intersection design. It did not show the dedicated right turn eastbound for trucks which crosses a bike lane and CN did not appear to consider this particular vehicle/cyclist interaction and whether additional mitigation would be required given the proposed truck volumes.

Additionally, in its submission to the Review Panel on CN's responses to information request Package 4 (CEAR #672), Halton Municipalities noted that CN's operational analysis of the Terminal Road Access Study multiplied the truck volumes by two, which with Synchro's internal truck factor of two means that one truck was considered to be equivalent to four passenger cars. However, it was not clear from CN's response that it used a truck equivalency of 4.0 Passenger Car Units for its Region-wide capacity calculations.

Information Request:

- a) Explain why CN did not double heavy truck volumes for the analysis of the entire roadway system beyond the facility entrance, as it had in the Terminal Road Access Study.
- b) Identify what mitigation measures could be implemented in the event that truck queue lengths for left turns from Britannia Road into the terminal were to extend beyond existing storage lane capacity.
- c) Explain why the intersection designs shown Figure 4 of Attachment IR2.33-4 of CN's response to information request #2.33 with Figure 7 of Attachment IR2.33-1 are different and indicate which

one of the intersection designs is the one being proposed. In the response, indicate how the intersection design will accommodate cyclist traffic.

- d) Provide the value CN used for truck equivalency of 4.0 Passenger Car Units in its region-wide traffic capacity calculations in EIS Appendix E.17.
- e) Provide a traffic model to predict how traffic on local and regional roads between the Project site and 400-series highways would be affected by Project-generated truck movement in 2031.

8.5 Traffic Safety Studies

Rationale:

In response to the Review Panel's information request #2.33, CN filed 30 Forensic Engineering's reports Safety Assessment of Site Accesses at the Proposed CN Logistics Hub and Safety Assessment of the Proposed CN Logistics Hub (CEAR #592).

In its comments on CN's responses to the Review Panel's information request #2.33 (CEAR #667), Halton Municipalities suggested that several assumptions, projections, factors, safety performance functions, risk assessment, and approaches differed from industry standards. Halton Municipalities filed a review prepared by CIMA+: *Milton Logistics Hub Route Study Peer Review of Safety Assessments, July 16, 2018*. Halton Municipalities suggested there were information deficiencies concerning traffic safety including safety performance functions (SPF), traffic volume assumptions, intersection safety analysis, and mid-block collisions.

Specifically, Halton Municipalities noted that Section 2.0 of Attachment IR2.33-2 indicated CN had conducted a safety assessment of facility access, which included a quantitative analysis of truck and employee accesses to evaluate the future safety effects of increased heavy vehicle volumes. However, CN later stated in Section 3.1 that it had not undertaken a quantitative assessment of the employee access on Tremaine Road as it anticipated limited traffic in this location. Halton Municipalities recommended that CN should nevertheless include a quantitative assessment of the safety impacts of the Tremaine Road access and address how the introduction of the access will impact the safety of the roadway segment of Tremaine Road between Britannia Road and Lower Base Line.

Halton Municipalities also commented that the conversion of the main entrance intersections from three legs to four should intuitively result in more collisions. However, the models used by CN in Attachment IR2.33-1 predict fewer collisions. While CN recognized this inconsistency in information request 2.33-2, it did not propose an alternate technique to better estimate the future collision history for the intersection.

Halton Municipalities noted that CN did not provide an analysis of potential collisions on Britannia Road adjacent to the main truck entrance. Halton Municipalities suggested that there may be collision patterns such as rear-end collisions due to extended queuing on Britannia or sight distance issues that would require mitigation.

Halton Municipalities additionally indicated that Section 4.2.41 of Attachment 2.33-4 provided the results of CN's Safety Performance Analysis for three high frequency intersections, based on Peel Region safety performance functions and considering total collisions. Halton Municipalities recommended that CN also analyse severity of accidents, including all intersections, by considering property damage only, severe, and total collisions separately based on safety performance factors used by Halton Region.

With respect to collision rates at roundabouts, Halton Municipalities noted that CN used the Region of Waterloo as having conditions comparable to the Region of Halton. Halton Municipalities noted that while the Waterloo experience was similar to CN's conclusion of <1% truck collisions expected at the roundabouts on Tremaine Road, the response did not consider the truck volumes that are expected to result from the Project, either as an absolute frequency or as a percentage of traffic volumes. Halton Municipalities suggested that CN calculate the actual expected frequency (number) of truck collisions expected at roundabouts, based on projected Halton/Milton truck volumes on the various corridors.

Halton Municipalities further suggested that CN's calculations in response to information requests #2.33-4 (CEAR #592) and #4.62 a) (CEAR #652) used Region of Peel safety performance functions, rather than those used by the Region of Halton. Halton Municipalities recommended that CN perform a detailed but relatively straightforward computation of the predicted effects on each intersection and road segment that the trucks would travel on, rather than CN's method, which involved extrapolating three intersections to represent all intersections and road segments to be used by MIT truck traffic.

Halton Municipalities was also critical of CN's use of three-year linear extrapolation to predict future accidents to 2021, and recommended basing projections on expected traffic increases to at least 2031 to cover the phase when the Project is fully operational.

Information Request:

- a) Provide a safety analysis for the Tremaine employee and service entrance, including how it will impact the safety of the roadway segment of Tremaine Road between Britannia Road and Lower Base Line.
- b) Explain how the effect of converting the main entrance intersection from three legs to four could reduce accident risks.
- c) Provide an analysis of the accident potential along Britannia road adjacent to the main entrance and identify any required mitigation to address identified impacts.
- d) Provide a revised risk analysis that addresses accident severity.
- e) Provide a revised roundabout risk assessment that accounts for the expected frequency of truck collisions expected at roundabouts, based on projected Halton/Milton truck volumes on the various corridors in the risk calculation.

¹ In CEAR #667 Halton Municipalities included an incorrect reference to section 4.4 of that document. Section 4.4 does not exist and, based on the context of the comment, the Review Panel has inserted the correct reference.

- f) Submit a road safety analysis that calculates the predicted collision outcomes for each intersection and road segment that the trucks would travel on to reach 400-series highways.
- g) Provide a quantitative accident rate estimate for the year 2031, including project generated truck and staff traffic, and accounting for traffic increases due to the projected 2031 population.

Light

8.6 Predictive light effects modelling

Rationale:

In its response to the Review Panel's information request #4.2 (CEAR #646), CN stated that glare is generated by the horizontal component of lighting observed from a receptor sighting toward a luminaire. CN stated that a light trespass assessment includes glare quantification, where glare is the subset of trespass that would horizontally affect receptors adjacent to the site, but did not provide a quantitative assessment of glare effects.

While the Project would add additional background light to the area, CN concluded that there would be no adverse light trespass effect on receptors during operation as the effects would be below 15% of the CIE recommended allowable 2 lux light trespass guideline.

In its submission to the Review Panel on CN's responses to the information request, Halton Municipalities (CEAR #672) noted that CN had not addressed the CIE recommended limits for luminaire brightness (related to glare) in comparing the effects resulting from Project lighting to the baseline condition.

Information Request:

- a) Provide a quantitative assessment of the predicted future glare resulting from Project lighting. Compare the results against baseline conditions and relevant guidelines.
- b) Describe the additive effects of light trespass and glare arising from multiple potential emitters, including fixtures that will be part of the Project and other sources, such as roadway lighting and other developments.

8.7 Light from vehicular traffic

Rationale:

In its response to the Review Panel's information request #4.4 (CEAR #646), CN stated that the off-site light effects assessment from on-site vehicular headlights was based on: the traffic plan for the Town of Milton; the planned changes to the roadways and lighting that are independent of the Project; the increased vehicle traffic volumes associated with the Project; traffic not associated with the Project; the signalized intersection; raised Terminal roadways; and distances from roadways to the nearby receptors.

CN stated that it expected effects resulting from arriving vehicles' headlights to be minimal, as lights would point along the roadway and into the facility. However, exiting vehicles' headlights, including vehicles using the on-site overpass over the CN mainline, would be noticeable, as they would be directed north toward the planned development north of Britannia Road for short periods of time. CN stated that with added street and intersection lighting, non-Project traffic turning into the planned development, and added distance across the roadway from the planned six-lane road expansion, it did not expect changes resulting from the Project to be disruptive.

CN did not provide a quantitative assessment for light from vehicular traffic, but stated that effects would be controlled by mitigation measures such as effective separation distances to minimize light exposure as well as berms or physical barriers between the activities at the site and the nearby receptors.

In its submission to the Review Panel on CN's information request responses, Halton Municipalities (CEAR #672) indicated that CN did not provide the quantitative data necessary to validate the assertions regarding nighttime vehicular activities, in particular, the conclusion that the potential effects on nearby receptors are expected to be noticeable, but not disruptive.

Information Request:

- a) Provide a quantitative assessment of the off-site effects from on-site vehicular headlights. Compare the results against baseline conditions and relevant guidelines where appropriate.

Noise and Vibration

8.8 Applicability of the ambient noise measurements at the points of reception

Rationale:

In Appendix E9 of the EIS, and in its response to the Review Panel's information request #4.65 (CEAR #652), CN stated that the weather data during periods of noise measurement indicated that the weather conditions were conducive to outdoor noise measurements. CN indicated that there were periods of rain and winds exceeding 14 km/hr while it carried out noise sampling.

CN also indicated that anthropogenic noise sources were generally consistent throughout the year and that despite wind and rain effects on the measurements, the baseline noise assessment approach CN presented in EIS Appendix E.9 was representative of the existing conditions. However, CN did not discuss influences from birds and insects during the summer months, the period of time during which the sound level measurements were taken. In its submission (CEAR #549), Halton Municipalities suggested that noise from birds and insects during the summer may result in an overestimation of ambient noise levels during the rest of the year.

In light of the above, it is not clear whether the data collected for the baseline noise levels is representative of baseline conditions.

In addition, in its submission to the Review Panel on the sufficiency of CN's Package 4 responses (CEAR #666), Health Canada suggested that CN should compare the modelled noise data to the measured results in order to validate the noise modelling in relation to actual measured baseline conditions. Health Canada also suggested that CN explain any discrepancies and propose additional mitigation or monitoring measures if required given model uncertainties.

In its submission (CEAR #549), Halton Municipalities found that the weather data used by Stantec was consistent with Environment Canada metrological data for Burlington Piers. According to Halton Municipalities, the Burlington Piers data is located more than 16.5 km from the project site, on the lakeshore, which would be dominated by lake effect winds. Halton Municipalities noted that this would be a completely different meteorological environment from the Project site. Halton Municipalities, in its submission on the sufficiency of CN's Package 4 responses (CEAR #672), further stated that, due to the number of issues identified with several of the measurements taken at various receptors, CN should carry out road and rail traffic noise modelling to validate the estimated baseline ambient noise levels at all points of reception.

Information Request:

- a) Conduct noise modelling to validate that the measured baseline noise measurements are representative of baseline conditions. Confirm whether the noise modeling results would change the findings of the noise assessment in Appendix E.10. If the validation exercise demonstrates that the baseline noise measures are not representative of baseline conditions, provide revised baseline ambient noise levels either through measurement under appropriate meteorological conditions, or through modelling. Whichever method is selected, explain how the revised baseline ambient noise levels were determined.

8.9 Additional noise sources

Rationale:

In its response to the Review Panel's information request #4.66 (CEAR #652), CN assessed the Britannia Road route and indicated that the associated off-site truck traffic on these road segments would result in an increase in future Britannia Road traffic noise levels of 1.5 dB or less, which CN considers to be imperceptible.

However, in its submission on the sufficiency of CN's Package 4 responses (CEAR #672), Halton Municipalities indicated the two main haul routes from the Project would be Britannia Road east towards Highway 407 and Tremaine Road north to Highway 401, but only an assessment of the Britannia Road route had been completed by CN.

Halton Municipalities stated that the traffic volumes used in CN's assessment of the Britannia Road route are for the year 2031 and predictive of higher traffic volumes. As the CN facility may be in operation prior to 2031, using higher traffic volumes for the 2031 timeframe may underestimate the

effects of truck noise along potential haul routes during the initial operating years of the Project (i.e. adding the Terminal truck traffic to higher forecasted traffic volumes could reduce the apparent impact of the truck noise in lower traffic numbers).

In addition, Halton Municipalities indicated that the second major haul route, along Tremaine Road, would require the completion of the Tremaine Road realignment and completion of the planned interchange at Highway 401. The traffic volumes used in CN's haul route analysis along Britannia Road assume this realignment and interchange will be in place. If the CN facility is in operation prior to these road network improvements taking place, Halton Municipalities suggested that truck traffic would also need to travel along Britannia Road or other local roads, increasing the potential for noise effects in those locations. Halton Municipalities stated that CN should complete the assessment of the Tremaine Road leg of the haul route.

Responding to information request #4.66 (CEAR #652), CN indicated that the largest increase in project sound levels would be 1.4 dB at Tremaine Road. Tables 5.1.to 5.4 in Appendix E.10 show that some of the highest noise levels occur near Tremaine Road.

In its submission to the Review Panel on CN's Package 4 information request responses (CEAR #666), Health Canada stated that there can be a substantial increase in the percent highly annoyed (%HA) with relatively small changes in the noise environment in situations where the initial baseline noise level is high. This is due to the non-linear nature of the relationship between noise and %HA. In its response to the information request #4.66, CN provided a revised noise assessment noting increased sound levels due to the project in decibels (dB) but did not included an assessment of the change in %HA. Health Canada states that health effects resulting from project-generated noise should be evaluated using criteria based on the change in %HA rather than using the increase in sound pressure level as presented in Table 4.66-1.

In addition, Health Canada stated that CN's response to information request #4.78 indicated that measured baseline noise levels were in excess of 40dBA Ln at the noise monitoring stations. Given that reported baseline noise levels exceed the World Health Organization criteria, Health Canada suggested that an assessment of potential human health effects using change in %HA would be more appropriate.

Health Canada further recommended that CN should not categorize audible noise sources as imperceptible because such statements can be misleading given that noise perception is individual and subjective.

Information Request:

- a) Provide an assessment of haul route noise impacts along Tremaine Road as well as Britannia Road, using the change in %HA methodology as per Health Canada's *Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise*, Healthy Environments and Consumer Safety Branch, 2017. The calculations should take into consideration the traffic volumes at the time of full Terminal operation. In the Tremaine Road analysis, discuss the effect of timing of road network

improvements such as the planned Tremaine Road realignment and interchange construction on predicted haul route noise levels. Provide supporting calculations.

- b) Verify that the revised analysis would not change the expected requirements for mitigation identified in Appendix E.10.

8.10 Adjustment values for noise sources

Rationale:

In response to the Review Panel's information request #4.67 (CEAR #652), CN indicated that when it modelled noise from mainline trains performing "doubling over" within the Terminal (breaking a train into two or more sections to fit on the pads tracks for loading/unloading) it had added a regular impulsive penalty of + 5 dB to the predicted sound level to take into account the impulsive characteristics of the banging noises.

In its submission to the Review Panel on CN's information request responses, Health Canada (CEAR #666) noted it considers that a +12 dB adjustment for shunting and marshalling within the terminal would be more appropriate for high-level intensive impulsive noise, rather than the 5 dB regular impulsive adjustment CN had used. This approach also aligns with Canadian Transportation Agency Railway Noise Measurement and Reporting Methodology guidelines (2011) and Annex A of ISO 1996-1:2016.

Information Request:

- a) Adjust the predicted noise emissions from train assembly noise by +12 dB. Confirm whether and how this would change the findings of the noise assessment in Appendix E.10, and whether additional mitigation measures would be required to reduce noise levels offsite.

8.11 Detailed description of the noise sources

Rationale:

In response to the Review Panel's information request #4.68 (CEAR #652), CN provided a detailed description of noise sources including various tables with octave band sound data and details outlining sound character adjustments, location, speeds, etc. CN had previously stated (CEAR #592) that the trains entering/exiting the terminal would be based on demand, but would typically range between 8000 feet (2,438 metres) and 14,000 feet (4267 metres) in length, which represents up to 140 railcars per train. In its response to the Review Panel's information request #4.79 (CEAR #652), CN indicated that prior to departure, an outbound train may idle on the "terminal leads" for some period of time. The terminal leads would be located on the portion of the track north of Louis St. Laurent Ave, near existing and approved residences.

In its submission to the Review Panel on the sufficiency of CN's Package 4 responses (CEAR #672), Halton Municipalities identified that the sound power used for a single idling locomotive was too low in comparison to the sound power level outlined in the Canadian Transportation Agency's *Railway Noise Measurement and Reporting Methodology, 2011*. In addition, Halton Municipalities noted that freight trains typically incorporate up to four locomotives for a 140-car train and suggested that CN's assumption of three idling locomotives was not a conservative estimate.

Halton Municipalities noted that some containers brought into the facility would have built-in heating and cooling equipment, and are listed as Heated Containers (CHE_1_S), Domestic Reefers (DRE_1_S), and International Reefers (IRE_1_S). From Attachment IR4.68-2 of CN's response, over a 24-hour period CN predicts that there would be 200 domestic reefers, 32 heated containers, and 96 international reefers present on the terminal site. Halton Municipalities stated that these units would operate continuously on-site while on the train, or stacked on the ground, until they are shipped off-site. However, the noise modelling appears to have only considered noise from these units during the brief period when they would be driven off-site. Accordingly, Halton Municipalities suggested the omission of these sources under-predicts potential noise impacts.

Halton Municipalities further indicated that the Terminal operations would include coupling and uncoupling of trains as part of doubling over and assembling trains to leave the terminal (a shunting operation). The resulting noise would be a "knuckle thump" as the trains stretch and compress as they leave the terminal. Halton Municipalities suggested that CN should take into consideration the impulsive noise that would occur when trains stretch and compress throughout the project.

Halton Municipalities also submitted that wheel squeal may occur at the terminal. Wheel squeal is caused by lateral slippage of the train wheels over the track as the train negotiates a curve. Halton Municipalities referenced a report from the U.S. FTA Transit Cooperative Research Program that stated that "for a wheel base of 7.5ft, wheel squeal would not be expected for curve radii greater than 410 to 830 ft". Halton Municipalities requested that CN confirm whether the proposed curve radii would meet this criterion, or whether train operations would generate wheel squeal.

In its response to information request #4.68 (CEAR #652), CN noted that it excluded back up alarms and train whistles from the noise assessment, because they are a legislated safety requirement. However, in its submission to the Review Panel on the sufficiency of CN's Package 4 responses (CEAR #666), Health Canada indicated that back up alarms and train whistles during the operations phase may generate noise levels that disturb nearby human receptors. Health Canada also states that although whistles and backup alarms are necessary safety features, ways to minimize the effects of these sources should be addressed.

Information Request:

- a) Provide updated operational noise modelling. The noise modelling should:
 - Use a conservative noise emission value for locomotives consistent with values provided by CTA, for instance 107 dBA sound power level for a single idling locomotive;

- Adjust the model to include the appropriate number of idling locomotives;
- Include an assessment of noise from heated/cooled containers (“reefers”) as they sit onsite in the facility, and not just as they are trucked out;
- Include impulsive noise from the coupling and uncoupling and stretching of trains (knuckle thumps);
- Include wheel squeal as a noise source (including the appropriate penalty to account for the tonality of such source), where CN confirms that track turning radii are less than 410ft; and
- Include train whistles and back up alarms used during the operations phase. If required, address additional mitigation measures. Refer to Appendix HI of Health Canada's *Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise*, Healthy Environments and Consumer Safety Branch, 2017 for suggestions on additional mitigation measures and alternatives.

8.12 Receptor heights

Rationale:

In Attachment IR4.71-1 of its response to the Review Panel’s information request 4.71 (CEAR #652), CN provided the assumed noise receptor building heights it had used to predict the Project’s noise effects. In its submission to the Review Panel on the sufficiency of CN's Package 4 responses (CEAR #672), Halton Municipalities stated that there were a number of inconsistencies in the analysis, which could affect prediction results and evaluations of the effectiveness of noise barriers:

- G1-POR023 is actually 2 storeys high. A receptor height of 4.5 m should have been used.
- G1-POR025 is currently vacant. To be consistent with the surrounding land uses, a receptor height of 4.5 m should have been used.
- G1-POR026 is actually 2 storeys high. A receptor height of 4.5 m should have been used.
- G2-POR001 through 004 are existing homes in the Boyne Secondary Plan Area which currently includes 2 storey and 3-storey residences. A height of 7.5 m should be used to represent 3-storey residences.
- G3-POR001 through 008 are intended to represent proposed future homes in the Boyne Secondary Plan Area. Again, 2-storey homes were modelled. However, as discussed above, 3-storey homes are characteristic of the area. A 3-storey receptor height of 7.5 m should have been used.

Information Request:

- a) Revise the noise assessment to include the adjusted receptor heights and confirm whether this would change the findings of the noise assessment in Appendix E.10.

8.13 Construction noise sources

Rationale:

In its response to the Review Panel's information request #4.74 (CEAR #652), CN stated that they modelled the concrete batch plant as a hemi-spherical point source, and railway liners, tampers, and regulators as line sources. CN indicated that they modelled the remaining construction sources, such as dump trucks, graders excavators, etc., as area sources assuming that such construction equipment could operate anywhere within the Project Development Area. CN states that modelling construction equipment as fixed concentrations of noise sources at certain locations closer to the PORs for extended periods of time would not represent a realistic scenario.

However, in its submission on the sufficiency of CN's Package 4 responses (CEAR #672), Halton Municipalities stated that certain types of construction operations would be localized in one area for much of the construction phase, with significant amounts of equipment operating for extended periods of time, including equipment associated with:

- The construction of the grade separation at Lower Base Line and the on-site overpass over the CN mainline;
- Construction of facility buildings; and
- Pipeline relocation and horizontal directional drilling.

Halton Municipalities further stated that these activities would occur near clusters of existing residences, though it did not identify the specific location of the residences of concern. Halton Municipalities suggested that treating these sources as part of an overall area source instead of as point sources would likely under-predict construction noise impacts.

Information Request:

- a) Conduct additional modelling based on construction noise sources originating at specific locations, including construction activities at the grade separations at Lower Base Line and the on-site overpass over the CN mainline, activities at facility buildings, and activities for pipeline relocation and horizontal directional drilling. Once the model has been revised, confirm if the results would change the findings of the noise assessment in Appendix E.10.

8.14 Self-screening from buildings

Rationale:

In information request #4.75, the Review Panel requested that CN explain whether it considered self-screening from receptor buildings in its noise assessment. In its response (CEAR #652), CN indicated that it had considered self-screening in its baseline noise measurements and avoided screening of buildings in the selection of monitoring locations.

However, in its submission to the Review Panel on the sufficiency of CN's Package 4 responses (CEAR #672), Halton Municipalities stated that the issue is not related to whether the monitoring locations were screened by buildings, but rather it is related to the fact that the existing houses, which are the points of reception, provide their own "self-screening". This would create different exposures to noise sources in the environment. Halton Municipalities stated that baseline ambient noise levels in an unscreened area do not necessarily represent the baseline ambient sound levels received at different facades of a home.

Therefore, it is not clear if the appropriate adjustments were incorporated to account for the screening that would occur depending on the orientation of the dwelling with respect to the roadway, railway line and proposed facility.

Information Request:

- a) Apply the appropriate adjustments to account for the self-screening from receptor buildings and update the noise assessment as appropriate.

8.15 Contribution of noise sources at points of reception

Rationale:

In information request 4.76, CN was asked to provide a table that identifies the noise contribution of individual noise sources for each point of reception. CN did not provide the information in its response (CEAR #652).

In its submission to the Review Panel on the sufficiency of CN's Package 4 responses (CEAR #666), Health Canada noted that the requested information should be provided and the CadnaA software is capable of generating the information requested in a table format. In its submission to the Review Panel on the sufficiency of CN's Package 4 responses (CEAR #672), Halton Municipalities indicated that this information is important to determine the magnitude of resulting noise levels at residential receptors.

Information Requests:

- a) Provide the information requested in IR4.76 in the table format generated by CadnaA to allow evaluation of the specific noise contribution of the individual noise sources for each point of reception.

8.16 Existing and future receptors

Rationale:

In information request #4.77, the Review Panel requested that CN revise its noise analysis to include existing and future sensitive receptors within 1 km of the property line, including houses located on CN land.

In its response to information request #4.77 (CEAR #652), CN stated that receptor G2-POR001 was representative of all receptors within a large area, which, based on the Panel's review, comprises of hundreds of residences over an approximately 1 Ha area. Based on a review of the area, it does not appear that G2-POR001 is representative of noise effects, especially given the fact that there are houses closer in proximity to Terminal operations with higher receptor heights than those considered in the study. (The study only considered receptor heights up to 4.5 m; however, as noted in information request 8.12 (Follow-up to IR4.71: Receptor Heights) above, 3-storey receptor heights of 7.5 m should be considered in the Boyne Secondary Plan Area.)

In its submission to the Review Panel on the sufficiency of CN's Package 4 responses (CEAR #672), Halton Municipalities stated that additional PORs are required in the Boyne Secondary Plan Area because G2-POR001 is not necessarily representative of worst case impacts over the entire area.

Further, as noted by Halton Municipalities in its submission to the Review Panel on the sufficiency of the EIS (CEAR #549) and in information request #4.71 analysis above, the proper receptor heights were not considered in the original model and should be used in the revised model.

Information Request:

- a) Revise the noise analysis to include additional receptors within the Boyne Secondary Plan Area and to address existing sensitive receptors within 1 km of the property line of the facility using the appropriate receptor heights as noted by Halton Municipalities in its submission to the Review Panel on the sufficiency of CN's Package 4 responses. Depending on the outcome of information request 8.8 (Follow up to IR4.65: Applicability of the ambient noise measurements at the points of reception), and if the baseline conditions are found to be lower than the World Health Organization criteria, re-evaluate sleep disturbance in accordance to the procedures outlined in Health Canada's *Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise, 2017*.

8.17 Low frequency noise

Rationale:

In its submission to the review panel on the sufficiency of the EIS (CEAR #533), Health Canada stated that in Table 4.5 of Appendix E.10, CN did not account for noise sources that may contain strong, low frequency content, and noted that receptors may experience stronger annoyance reactions to these kinds of sources.

The Canadian Transportation Agency's [Noise and Vibration from Idling Locomotives](#) publication states idling locomotives create low frequency noise. Noise from low frequencies can travel over long distances with little attenuation or reduction in strength. The noise can penetrate through buildings, even when windows are closed, and cause objects to resonate or rattle. Also, as a building's sound insulation tends to reduce the impact of higher frequencies, it may exacerbate the effect of low frequency sounds inside

the building. Airborne noise at low frequencies can also induce the vibration of lighter elements of a building, and may be incorrectly perceived as ground-borne vibration.

In its response to information request #4.79 (CEAR #652), CN considered low frequency noise in the 31.5 Hz and 63 Hz octave bands and concluded that the annoyance at the nearest residences is expected to be minimal. CN concluded that predicted noise impacts for operational noise remained unchanged and would not warrant additional mitigation. CN also indicated that humans do not hear noises below 20Hz and therefore noise measurements below 31.5 Hz are typically not collected. Further, CN indicated that noise propagation modelling in CadnaA is not available for frequencies below 31.5Hz.

In its submission to the Review Panel on the sufficiency of CN's Package 4 responses (CEAR #666), Health Canada noted that according to the American National Standards Institute's Quantities and Procedures for Description and Measurement of Environmental Sound Part 4: Noise Assessment and Prediction of Long-Term Community Response (2005), annoyance associated with rattles from these low-frequency noise (LFN) sources may be prevented if the sound levels in the 16-, 31.5- and 63-Hz octave are less than 70 dB.

Health Canada also stated that low frequency noise is not generally well perceived by the human ear. However, this type of noise may induce vibrations in lightweight structures in residences or sleeping quarters that may be perceptible or cause a "rattle." The properties of low frequency noise allow it to travel farther distances with less atmospheric attenuation than higher frequencies. Studies indicate that low frequencies (below 100 Hz) are only attenuated by 3 dB per doubling of distance downwind of noise sources for distances of 0.3 to 20 km, and attenuated by 6 dB per doubling of distance upwind of noise sources from 0.4 to 3 km. Low frequency noise is also less susceptible to conditions that mitigate the transfer of noise from outdoors to indoors including structural barriers, environmental conditions, and topography. Research indicates that annoyance related to noise is greater when low frequency noise is present (ISO 1996-1:2016) because of the rattling effect. In addition, very little change in the sound pressure level at lower frequencies is needed to have a disproportionate increase in subjective loudness. This annoyance may result in increased complaints from nearby residents.

Health Canada further stated that to prevent rattles from low frequency noise and the associated annoyance from this effect, the American National Standards Institute (ANSI) indicates that the (energy) sum of the sound levels in the 16-, 31.5- and 63-Hz octave bands should be less than 70 dB. If the "rattle criterion" exceeds 70-dB, Health Canada advised that proponents should implement feasible mitigation measures. ANSI S12.9-2005 indicates that there is evidence that noise-induced rattles are very annoying, and this annoyance may be independent of the number or duration of events. Additionally, ANSI S12.9-2005 provides a more sophisticated mathematical procedure for assessing percentage highly annoyed (%HA) when low frequency noise is present. Health Canada advises using this procedure when the C-weighted Ldn exceeds the A-weighted Ldn by more than 10 dB. This is further outlined in Appendix D of the American National Standards Institute Quantities and Procedures for Description and Measurement of Environmental Sound Part 4: Noise Assessment and Prediction of Long-Term Community Response (ANSI S12.9-2005/Part 4), Standards Secretariat Acoustical Society of America.

Health Canada also states that the correct interpretation of the ANSI S12.9-2005/Part 4 standard has been applied for the project. Although 16 Hz estimates are not available, the low frequency noise estimates show 31.5 Hz is lower than 63 Hz. To ensure there is no strong 16 Hz fundamental component it should be confirmed whether locomotive idling speeds fall within the 16 Hz octave band.

Information Request:

- a) Confirm whether locomotive idle speeds are expected to be within a revolution per minute (rpm) range that could result in elevated low frequency noise (LFN) in the 16 Hertz (Hz) octave-band. If they are, update the noise assessment for change in %HA as per ANSI (2005). Describe any additional mitigation measures that might be required if noise exceeds acceptable levels as a result of this analysis.

8.18 Vibration effects for participating receptors

Rationale:

In its submission to the Review Panel on the sufficiency of CN's Package 4 responses (CEAR #[672](#)), Halton Municipalities states that construction vibration impacts at participating receptors have not been discussed. Two participating receptors, E19 and E20, are located on the South side of Base Line Road, on land currently owned by CN (Attachment IR4.77-1). These residences are located in close proximity to the rail grade separation at Lower Base Line to be constructed as part of the project. Construction vibration, especially from pile driving, may affect these locations.

Information Request:

- a) Provide an assessment of construction vibration impacts at participating receptors, particularly E19 and E20.

Socio-economic

8.19 Project-induced changes on designated agricultural lands

Rationale:

In its response to the Review Panel's information request #4.20 (CEAR #[656](#)), CN stated that the Project would result in the removal of 30 ha of land designated as Prime Agricultural Area in the Halton Region Official Plan. CN further stated that the Halton Regional Official Plan designates 1,141 ha of Prime Agricultural Area in the Local Assessment Area and that the loss of those 30 ha of land represented a reduction of 0.3% of total Prime Agricultural Area in the Local Assessment Area.

However, the loss of 30 ha of Prime Agricultural Area out of a total of 1,141 ha of Prime Agricultural Area would result in a 2.6% reduction in Prime Agricultural Area in the Local Assessment Area.

Information Request:

- a) Clarify whether the difference in values is an error, or provide additional details to indicate how CN calculated that the Project would result in a reduction of 0.3% of total “Prime Agricultural Area” in the Local Assessment Area.

Wildlife

8.20 Consideration of potential species at risk at the South Milton site

Rationale:

In its responses to the Review Panel’s information request #1.3 (CEAR #[561](#) and #[574](#)), CN considered Western Chorus Frog to be absent from the local assessment area. In its responses to the Review Panel’s information request #5.8 (CEAR #[647](#)), CN noted that Western Chorus Frog may occur in the regional assessment area but predicted that potential adjacent habitats would not be disturbed by operations with the proposed noise mitigation in place.

In its comments on CN’s response to the Review Panel’s information request #2.12, Halton Municipalities (CEAR #[667](#)) indicated that data from the Town of Milton (2014 and 2016) documented Western Chorus Frog immediately adjacent to the CN tracks. It is unclear exactly where the species was documented in relation to the Project and whether CN has considered this information.

Information Request:

- a) Clarify whether and how CN considered the Town of Milton’s 2014 and 2016 data that documented the presence of Western Chorus Frog near the existing CN mainline tracks. If CN has not yet considered this information, discuss whether the information changes any of the effects predictions in the EIS or whether additional mitigation would be necessary for Western Chorus Frog.