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Milton Logistics Hub

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From:
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Date:
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To:
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CC:
Stantec Consulting Ltd.

Memo

Milton Logistics Hub Construction Noise – Condition 9.2 Sleep Disturbance Assessment

Introduction

AECOM Canada Ltd. (AECOM) was retained by the Canadian National Railway Company (CN) to conduct a detailed sleep disturbance analysis (SDA) for Phase 1 construction activities related to the Milton Logistics Hub Project (the Project). The completion of the SDA is in accordance with the requirement under Condition 9.2 in the Decision Statement issued by the Minister of the Environment (2021) issued for the Project under Section 54 of the Environmental Assessment Act, 2012. Condition 9.2 states the following:

“The Proponent shall conduct, prior to construction and in consultation with Health Canada, a sleep disturbance analysis based on an evaluation of the distribution of baseline and predicted nighttime noise events. If the results of this evaluation demonstrate that nighttime noise events attributed to the Designated Project may exceed 60 dBA Lmax outdoors more than 15 times per night, at any point of reception identified by the Proponent on figure 3 of the Technical Data Report Noise Effects Assessment (Appendix E.10) (Canadian Impact Assessment Registry Reference Number 80100, Document Number 57), the Proponent shall develop, in consultation with Health Canada, and implement, prior to construction, modified or additional mitigation measures to ensure that nighttime noise events attributed to the Designated Project do not exceed 60 dBA Lmax outdoors more than 15 times per night at any point of reception. The Proponent shall submit the results of the analysis and any modified or additional mitigation measure to the Agency prior to implementing them.”

This memorandum provides the SDA results associated specifically with Phase 1 construction activities by incorporating updated detailed design information to the previously submitted *Environmental Impact Statement Appendix E.10 – Milton Logistics Hub – Technical Data Report Noise Effects Assessment* (Stantec TDR) (Stantec 2015).

Assessment Methods

Noise Sensitive Receptors

Noise sensitive receptors included in this study were consistent with those presented in the Stantec TDR but limited to those that were contained within a 1.0 km area surrounding the Project. A summary of all noise sensitive receptors included in the analysis is provided in **Attachment A**. The analysis considered a variety of noise information. Detailed information on the

nighttime baseline sound levels at each receptor location is provided in the Technical Data Report - Baseline Ambient Noise Study (Stantec).

Noise Limits

Phase 1 of Project construction does not include intermittent or event-based sources of noise. Nevertheless, the maximum sound level of 60 dBA was used for the assessment and is considered conservative. This approach also addresses Decision Statement Condition 9.2 requiring the implementation of mitigation measures if nighttime noise events attributed to the Project exceed a maximum sound level (L_{max}) of 60 dBA more than 15 times per night.

Modelling Methods

Sound propagation calculations for predicting noise levels were conducted using the same methods as the Stantec TDR, which were in accordance with the following International Organization for Standardization (ISO) standards:

- ISO 9613-1:1993 Attenuation of sound during propagation outdoors – Part 1: Calculation of the absorption of sound by the atmosphere.
- ISO 9613-2:1996 Attenuation of sound during propagation outdoors – Part 2: General method of calculation.

Meteorological parameters and ground attenuation values were setup in the acoustic modelling calculations. Sound levels were predicted for a temperature of 10° C and a relative humidity of 70%. A ground absorption factor for relatively absorptive ground, $G=0.75$, was used. Additional information relating to the propagation analysis methods may be referred to in the Stantec TDR.

Sound sources were generally modelled as either point, line or area depending on their type and expected usage. Specifically:

- Stationary sound sources (e.g., water pumps) that emit into the environment from a fixed position were modelled as point sources.
- Mobile sources moving along a known or fixed path (e.g., rail spikers) were modelled as line sources.
- Mobile sources operating in a defined area (e.g., excavators) but not along a fixed path were modelled as area sources.

Noise Emission Data and Scenarios

A noise source inventory was provided by the engineering design team based on the current construction schedule (See **Attachment B**) that also include the quantity and expected usage for all equipment. The noise emission levels for the equipment inventory were determined based on a combination of published data, AECOM's measurement database of similar equipment, and commonly accepted engineering prediction methods. Additionally, the emission levels also incorporated adjustments for the expected quantity and usage rates as well as sound source characteristics (where applicable) for all equipment. Finally, a number of equipment items in the provided source inventory were identical to those included in the Stantec TDR. In such cases, the sound power level for these sources matched the Stantec TDR to maintain consistency between the two assessments.

Modelled Scenario

The SDA was completed based on the assumption that all construction activities with nighttime equipment usage occur concurrently. This assumption is considered conservative resulting in an over prediction of the impact since it is both unlikely and, in some cases, not physically possible for all activities to occur concurrently.

Modelling Results and Conclusion

A summary of the unmitigated modelling results is provided in **Attachment C**. The prediction results indicated that Project construction activities during Phase 1 may be completed without exceeding the defined noise limit for sleep disturbance. Correspondingly, additional mitigation measures are also not required.

Attachment A: Project Noise Sensitive Receptors

A summary of the project-wide points of reception (POR) as per the Stantec TDR is provided in Table 1. PORs specifically excluded as a part of this supplementary study are highlighted. These highlighted PORs are located outside of the defined study area or are future developments which would not exist during the construction period. As per the Stantec TDR, the PORs have been separated into three (3) distinct grouping categories. The definitions of these categories are:

- **Group 1:** Farmhouses and isolated residences co-existing with existing CN infrastructure; generally, PORs to the east, west and south are within this group.
- **Group 2:** Subdivision/urban developments located north of the proposed Project towards Derry Road.
- **Group 3:** Future subdivision/urban developments being proposed to the north of the Project but closer to Britannia Road.

Table 1. Project Noise Sensitive Receptors

POR ID	POR Group	Description	UTM (Easting) [m]	UTM (Northing) [m]	Height [m]
G1-POR001	1	House on 1st Line - 1	595065	4812400	4.5
G1-POR002	1	House on 1st Line - 2	594666	4813022	4.5
G1-POR003	1	House on 1st Line - 3	594317	4813353	4.5
G1-POR004	1	House on Bronte Street - 1	593149	4814485	4.5
G1-POR005	1	House on Tremaine Road - 1	592891	4813149	4.5
G1-POR006	1	House on Tremaine Road - 2	593126	4812646	4.5
G1-POR007	1	House on Tremaine Road - 3	593687	4811986	4.5
G1-POR008	1	House on Tremaine Road - 4	594106	4811756	4.5
G1-POR009	1	House on Tremaine Road - 5	594617	4811397	4.5
G1-POR010	1	House on Tremaine Road - 6	594745	4811274	4.5
G1-POR011	1	House on Lower Base Line - 1	594896	4811314	1.5
G1-POR012	1	House on Tremaine Road - 7	594865	4811160	4.5
G1-POR013	1	House on Tremaine Road - 8	594884	4811038	4.5
G1-POR014	1	House on Tremaine Road - 9	595103	4810842	4.5
G1-POR015	1	House on Tremaine Road - 10	595539	4810511	4.5
G1-POR016	1	House on Tremaine Road - 11	595884	4810213	1.5
G1-POR017	1	House on Burnhamthorpe Road - 1	596342	4810550	4.5
G1-POR018	1	House on Lower Base Line - 2	595297	4811755	4.5
G1-POR019	1	House on Lower Base Line - 3	595312	4811845	4.5
G1-POR020	1	House on Lower Base Line - 4	595514	4811834	4.5
G1-POR021	1	House on Lower Base Line - 5	595631	4812235	4.5
G1-POR022	1	House on Tremaine Road - 12	595732	4810196	4.5
G1-POR023	1	House on Tremaine Road - 13	593172	4812908	4.5

POR ID	POR Group	Description	UTM (Easting) [m]	UTM (Northing) [m]	Height [m]
G1-POR024	1	House on Tremaine Road - 14	592853	4813023	1.5
G1-POR025	1	House on Tremaine Road - 15	593367	4812549	4.5
G1-POR026	1	House on Tremaine Road - 16	593382	4812522	4.5
G2-POR001	2	Existing Subdivision - 1	591680	4815513	7.5
G2-POR002	2	Existing Subdivision - 2	591036	4816252	7.5
G2-POR003	2	Existing Subdivision - 3	591762	4815597	7.5
G2-POR003a	2	Existing Subdivision - 3a	591859	4815553	7.5
G2-POR004	2	Existing Subdivision - 4	591129	4816331	4.5
G3-POR001	3	Future Development - 1	593048	4814036	7.5
G3-POR002	3	Future Development - 2	592520	4814667	7.5
G3-POR003	3	Future Development - 3	592388	4814825	7.5
G3-POR004	3	Future Development - 4	592254	4814988	7.5
G3-POR005	3	Future Development - 5	592990	4813960	7.5
G3-POR005a	3	Future Development - 5a	592734	4813886	7.5
G3-POR006	3	Future Development - 6	592441	4814608	7.5
G3-POR007	3	Future Development - 7	592307	4814763	7.5
G3-POR008	3	Future Development - 8	592167	4814924	7.5

Note: The highlighted PORs are excluded in the SDA.

Attachment B: Phase 1 Construction Schedule



CN Milton Logistics Hub

Condition 15.2 - IAAC Construction Schedule

ID	Task / Activity Name	Month	Phase 1										Phase 2										Phase 3							
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
P1	Phase 1																													
P1-A	Site preparation - mobilization/internal temporary access route																													
P1-B	Select Phase 1 vegetation removal																													
P1-C	CN owned building removal																													
P1-D	Installation of select mitigative berms/barriers, including grading/naturalization																													
P1-E	Installation of storm water management (Pond 1)																													
P1-F	Installation of storm water management (Pond 2)																													
P1-G	Habitat enhancements and new dry channel for Indian Creek																													
P1-H	Habitat enhancements and new dry channel for Tributary A																													
P1-I	Diversion of Indian Creek into new channel																													
P1-J	Diversion of Tributary A into new channel																													
P1-K	Installation of temporary track for existing mainline tracks																													
P1-L	Pole relocation																													
P1-M	Sun Canadian pipeline relocation																													
P2	Phase 2																													
P2-A	Select Phase 2 vegetation removal																													
P2-B	Grading, drainage, ditches and culverts																													
P2-C	Utility installation and connection																													
P2-D	Lower Base Line grade separation																													
P2-E	Onsite truck access road and overpass																													
P2-F	Installation of mainline tracks between Britannia Road and Derry Road																													
P2-G	Realignment of the mainline tracks between Lower Base Line and Britannia Road																													
P2-H	Construction of administration and maintenance garage (including charging stations)																													
P2-I	Installation of service tracks and pad tracks																													
P2-J	Installation of mainline turnouts and connecting to new mainline tracks																													
P3	Phase 3																													
P3-A	Connection of service tracks and pad tracks to mainline tracks																													
P3-B	Paving of terminal, employee parking, storage pad, and all connecting driveways																													
P3-C	Installation of gates, bollards, pavement markings, signage, and related works																													
P3-D	Demobilization																													

Footnote - Our intention is to begin construction as soon as possible, with an expectation of no sooner than Sept 28 2021. This assumes all necessary approvals are received in a timely manner.

Attachment C: Unmitigated Model Prediction Results

Table 2. Sleep Disturbance Noise Assessment (Unmitigated)

POR ID	Description	Predicted Project Lmax Night (dBA)	Exceed Sleep Disturbance? (60 dBA Lmax) [Yes/No]
G1-POR001	House on 1st Line - 1	42	No
G1-POR002	House on 1st Line - 2	41	No
G1-POR003	House on 1st Line - 3	41	No
G1-POR004	House on Bronte Street - 1	38	No
G1-POR005	House on Tremaine Road - 1	42	No
G1-POR006	House on Tremaine Road - 2	43	No
G1-POR007	House on Tremaine Road - 3	45	No
G1-POR008	House on Tremaine Road - 4	47	No
G1-POR009	House on Tremaine Road - 5	48	No
G1-POR010	House on Tremaine Road - 6	44	No
G1-POR011	House on Lower Base Line - 1	45	No
G1-POR012	House on Tremaine Road - 7	41	No
G1-POR013	House on Tremaine Road - 8	40	No
G1-POR014	House on Tremaine Road - 9	37	No
G1-POR015	House on Tremaine Road - 10	33	No
G1-POR016	House on Tremaine Road - 11	26	No
G1-POR017	House on Burnhamthorpe Road - 1	27	No
G1-POR018	House on Lower Base Line - 2	45	No
G1-POR019	House on Lower Base Line - 3	44	No
G1-POR020	House on Lower Base Line - 4	40	No
G1-POR021	House on Lower Base Line - 5	36	No
G1-POR022	House on Tremaine Road - 12	29	No
G1-POR023	House on Tremaine Road - 13	45	No
G1-POR024	House on Tremaine Road - 14	40	No
G1-POR025	House on Tremaine Road - 15	47	No
G1-POR026	House on Tremaine Road - 16	48	No