September 26, 2023

DRAFT

To: **Sergio Campoli** **Via e-mail:**
Toronto District School Board **sergio.campoli@tdsb.on.ca**

Re: **Comments on Metrolinx response to ECOH Reports**
ECOH Project No. 27704

1. INTRODUCTION

ECOH has reviewed the memo from Metrolinx dated August 24, 2023 with respect to ECOH's comments of May 18, 2023 on Metrolinx' Health and Safety Plan for Ontario Line construction near Pape Avenue Junior Public School. The Metrolinx memo also provides comments on ECOH's noise monitoring reports of May 18 and June 20, 2023. We offer the following comments regarding points made in the memo.

2. BASIS FOR NOISE TARGETS

2.1 Impacts of Noise

Metrolinx comments that "ECOH states that the guidelines identified in the [Metrolinx March 2023] H&S Plan are "not appropriate as standards for noise levels in schools" (pg. 3)." This comment misinterprets ECOH's statement, which was referring to Metrolinx' citation of the Ontario noise regulation. ECOH's May 18 report said, "The Ontario noise regulation and other guidelines designed to protect against hearing loss are not appropriate as standards for noise levels in schools." ECOH went on to say, "the criterion for noise limits should not be based on hearing loss." We continue to hold this position, in view of impacts of noise on health and education quality, and the probable greater vulnerability of children to noise compared to adults. Metrolinx apparently accepts that construction noise levels should be lower than the limits imposed by the Ontario noise regulation.

2.2 Average background level

Metrolinx states that the background level of noise outdoors at PAJPS should be considered to be 64 dBA, rather than 63 dBA. ECOH based its recommendation on Metrolinx' own noise monitoring, which found an average of 63 dBA in 3 of 4 measurement series taken on March 9 and March 21, 2023, as reported in its memo of April 6, 2023 and reproduced in the August 24 comments.

2.3 One-Hour Averaging Time

Metrolinx states that its 69 dBA limit should be applied as an 11-hour average (7:00 a.m. to 6:00 p.m.), disagreeing with ECOH's recommendation that limits should be applied as a one hour

average. ECOH continues to believe that a one hour averaging time is appropriate, for the following reasons:

- Averaging noisy periods with quiet periods could allow very high levels during noisy operations. For example, if noise averaged 62 dBA for 10 of the 11 hours (which is consistent with background noise measurements by Metrolinx), noise levels as high as 76.5 dBA for one hour would be acceptable, as the 11-hour average would remain below 69 dBA.
- A one hour averaging period would allow remedial action to be taken on the basis of shorter term measurements. If it were necessary to monitor for 11 hours before determining whether targets had been exceeded, there would be no opportunity to intervene when noise levels are excessive.

2.4 Action Level vs Limit

Metrolinx states, "ECOH concludes that an outdoor 66dBA Leq 1-hr limit should be adopted for the project." This is a misinterpretation of ECOH's recommendations. ECOH did not recommend that 66 dBA be the limit, but rather the **action level** to trigger further noise reduction efforts. This recommendation is based on the following considerations:

- An action level must be below the limit, so that remedial action can be taken before the limit is reached. The Metrolinx plan acknowledges this, stating that "Warning/review levels will be set lower than those noted in Table 4-1, to provide opportunity for adaptive management where feasible prior to any potential exceedance." (Metrolinx uses "warning/review levels" with the same meaning as ECOH uses "action levels".) However, the August 24 memo contradicts this, stating that "noise monitors are set to the limits identified in the H&S Plan (Table 4-1), to be addressed as Alerts (i.e., warning) at the monitoring location (i.e. barriers)." In other words, here Metrolinx states that "warning levels" are the same as the limit. This contradicts the concept of warning or action levels.
- As stated in our May 18 comments, the action level should be 3 dBA above background. This is based on our interpretation of the Beis and Hansen reference. A "just perceptible" level above background is appropriate as a trigger for action, before it reaches the "clearly perceptible" level. ECOH notes that Beis and Hansen use a 5 dB exchange rate, which is used in the US, rather than the 3 dB exchange which is used in Ontario. This difference also affects the appropriateness of the 3 dBA vs 5 dBA excursion above background. (The exchange rate, or doubling rate, refers to the method used for determining the acceptability of varying noise levels. It is the amount by which the permitted sound level may increase if the exposure time is halved.)
- It is common to use an action level that is 50% of the limit. With a 3 dB exchange rate, exposure to 69 dBA would be permitted for half the time permitted with a sound level of 66 dBA, so 66 dBA is appropriate as an action level representing 50% of a 69 dBA limit.

- Metrolinx has stated that its noise monitoring equipment is equipped with devices to allow determination of whether construction is the source of noise levels. ECOH recognizes that levels of 66 dBA may result from sources other than construction, but Metrolinx will be able to determine from this technology whether construction is the source.
- Section 4.1.3 of the Metrolinx plan identifies a number of remedial actions that could be taken if warning or action levels are exceeded. If these measures are available, they should be implemented before the limit is reached.

2.5 Location of Outdoor Noise Monitors

In response to ECOH's recommendations about locating noise monitors near the kindergarten playground on Langley Avenue, the Metrolinx memo states that if the kindergarten playground is in use during construction activity on Langley Avenue, then an additional noise monitor can be installed to address construction noise impacts. ECOH considers this to be acceptable, assuming that remedial action will be taken if sound levels at the kindergarten playground exceed action levels.

3. COMMENTS ON ECOH'S NOISE SURVEYS

3.1 Use of dBC For Measuring Peak Noise Levels

Metrolinx states that ECOH was incorrect in using the C-weighted decibel scale (dBC) for measuring peak noise levels. Use of dBC for measuring peak noise is common in a variety of jurisdictions. There is no standard for peak noise levels in the Ontario Noise Regulation, but a number of Canadian and other jurisdictions require that peak noise levels be measured on the C-weighted scale. For example, the British Columbia Occupational Health and Safety Regulation, Section 7.2 sets a peak noise exposure limit of 140 dB(C). The Toronto Noise Bylaw sets permissible noise levels for noise measured in both dBA and dBC. In any case, ECOH believes these points to be moot, as there is no disagreement about the peak noise limits set by Metrolinx in its plan.

3.2 Calibration Certificates and Technical Details of ECOH's Noise Measurements

The Metrolinx memo says of the ECOH report that "calibration certificates for the noise monitors are not provided for review" and provides a number of other comments about the technical information in the ECOH noise reports. ECOH has provided calibration certificates to TDSB. ECOH used calibrated sound level meters appropriate to the purposes of the noise surveys. The level of technical detail ECOH provided in its reports is comparable to that of the memos provided by Metrolinx, e.g. in its April 6 report of noise measurements.

3.3 Intent of ECOH's Noise Monitoring

Metrolinx critiques ECOH's monitoring on the basis that it entailed short term measurements rather than the long term monitoring conducted by Metrolinx. This indicates a misunderstanding of the intent of ECOH's monitoring. ECOH was not attempting to perform the scale of monitoring conducted by Metrolinx, i.e. long-term monitoring using fixed, sheltered monitors. As this is being conducted by Metrolinx, it was considered inefficient and redundant for ECOH to replicate these methods. Rather, the intent was as follows:

- Monitoring conducted on May 4, 2023 (May 18 report), was intended to provide information on baseline noise levels (with no construction activity) under a variety of representative conditions and from different non-construction sources such as talking, playground activities and traffic. ECOH's observations during short term measurements allow a more detailed understanding of different sources than would long term monitoring by unstaffed sound level meters. The monitoring also served to affirm that Metrolinx' own baseline monitoring results were consistent with ECOH's findings.
- For monitoring conducted on June 7, 2023 (June 20 report), the intent was to assess noise levels from a specific construction source, i.e. a hydrovac machine. Metrolinx' criticism that this report was based on short term measurements is especially inappropriate, as the hydrovac machine did not start operating until after 12 noon, when it was scheduled to start at 9 a.m. In addition to providing information on noise levels resulting from hydrovac operations, ECOH's measurements and observations were of value in demonstrating the effectiveness of the noise barrier in reducing sound levels at the school site and noting the incorrect installation of one of the sound barriers.

4. VIBRATION

The Metrolinx memo states, "ECOH notes that the action levels that will trigger further mitigation should be specified. Metrolinx confirms that these are to be set to the Built Heritage Structure limits in Table 4-2 of the H&S Plan." As with noise, ECOH notes that action levels should be set at values **below** the limit, so that remedial action can be taken before the limit is reached.

ECOH agrees that assessments of the condition of asbestos-containing materials at PAJPS should be conducted prior to, during and after construction activities. ECOH also notes that Metrolinx has agreed to provide vibration logs to the CLC.

5. AIR QUALITY

5.1 24-hour Criteria

Metrolinx rejects ECOH's recommendation that the Ontario Ambient Air Quality Criteria (AAQC) 24-hour values be used as the limits on average particulate (PM_{10} and $PM_{2.5}$) concentrations during the school day. ECOH adheres to our recommendation, especially in light of the World Health Organization's recent lowering of guidelines for PM_{10} and $PM_{2.5}$ and the greater vulnerability of children to air pollutants. Applying a limit based on air monitoring results while construction is

under way would allow a better assessment of the contribution of construction activities to airborne particulate levels.

5.2 Standards for Indoor Particulates

Metrolinx rejects ECOH's recommendation that a criterion be set for indoor concentrations of $PM_{2.5}$, in addition to their standards for PM_{10}. In explaining their rationale, Metrolinx provides arguments for why PM_{10} is a better indicator of particulate from construction activities. ECOH notes that if this is the case, it is not clear why Metrolinx has adopted a standard for $PM_{2.5}$ in outdoor air, as confounders would apply outdoors as well as indoors.

Metrolinx also states "Airborne $PM_{2.5}$ is a component of airborne PM_{10} and is captured when measuring for PM_{10}." This is true but meaningless. $PM_{2.5}$ is more hazardous than PM_{10} because smaller particles reach deeper parts of the lung. Therefore, while the mass contribution of $PM_{2.5}$ to a particulate concentration measurement may be small, the smaller particles are more potent in terms of health effects, and should be measured separately. It is true that there may be non-construction sources of $PM_{2.5}$ in the schools, but this is more likely to be true outdoors where Metrolinx agrees that $PM_{2.5}$ should be measured.

5.3 Monitoring Reports and Warning Levels

ECOH notes that Metrolinx agrees to provide monitoring reports to TDSB. It is also noted that Metrolinx establishes "warning" levels for particulate at 70% of the limit. It is noteworthy that in this case Metrolinx recognizes that warning (action) levels should be less than the limit, although it does not do so for noise and vibration.

6. TRAFFIC AND PEDESTRIAN SAFETY

In response to ECOH's comments, Metrolinx provides additional details on traffic safety, tree removal and meetings with TDSB. These should be incorporated into the Health and Safety Plan.

7. CLOSURE

ECOH would be pleased to provide TDSB with any clarification related to these comments. Should you have any questions, please do not hesitate to contact the undersigned.

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