

# Noise Impact Study – Wellington Hotel, 192 Main Street, Wellington, Ontario



October 6, 2021

Prepared for:  
EcoVue Consulting Services Inc.

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## VERSION CONTROL

Revision	Date	Revision Description	Prepared By:	Submitted To:
Version 1.0	October 6, 2021	Noise Impact Study	Cambium Inc.	EcoVue Consulting Services Inc.



## EXECUTIVE SUMMARY

Cambium Inc. has been retained by EcoVue Consulting Services Inc. in response to a request by the County of Prince Edward to complete a noise impact study of the proposed Wellington Hotel located at 192 Main Street in Wellington, Ontario. The development involves the renovation and restoration of an existing 3-storey hotel building, proposed outdoor gathering area, cabin rentals, and storage buildings.

Cambium's understanding is that County of Prince Edward is concerned with the potential compatibility of the Site with nearby traffic noise, stationary noise sources, and the potential impact of the proposed development onto the surroundings. Cambium has also screened other potential noise sources in the area and has not identified any significant industrial or commercial facilities near the site based upon Provincial guidelines. In addition to the impacts of the environment onto the proposed development, Cambium has also conducted a feasibility level assessment of the proposed development's impacts onto the surrounding area.

Construction noise is generally exempt from most provincial noise guidelines, and is largely constrained by municipal noise by-laws.

Cambium has assessed the impacts from local road traffic on the proposed development following applicable guidelines, including those in *NPC-300 Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning* (NPC-300) (MOECC, 2017). Cambium has assessed in detail the potential noise from Wellington Main Street. The results of the measured and calculated noise impacts were compared against applicable guidelines to assess the potential impact to noise sensitive commercial uses, and to determine the potentially required mitigation measures and warning clauses for the proposed development.

The results of this Noise Impact Study indicate the proposed development is feasible with respect to noise under the defined conditions, assumptions, and recommendations within. No specific noise control measures are required and typical Ontario Building Code facade constructions should be generally sufficient to achieve the indoor sound level criteria.



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## 1.0 INTRODUCTION AND SITE DESCRIPTION

Cambium Inc. has been retained by EcoVue Consulting Services Inc. in response to a request by the County of Prince Edward to complete a noise impact study of the proposed Wellington Hotel located at 192 Main Street in Wellington, Ontario. The development involves the renovation and restoration of an existing 3-storey hotel building, proposed outdoor gathering area, cabin rentals, and storage buildings.

Cambium's understanding is that County of Prince Edward is concerned with the potential compatibility of the Site with nearby traffic noise, stationary noise sources, and the potential impact of the proposed development onto the surroundings. Cambium has assessed in detail the potential noise from traffic on Wellington Main Street. Cambium has also screened other potential noise sources in the area and has not identified any significant industrial or commercial facilities near the site based upon NPC-300 (MOECC, 2017) guidelines. In addition to the impacts of the environment onto the proposed development, Cambium has also conducted a feasibility level assessment of the proposed developments impacts onto the surrounding area.

An evaluation of railway impacts was not required as the proposed development exceeds the 75 metre vibration, and 300 metre noise influence distance published by the Rail Authorities (RAC and FCM, 2013).

Airport noise is not a concern at this location as the nearest airport is more than 15 km away. As such, the site will be well outside any Noise Exposure Contours.



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## 1.1 SITE DESCRIPTION

The proposed commercial development with noise sensitive commercial uses is located at 192 Main Street in Wellington, Ontario. The development involves the renovation and restoration of an existing 3-storey hotel building, proposed outdoor gathering area, cabin rentals, and storage buildings. The proposed cabin rentals consist of six, 1-bedroom rental cabins, and a single 2-bedroom rental cabin.

The outdoor dining and gathering area is located to the west of the existing 3-storey brick building. There are two proposed storage buildings located to the northeast of the existing dwelling. In addition, an annex is located on the east side of the property.

Access to the property will be located off Main Street, and parking will be provided to the north and east of the existing 3-storey dwelling.

The Site is in an urban area as defined by NPC-300 (MOECC, 2017), surrounded by existing residential housing, nearby commercial developments, and arterial roadways in generally close proximity. There is a small existing commercial building located to the southeast of the proposed development. This small commercial space consists of a pizzeria, ice cream shop, and unoccupied or seasonal units.

The general site location is shown in Figure 1 and Figure 2 provides a site plan showing nearby transportation and stationary noise sources near the site.



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## 2.0 IMPACT OF THE ENVIRONMENT ON THE PROPOSED DEVELOPMENT

Cambium has completed an assessment of the potential for noise impacts onto the proposed development from the surrounding environment, including road noise and stationary noise sources. Railway and aircraft noise are not concerns at this location due significant setback distances. The MECP has developed a series of environmental considerations and requirements for both industrial land use (noise sources) and sensitive lands. The MECP has issued these D-Series Guidelines to aid in minimizing potential environmental impacts between industrial and sensitive land uses. We have applied these guidelines in determining the recommended influence distances between the Site and nearby industrial land uses.

### 2.1 ASSESSMENT CRITERIA

For land use planning purposes, the noise criteria are provided in NPC-300 (MOECC, 2017). The guideline limits are set for road noise impacts onto a proposed noise sensitive land use, as well as limits for the impacts of stationary noise sources (commercial/industrial operations).

In the case of this proposed developments, the important limits are:

- Sound level limits for road noise impacts onto the proposed facility;
- Sound level limits for Stationary Noise Sources;

An assessment of the existing ambient sound levels due to road traffic in the area is also relevant. The limits for Stationary Noise Sources can be increased in the situation of high ambient sound levels. Specifically, if the ambient noise in an area exceeds the exclusionary limits published in NPC-300 (MOECC, 2017) that ambient noise level may act as the new sound level limit. This only applies to stationary noise sources.

### 2.2 ROAD TRAFFIC NOISE

The criteria for acceptable levels of road traffic noise at noise sensitive commercial uses are provided in NPC-300 (MOECC, 2017). It requires that for land use compatibility, a future sound level be used for assessment. Generally, a 10 year prediction is considered appropriate unless otherwise directed by the municipal authority having jurisdiction.

Noise controls, or warning clauses are not specifically required if predicted sound levels are less than 55 dBA in outdoor living areas, and less than 50 dBA in the plane of bedroom windows during daytime or nighttime.

If the sound level thresholds listed above are exceeded, the recommended outdoor and indoor sound level criteria for road noise impacts for different noise sensitive commercial use impacts are included in Table 1 below. In the case of interior noise limits, these values assume closed windows and doors.





**Embedded Table 1: Outdoor and Indoor Sound Level Limits (Road Noise Criteria)**

Type of Space	07:00 to 23:00	23:00 to 07:00
	Road (dBA)	Road (dBA)
Outdoor Living Area (NPC-300 Table C-1)	55	-
Living/Dining/Den Areas (NPC-300 Table C-2)	45	45
Sleeping Quarters Indoor (NPC-300 Table C-2)	45	40
Sleeping Quarters Indoor Hotel-Motel (NPC-300 Table C-9)	45	45

In NPC-300 (MOECC, 2017), an outdoor living area (OLA) is part of a noise sensitive land use that is intended and designed for the quiet enjoyment of the outdoor environment, and is readily accessible from the building. In the context of noise sensitive commercial uses, the outdoor living area rules require that at least 56 square metres of space (if available) should be compliant with the above limits for road traffic noise.

If the predicted 16-hour equivalent sound level ( $L_{eq(16)}$ ) for an OLA is greater than 55 dBA and less than or equal to 60 dBA, then noise control measures may be applied to reduce the sound level to 55 dBA. If noise control measures are not applied, then prospective purchasers or tenants shall be informed of potential noise concerns by a warning clause (Type A as defined in NPC-300) (MOECC, 2017).

If the Predicted  $L_{eq(16)}$  for an OLA is greater than 60 dBA, then noise control measures shall be applied to reduce the sound level to 55 dBA. In cases where noise control measures are not feasible for technical, economic, or administrative purposes, then an excess above the 55 dBA limit is acceptable with a warning clause (Type B as defined in NPC-300) (MOECC, 2017); though excesses above 60 dBA are not acceptable.

For indoor living areas and sleeping quarters, the sound level criteria is used to determine transmission loss requirements for the building facade based on the predicted sound level at the plane of a window (POW). If the  $L_{eq(16)}$  daytime predicted sound level in the plane of a window is less than or equal to 55 dBA, then typical building code facade constructions are generally sufficient to achieve the indoor sound level criteria, and additional noise controls may not be required. If the predicted sound level at the plane of a window is greater than 55 dBA and less than or equal to 65 dBA, the dwelling shall be designed with a provision for the installation of central air conditioning in the future, at the occupant's discretion. In addition, prospective purchasers or tenants shall be informed of potential noise concerns by a warning clause (Type C as defined in NPC-300) (MOECC, 2017).

If the predicted daytime 16 hour equivalent sound level ( $L_{eq(16)}$ ) in the plane of a window is greater than 65 dBA, installation of central air conditioning shall be implemented, and prospective purchasers or tenants shall be informed of potential noise concerns by a warning clause (Type D as defined in NPC-300) (MOECC, 2017). Additionally,



building facade components shall be designed so that the indoor sound level criterion can be achieved when doors and windows are closed.

In addition, for indoor living areas and sleeping quarters the sound level criteria are used to determine transmission loss requirements for the building facade based on the predicted nighttime sound level at the plane of a window (POW). If the eight hour equivalent ( $L_{eq(8)}$ ) nighttime predicted sound level in the plane of a window is less than or equal to 50 dBA, then typical facade constructions are generally sufficient to achieve the indoor sound level criteria, and additional noise controls may not be required. If the predicted sound level in the plane of a window is greater than 50 dBA and less than or equal to 60 dBA, then the dwelling shall be designed with a provision for the installation of central air conditioning in the future, at the occupant's discretion. The prospective purchasers or tenants shall be informed of potential noise concerns by a warning clause (Type C as defined in NPC-300) (MOECC, 2017).

If the predicted nighttime  $L_{eq(8)}$  in the plane of a window is greater than 60 dBA, installation of central air conditioning shall be implemented, and prospective purchasers or tenants shall be informed of potential noise concerns by a warning clause (Type D as defined in NPC-300) (MOECC, 2017). Additionally, building facade components shall be designed so that the indoor sound level criterion can be achieved when doors and windows are closed. The purpose of central air conditioning is to allow the occupant to keep windows and doors closed to achieve a quiet indoor acoustic environment, if required.

Installation of all residential sized central air conditioning for noise sensitive commercial uses shall comply with ministry guidelines including NPC-216 for residential air conditioning devices. As well as the "Environmental Noise Guidelines for installation of Residential Air Conditions Devices" September 1994.

### **2.2.1 TRAFFIC NOISE ASSESSMENT**

Our noise assessment was conducted using predictive calculations of road and rail noise developed by the Ministry: *Ontario Road Noise Analysis Method for Environment and Transportation* (ORNAMENT) (MOE, 1989).

We evaluated noise impact at the upper storey plane of window receptor locations, and at potential outdoor living areas located at ground level.

Where,

- POW – Plane of window receptors representative of the worst case exposure on each side of the buildings in the proposed development; and
- OLA – Potential outdoor living area receptor located at ground level.

The traffic data used for the road noise assessment is from an average 24-hour traffic volume based upon a week study conducted in July of 2019, and provided by the County of Prince Edward. The provided average 24-hour traffic volume is considered appropriate for this study as it was based upon increased traffic volumes during summer



months. The County of Price Edward did not specify the percentages of medium and heavy trucks. As such, Cambium has assumed a truck percentage of 3 percent, applied as medium (1.5%) and heavy (1.5%). Cambium also used the ORNAMENT (MOE, 1989) recommended day/night split of 90/10 percent for regional roads, which assumes 90 percent of the daily traffic occurs between 07:00 and 23:00.

Appendix A provides traffic data and Appendix B provides ORNAMENT calculations.

## 2.3 STATIONARY NOISE SOURCES

NPC-300 Part C (MOECC, 2017) provides limits for stationary noise source impacts onto proposed residential or commercial developments with noise sensitive commercial uses. Receptors are classified as Class 1, Class 2, Class 3 or Class 4. The definitions of these classifications are:

- Class 1: an area with an acoustical environment typical of a major population centre, where the background sound level is dominated by the activities of people, usually road traffic, often referred to as "urban hum."
- Class 2: an area with an acoustical environment that has qualities representative of both Class 1 and Class 3 areas:
  - Sound levels characteristic of Class 1 during daytime (07:00 to 19:00 or to 23:00); and,
  - Low evening and night background sound level defined by natural environment and infrequent human activity starting as early as 19:00 (19:00 or 23:00 to 07:00).
- Class 3: a rural area with an acoustical environment that is dominated by natural sounds having little or no road traffic, such as:
  - a small community;
  - agricultural area;
  - a rural recreational area such as a cottage or a resort area; or
  - a wilderness area.
- Class 4: an area or specific site that would otherwise be defined as Class 1 or 2 and which:
  - is an area intended for development with new noise sensitive land use(s) that are not yet built;
  - is in proximity to existing, lawfully established stationary source(s); and
  - has formal confirmation from the land use planning authority with the Class 4 area classification which is determined during the land use planning process.
  - Additionally, areas with existing noise sensitive land use(s) cannot be classified as Class 4 areas.



Based on a review of the traffic analysis and observations on site, the proposed development is best described as a Class 2 receptor. The stationary noise source limits for each of the receptor classes are included in the following tables:

**Embedded Table 2: Stationary Noise Criteria Outdoor Living Areas (Proposed Development is Class 2)**

Time of Day	Class 1	Class 2	Class 3	Class 4
	(dBA)	(dBA)	(dBA)	(dBA)
07:00-19:00	50	50	45	55
19:00-23:00	50	45	40	55

**Embedded Table 3: Stationary Noise Criteria Plane of Window (Proposed Development is Class 2)**

Time of Day	Class 1	Class 2	Class 3	Class 4
	(dBA)	(dBA)	(dBA)	(dBA)
07:00-19:00	50	50	45	60
19:00-23:00	50	50	40	60
23:00-07:00	45	45	40	55

These limits are exclusionary for each class and time period under NPC-300 (MOECC, 2017), the higher of either the exclusionary limits, or the current ambient noise levels measured or predicted in accordance with Ministry guidelines in the area shall be used as the sound level limits. The noise impact predictions within this study have been based upon the exclusionary limits, as provided in Table 2 and Table 3.

### **2.3.1 DESCRIPTION OF STATIONARY NOISE SOURCES**

The following relates to the impacts of existing stationary noise sources in the vicinity to the proposed development. NPC-300 (MOECC, 2017) states that a proposed sensitive land use is required to ensure that compliance is maintained for any nearby stationary noise source. Ontario Regulation 524/98 exempts many types of smaller stationary noise sources from approval. Therefore, many nearby businesses may not have approvals in place. An exemption from approval does not mean exemption from noise guidelines so Cambium has reviewed nearby smaller commercial operations, as well as those that have approvals or registrations in place.

Cambium personnel conducted a site visit on July 20, 2021. During the site visit, a noise survey was completed in order to identify all off-site potential sources of noise that should be considered. These include traffic noise, commercial, institutional, and industrial noise sources as applicable.



Based upon a review of access environment, no Air related Environmental Compliance Approvals or Registrations were identified within 1 km of the site. With consideration for the MECP D-series guideline, a review of aerial imagery of Wellington, indicates that there does not appear to be any heavy Class III type industries located within 1 km of the site. Furthermore there were no Class II industries within 300 metres. Within 70 metres of the site however there are existing commercial uses that could potentially be considered Class I industry these include commercial operations to the southeast mainly store fronts and restaurant type businesses. Aside from this adjacency, it is notable that the majority of surrounding land uses are residential and therefore noise sensitive.

The assessment of aerial imagery was confirmed during the site visit, no significant sources of stationary noise have been observed which would be expected to generate a significant noise impact on the proposed development. With the exception of a small HVAC condenser and upblast exhaust fan which were observed on the north side of the local pizzeria to the south of the proposed development. Cambium conducted a sound level measurement of these sources to determine the impact onto the development. It was also confirmed during the site visit that the exhaust fan was fully operational. As such, Cambium has modeled a new representative noise impact scenario based upon on site observations and sound level measurements.

Noise sources included:

- EX01 – This point source represents the small HVAC condenser unit and upblast exhaust fan, modelled at a height of 3 metres. Per Cambium measurements, a sound power level of 67 dBA was used. This source was modeled as active for 100% during daytime hours, and 50% during evening and nighttime hours. Any shielding provided by existing buildings was captured in the noise model.

The supporting calculations and impact results are provided in Appendix C. Based upon the predicted noise impacts and observations made during the site visit, these sources are considered insignificant in comparison to other local noise sources such as traffic noise.

## **2.4 NOISE IMPACT PREDICTIONS**

The following section provides the results of our analysis.

### **2.4.1 NOISE IMPACT PREDICTIONS – OUTDOOR LIVING SPACES**

Road traffic noise must be assessed using potential future traffic conditions. The south side of the development, closest to Main Street, is assumed to be the worst case location of the OLA as per the preliminary site plan. As noted in Section 2.1, the predicted impacts at the OLA due to road traffic that are less than 55 dBA would not require noise controls, levels between 55 dBA and 60 dBA would require either noise controls or warning clauses. Sound levels above 60 dBA would require noise controls in addition to warning clauses.



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Based on the noise impact calculations completed using STAMSON software, the noise impact from Wellington Main Street is expected to be less than 55 dBA for all outdoor living area receptor locations provided in the amended Figure 1. As such, warning clauses or noise mitigation are not required.

#### **2.4.2 NOISE IMPACT PREDICTIONS – BUILDING FAÇADE**

As noted in Section 3.2, the sound level limits for the windows of noise sensitive land uses are 55 dBA at the window during daytime hours (07:00-23:00) and 50 dBA during nighttime hours (23:00-07:00) for typical building construction and without warning clauses.

If the predicted daytime sound level at the plane of a window is greater than 55 dBA and less than or equal to 65 dBA, the dwelling shall be designed with a provision for the installation of central air conditioning in the future, at the occupant's discretion. In addition, prospective purchasers or tenants shall be informed of potential noise concerns by a warning clause (Type C as defined in NPC-300) (MOECC, 2017).

If the predicted nighttime sound level in the plane of a window is greater than 50 dBA and less than or equal to 60 dBA, then the dwelling shall be designed with a provision for the installation of central air conditioning in the future, at the occupant's discretion. The prospective purchasers or tenants shall be informed of potential noise concerns by a warning clause (Type C as defined in NPC-300) (MOECC, 2017).

The noise impacts from Main Street were calculated at the nearest noise sensitive building façades. The results are then compared to the applicable limits and used to recommend building façade requirements if required. The proposed location of the Annex was not calculated, as the setback distance from Main Street is significantly greater than the selected nearest noise sensitive dwellings.

The results of Cambium's analysis are summarized in appended Table 4 and Table 5. Noise impacts due to road traffic noise at the proposed noise sensitive building façades (POR01 to POR02) are predicted to be less than 55 dBA during daytime hours, and less than 50 dBA during nighttime hours. As such, warning clauses or noise mitigation are not required.



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### 3.0 IMPACT OF THE PROPOSED DEVELOPMENT ON THE ENVIRONMENT

The development is in the preliminary design stages, thus detailed mechanical designs have not been produced. Therefore, this assessment is included as a feasibility check to confirm that the facility is likely capable of complying with NPC-300 at the nearby sensitive receptors.

The expected noise sources on site would typically include heating, ventilation, and air conditioning equipment installed at the development. The proposed detached cabin dwellings and units will likely only include residential air conditioning units, and therefore will be required to comply with Ministry publication *NPC-216 Residential Air Conditioning Devices* (NPC-216) (Ontario Ministry of Environment and Energy, 1993) and the *Environmental Noise Guidelines for Installation of Residential Air Conditioning Devices* (Ontario Ministry of Environment and Energy, 1994). The proposed development will also not result in a significant increase of road traffic in the area.

It is Cambium's understanding that a kitchen and bar will be located in the existing 3-storey brick building that is currently undergoing renovation. The kitchen and bar will be located on the north side of the building. As the development is in preliminary design stages, detailed mechanical designs or equipment selections have not been produced. As such, Cambium has conducted noise modelling with a source that best represents the potential kitchen exhaust system for the proposed kitchen and a summary is provided below.

- EX-02 – This point source represents the potential ventilation exhaust for the proposed kitchen. A sound power level of 73 dBA was used. This source was modeled as active for 100% during daytime hours, and 50% during evening and nighttime hours. Any shielding provided by existing buildings was captured in the noise model.

The supporting calculations and impact results are provided in Appendix D. Based upon the predicted noise impacts and observations made during the site visit, these potential sources do not exceed the applicable limits for stationary noise sources.

Cambium has also made considerations for potential outdoor activities such as amplified music. It is our understanding that an outdoor seating area will be located directly west of the existing 3 storey brick building. As discussed in Section 4.1, the Prince Edward By-law 3908-2016 states that noise should not exceed 60 dB before 7:00 a.m. and after 11:00 p.m. in a residential zone. The nearest residential dwelling is located approximately 130 metres to the southwest of this outdoor seating area with the potential for amplified music.

To satisfy the requirements of the noise by-law, Cambium recommends that if outdoor amplified music occurs on site, the overall sound level from all emitting sources such as speakers should be limited to 90 dBA at a distance of 3 metres before 7:00 a.m. and after 11:00 p.m. Again, this source was not included in NPC-300 analysis since it is not considered a noise source under NPC-300, noise sources such as this are anticipated by NPC-300 to be dealt with via local noise bylaws. Cambium would recommend that compliance with the noise bylaw, if amplified music is anticipated to be used outside of 7:00 am to 11:00 pm, could be achieved by the venue purchasing its own sound



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level meter to confirm compliance with the sound levels noted above; Or if the venue intends to install a permanent sound system, there are noise limiters commercially available that can be used to ensure a sound system does not exceed a given sound level.

Cambium would note that with regard to sound limiters there are operational realities that will have to be considered. Cambium's understanding of sound limiters is that they must be calibrated based on the venue and the sound system equipment being used.

If the venue does not intend to purchase their own sound system, meaning that amplified sound systems will be provided via rental, or provided by a third party for the given event. This may create number of difficulties related to compatibility of the sound limiter to whichever sound system is being utilized, as well as difficulties related to calibration of the sound limiter with the potentially variable sound systems.

Therefore, Cambium would propose that a sound limiter system recommendation be included, however that it be conditional on being technically feasible. If it is not technically feasible, then the venue should be required to maintain a sound level meter on site to confirm compliance with the local noise bylaw. Assuming they wish to operate the sound system outside of the uncontrolled 7:00 am to 11:00 pm time period in the bylaw.





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## 4.0 CONSTRUCTION ACTIVITIES

Typical construction activities are exempt from provincial noise guidelines related to land use compatibility. We have summarized the local bylaws relating to construction noise here, as well as good practice considerations for construction vibration.

### 4.1 LOCAL NOISE BYLAW

Typically construction activities are not included in noise studies as they are usually exempt from guidelines. Despite this the Ministry and the Municipality both have guidelines and by-laws that may apply as follows:

- The Corporation of the County of Prince Edward By-law 3908-2016 will apply to the site, unless a specific exemption has been obtained. The bylaw adds the following new clause as No.4, and renumber the balance of the by-law sections accordingly: “Section 4: No person shall cause or permit noise arising out of or created by construction or construction equipment before 7:00 a.m. and after 7:00 p.m.”.
- The Corporation of the County of Prince Edward By-law 2819-2011 will also apply to the site, unless a specific exemption has been obtained. Section 2 provides an amendment to subsection a. in By-law 900-2002. “No person shall make, cause or permit noise or vibrations so as to be heard or felt or otherwise perceived outside the property in excess of the normal business practice upon which any manufacture or trade is carried on and which are, in the view of all the circumstances including the nature of the neighbourhood and the use to which adjoining properties are put and the time of day during which such noise or vibrations are made, caused or created excessive or which are, or may cause a nuisance to the public generally or to others residing or carrying on a manufacture, trade or business in the vicinity, and
  - i) Exceeding 60 dB before 7:00 a.m. and after 11:00 p.m. in a residential zone; or
  - ii) Exceeding 60 dB before 7:00 a.m. and after 2:00 a.m. in all other zones”

Section 3 also provides an amendment to Section 3 in By-law 900-2002 in its entirety and replaces it with, “ No person shall ring any bell, blow or sound any horn or cause the same to be rung, blown, or sounded, shout or crate, cause or permit any unusual noise or noises:

- a) Exceeding 60 dB before 7:00 a.m. and after 11: 00 p.m. in a residential zone; or
  - b) Exceeding 60 dB before 07:00 a.m. and after 2:00 a.m. in all other zones”
- Any construction equipment used on site shall comply with Ministry guideline NPC-115 “Noise Due to Construction Equipment”, which provides specific sound level requirements for construction equipment. Most modern construction equipment will meet this requirement provided mufflers are maintained. Therefore Cambium would recommend that only in the event of complaints, the sound levels of the equipment could be confirmed.



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## 5.0 RECOMMENDATIONS

In summary Cambium has made the following recommendations:

- Any heating, ventilation, and air conditioning equipment installed at the development is recommended to comply with NPC-216 and the Environmental Noise Guidelines for Installation of Residential Air Conditioning Devices.
- Construction activity may not occur outside of 07:00 to 19:00, as per the noise by-law; and.
- If outdoor gathering, dining, or bar areas contain amplified music, sound level limits should be satisfied as per noise by-law 2819-2011 specifically from 11:00 pm to 7:00 am. The by-law provides overall sound level limits in dB, however Cambium assumes this to be dBA (A-weighted). This could be achieved by either a permanent sound limiter on a permanent sound system, or the use of a sound level meter by the venue to confirm compliance of variable sound systems as described in this report.



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## 6.0 CONCLUSIONS

Cambium Inc. has been retained by the EcoVue response to a request by the County of Prince Edward, to complete a Noise Impact Study for the proposed Wellington Hotel in Wellington, Ontario.

This report was prepared to support the proposed site design and feasibility. The contents of this report, including its analysis, shall be reviewed during the final design to ensure any alterations made will not affect compliance.

Based on the terms and the information provided to Cambium, it is our opinion that the proposed Wellington Hotel is feasible from a noise perspective.

Respectfully submitted,

**Cambium Inc.**

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Trevor Ross, EIT  
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## 7.0 REFERENCES

- MOE. (1989). *ORNAMENT Ontario Road Noise Analysis Method for Environment and Transportation*. Ontario Ministry of the Environment.
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## Appended Figures

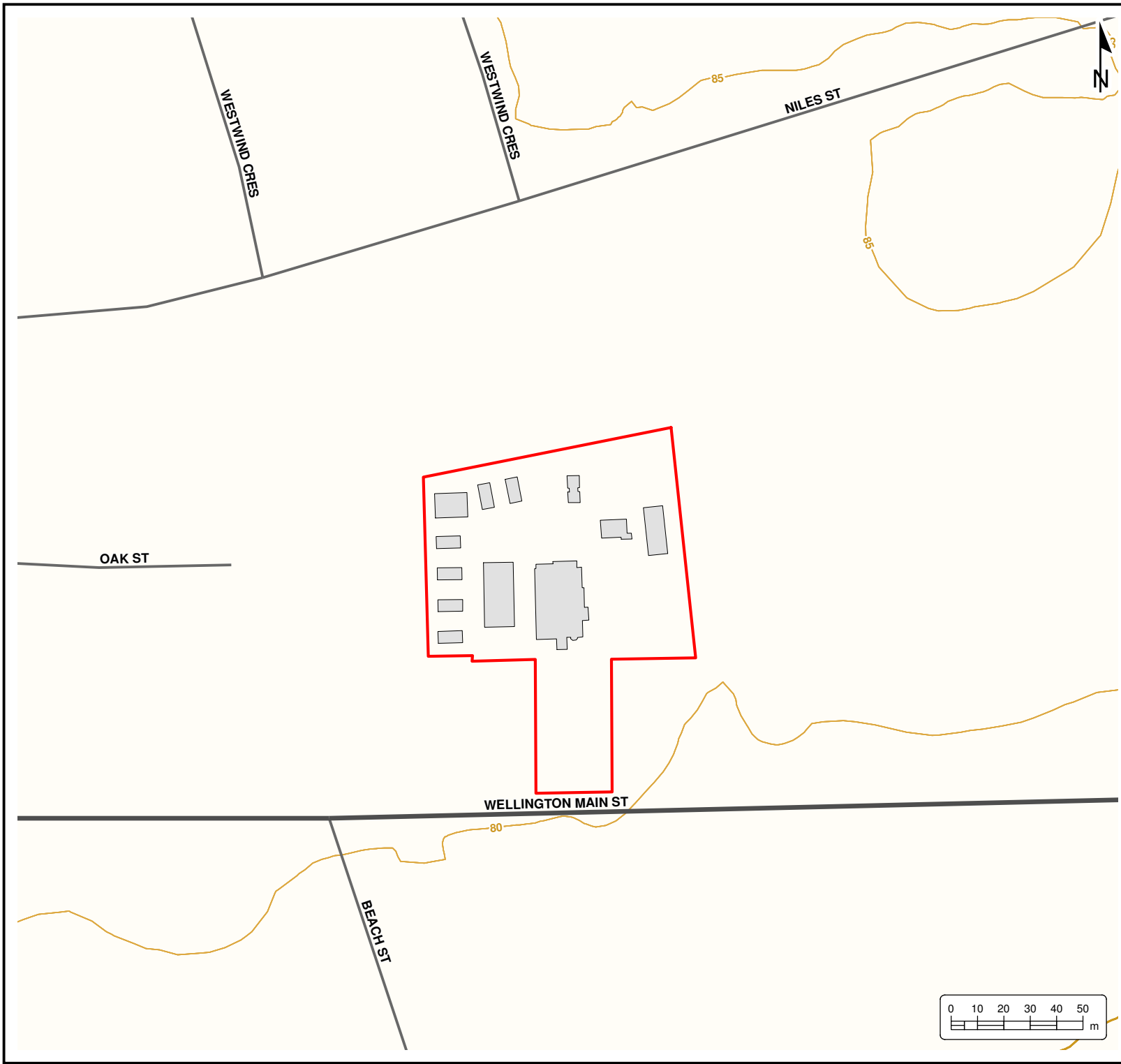
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**Figure 1 Site Location Map**

**Figure 2 Site Plan**

**Figure 3 Land Use Zoning Map**









## NOISE IMPACT STUDY

ECOVUE

192 Wellington Street  
Newtonville, Ontario

### LEGEND

-  Major Road
-  Minor Road
-  Contour 5m Interval (Major)
-  Contour 5m Interval (Minor)
-  Building
-  Site (approximate)

**Notes:**

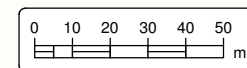
- Base mapping features are © Queen's Printer of Ontario, 2019 (this does not constitute an endorsement by the Ministry of Natural Resources or the Ontario Government).
- Distances on this plan are in metres and can be converted to feet by dividing by 0.3048.
- Cambium Inc. makes every effort to ensure this map is free from errors but cannot be held responsible for any damages due to error or omissions. This map should not be used for navigation or legal purposes. It is intended for general reference use only.



194 Sophia Street  
Peterborough, Ontario, K9H 1E5  
Tel: (705) 742.7900 Fax: (705) 742.7907  
www.cambium-inc.com

### SITE LOCATION PLAN

Project No.:	13371-001	Date:	September 2021
Scale:	1:2,000	Rev.:	
Created by:	TLC	Checked by:	JWS
		Figure:	<b>1</b>



# NOISE IMPACT STUDY

ECOVUE  
192 Wellington Street  
Newtonville, Ontario

## LEGEND

- Receptor
- Building
- Site (approximate)

**Notes:**

- Base mapping features are © Queen's Printer of Ontario, 2019 (this does not constitute an endorsement by the Ministry of Natural Resources or the Ontario Government).  
 - Distances on this plan are in metres and can be converted to feet by dividing by 0.3048.  
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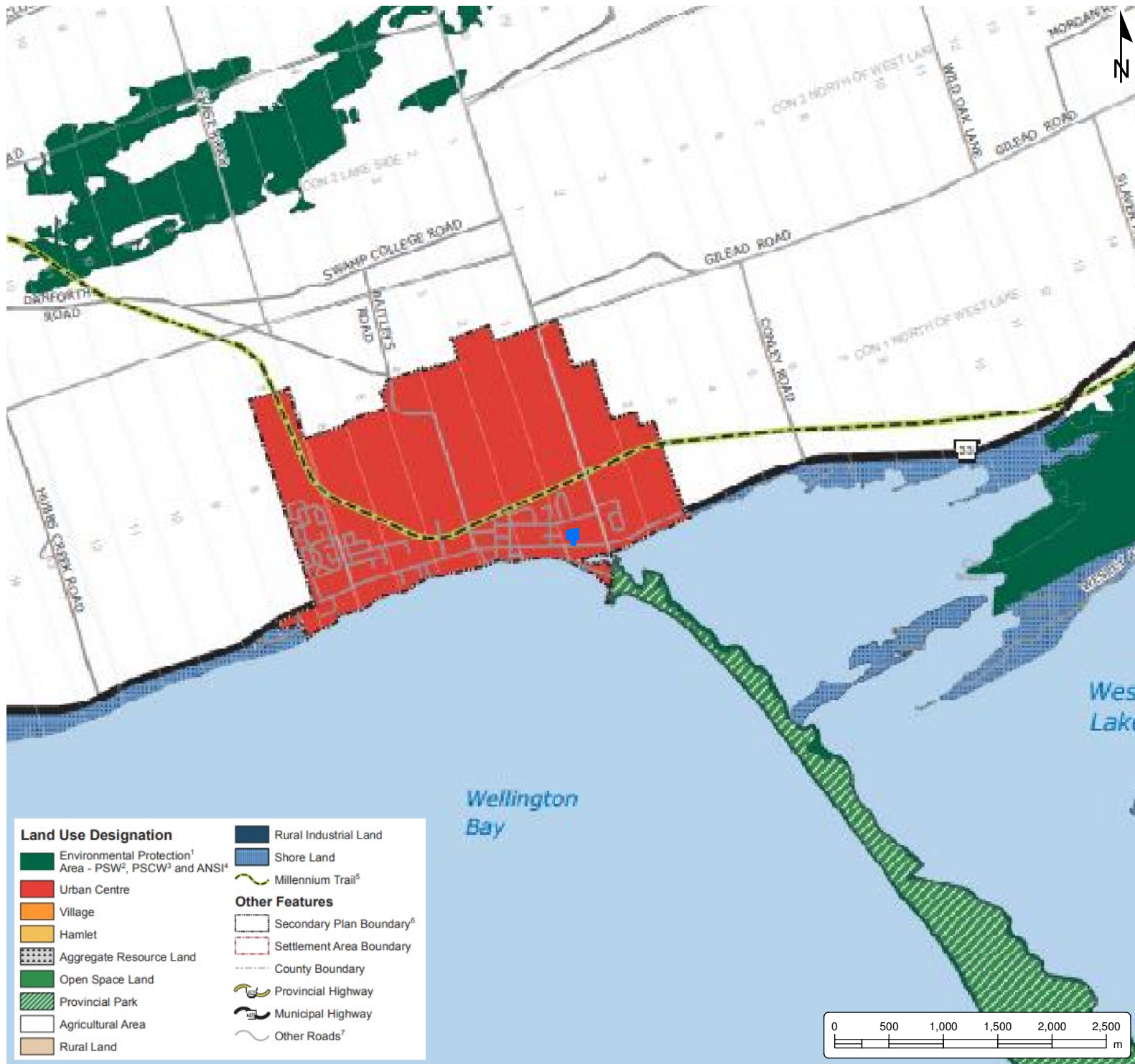
## SITE PLAN

Project No.:	13371-001	Date:	September 2021
Scale:	1:1,000	Rev.:	
Created by:	TLC	Checked by:	JWS
		Figure:	<b>2</b>





O:\GIS\MXDs\13000-13999\1371-001 EcoVue - Wellington Hotel - 192 Wellington Main Street\2021-09-24 FIG 3 - Land Use Zoning Plan.mxd



Land Use Designation	
	Environmental Protection <sup>1</sup>
	Area - PSW <sup>2</sup> , PSCW <sup>3</sup> and ANSI <sup>4</sup>
	Urban Centre
	Village
	Hamlet
	Aggregate Resource Land
	Open Space Land
	Provincial Park
	Agricultural Area
	Rural Land
	Rural Industrial Land
	Shore Land
	Millennium Trail <sup>5</sup>
Other Features	
	Secondary Plan Boundary <sup>6</sup>
	Settlement Area Boundary
	County Boundary
	Provincial Highway
	Municipal Highway
	Other Roads <sup>7</sup>

## NOISE IMPACT STUDY

ECOVUE  
192 Wellington Street  
Newtonville, Ontario

### LEGEND

Site (approximate)

**Notes:**  
 - Land Use Zoning was obtained from the Prince Edward County Official Plan, Schedule "A-3" Land Use Designations, Dated February 18, 2021.  
 - Distances on this plan are in metres and can be converted to feet by dividing by 0.3048.  
 - Cambium Inc. makes every effort to ensure this map is free from errors but cannot be held responsible for any damages due to error or omissions. This map should not be used for navigation or legal purposes. It is intended for general reference use only.



194 Sophia Street  
Peterborough, Ontario, K9H 1E5  
Tel: (705) 742.7900 Fax: (705) 742.7907  
www.cambium-inc.com

## LAND USE ZONING PLAN

Project No.:	13371-001	Date:	September 2021
Scale:	1:50,000	Rev.:	
Created by:	TLC	Projection:	NAD 1983 UTM Zone 18N
Checked by:	JWS	Figure:	<b>3</b>



---

## Appended Tables

---



---

**Table 4 Traffic Noise Results Summary**

**Table 5 Results Summary**



**Table 4 - Traffic Noise Results Summary**

Source	Ref. Forecasted 24-Hour Traffic Volume <sup>1</sup>	Traffic Breakdown, (Day/Night) <sup>2</sup>			Receptor	Notes	Impact due to background traffic (dBA) <sup>3</sup>	
		Cars	Med. Trucks	Heavy Trucks			Day	Night
Main Street (Regional Road 33)	6723	7290/810	192/21	192/21	POR01 - 65 m from Main St., South	4.5 m Height	52.7	46.1
Main Street (Regional Road 33)	6723	7290/810	192/21	192/21	POR02 - 68 m from Main St., South	4.5 m Height	51.7	45.1
Main Street (Regional Road 33)	6723	7290/810	192/21	192/21	POR01_OLA - 55 m from Main St., South	1.5 m Height	52.6	46.0
Main Street (Regional Road 33)	6723	7290/810	192/21	192/21	POR02_OLA - 60 m from Main St., South	1.5 m Height	51.9	45.4

1 - 24-Hour Traffic Volume from County of Prince Edward expanded to 10 years future at 2% growth per year

2 - 90% day-night split from Ministry ORNAMENT, Percentage trucks assumed.



**Table 5 - Combined Traffic Noise Results Summary and Noise Controls**

Receptor	Description	Noise Impact (dBA, Leq)			
		07:00 to 23:00		23:00 to 07:00	
		Road	Controls	Road	Controls
POR01	South Facing Façade	52.7	None/OBC	46.1	None/OBC
POR1_OLA	South Facing OLA	52.6	None/OBC	46.0	None/OBC
POR02	South Facing Façade	51.7	None/OBC	45.1	None/OBC
POR02_OLA	South Facing OLA	51.9	None/OBC	45.4	None/OBC

Notes

WC - Warning Clause

Implement AC - ensure central air conditioning is installed

Design AC - Ensure it is possible for tenant to upgrade to central air conditioning in future

STC - indicates windows and walls should be acoustically designed to meet indoor noise targets Per NPC-300

OBC - Ontario building code standard construction should be satisfactory



---

## **Appendix A**

# **Road Traffic Data Requests**

---

## Trevor Copeland

---

**From:** James Griffin <jgriffin@pecounty.on.ca>  
**Sent:** July-20-21 11:38 AM  
**To:** James Sellars  
**Cc:** Aynsley Osborne  
**Subject:** RE: Traffic Data - Noise Impact Study

Good morning James,

Unfortunately, we don't have a lot of urban counts. These are the only counts we have for Wellington Main Street:

COUNTY ROADS	DESCRIPTION	TRAFFIC VOLUME (24h)	POSTED SPEED	Date of Counts
WELLINGTON MAIN STREET	250 Wellington Main Street (week of counts conducted)	6723	50	July 18, 201

If you have any questions please do not hesitate to ask.

James

---

**From:** James Sellars <James.Sellars@cambium-inc.com>  
**Sent:** July 20, 2021 9:54 AM  
**To:** James Griffin <jgriffin@pecounty.on.ca>  
**Subject:** Traffic Data - Noise Impact Study

**CAUTION:** This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi James,

Further to my voicemail, we're currently conducting a noise impact study and would like to request the most recent AADT counts for Wellington Main Street, near the intersection of Belleville Street. I've also attached a screenshot of the location.

Thanks for the time and assistance.

James



**James Sellars**  
Project Coordinator

**Cambium Inc. - Oshawa**

Environmental | Building Sciences | Geotechnical | Construction Monitoring  
p: 905.725.6280 | c: 905.259.8947 | toll: 866.217.7900 | w: [cambium-inc.com](http://cambium-inc.com)

Under modified work conditions in response to the current pandemic and government directives, Cambium continues to provide the professional services you have come to expect to guide good decisions. The well-being and safety of our teams, clients, and communities are a top priority. We ask for your patience and look forward to working together as we evolve into the "new normal". Stay safe. Better days are ahead.

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Check out our [video](#) - an inside look at Cambium's culture & career opportunities.





---

## **Appendix B**

### **STAMSON Calculations**

---

Filename: POR020LA.te          Time Period: Day/Night 16/8 hours  
 Description:

Road data, segment # 1: Main Street (day/night)

-----  
 Car traffic volume : 7290/810    veh/TimePeriod \*  
 Medium truck volume : 192/21    veh/TimePeriod \*  
 Heavy truck volume : 192/21    veh/TimePeriod \*  
 Posted speed limit : 50 km/h  
 Road gradient : 0 %  
 Road pavement : 1 (Typical asphalt or concrete)

\* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 6723  
 Percentage of Annual Growth : 2.00  
 Number of Years of Growth : 12.00  
 Medium Truck % of Total Volume : 2.50  
 Heavy Truck % of Total Volume : 2.50  
 Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Main Street (day/night)

-----  
 Angle1 Angle2 : -80.00 deg 80.00 deg  
 Wood depth : 0 (No woods.)  
 No of house rows : 0 / 0  
 Surface : 1 (Absorptive ground surface)  
 Receiver source distance : 60.00 / 60.00 m  
 Receiver height : 1.50 / 1.50 m  
 Topography : 1 (Flat/gentle slope; no barrier)  
 Reference angle : 0.00

↑  
 Results segment # 1: Main Street (day)

-----  
 Source height = 1.26 m

ROAD (0.00 + 51.93 + 0.00) = 51.93 dBA  
 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq  
 -----  
 -80 80 0.66 63.51 0.00 -9.99 -1.59 0.00 0.00 0.00 51.93  
 -----

Segment Leq : 51.93 dBA

Total Leq All Segments: 51.93 dBA

↑  
 Results segment # 1: Main Street (night)

-----  
 Source height = 1.25 m

ROAD (0.00 + 45.35 + 0.00) = 45.35 dBA  
 Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq  
 -----  
 -80 80 0.66 56.93 0.00 -9.99 -1.59 0.00 0.00 0.00 45.35  
 -----

Segment Leq : 45.35 dBA

Total Leq All Segments: 45.35 dBA

↑

Cambium Inc.

TOTAL Leq FROM ALL SOURCES (DAY): 51.93  
(NIGHT): 45.35

↑  
↑

Filename: POR02.te                  Time Period: Day/Night 16/8 hours  
 Description:

Road data, segment # 1: Main Street (day/night)

-----  
 Car traffic volume : 7290/810    veh/TimePeriod \*  
 Medium truck volume : 192/21    veh/TimePeriod \*  
 Heavy truck volume : 192/21    veh/TimePeriod \*  
 Posted speed limit : 50 km/h  
 Road gradient : 0 %  
 Road pavement : 1 (Typical asphalt or concrete)

\* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 6723  
 Percentage of Annual Growth : 2.00  
 Number of Years of Growth : 12.00  
 Medium Truck % of Total Volume : 2.50  
 Heavy Truck % of Total Volume : 2.50  
 Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Main Street (day/night)

-----  
 Angle1 Angle2 : -80.00 deg 80.00 deg  
 Wood depth : 0 (No woods.)  
 No of house rows : 0 / 0  
 Surface : 1 (Absorptive ground surface)  
 Receiver source distance : 68.00 / 68.00 m  
 Receiver height : 4.50 / 4.50 m  
 Topography : 1 (Flat/gentle slope; no barrier)  
 Reference angle : 0.00

↑  
 Results segment # 1: Main Street (day)

-----  
 Source height = 1.26 m

ROAD (0.00 + 51.69 + 0.00) = 51.69 dBA  

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-80	80	0.58	63.51	0.00	-10.35	-1.47	0.00	0.00	0.00	51.69

 -----

Segment Leq : 51.69 dBA

Total Leq All Segments: 51.69 dBA

↑  
 Results segment # 1: Main Street (night)

-----  
 Source height = 1.25 m

ROAD (0.00 + 45.11 + 0.00) = 45.11 dBA  

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-80	80	0.58	56.93	0.00	-10.35	-1.47	0.00	0.00	0.00	45.11

 -----

Segment Leq : 45.11 dBA

Total Leq All Segments: 45.11 dBA

↑

Cambium Inc.

TOTAL Leq FROM ALL SOURCES (DAY): 51.69  
(NIGHT): 45.11

↑  
↑

Filename: POR10LA.te            Time Period: Day/Night 16/8 hours  
 Description:

Road data, segment # 1: Main Street (day/night)

-----  
 Car traffic volume : 7290/810    veh/TimePeriod \*  
 Medium truck volume : 192/21    veh/TimePeriod \*  
 Heavy truck volume : 192/21    veh/TimePeriod \*  
 Posted speed limit : 50 km/h  
 Road gradient : 0 %  
 Road pavement : 1 (Typical asphalt or concrete)

\* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 6723  
 Percentage of Annual Growth : 2.00  
 Number of Years of Growth : 12.00  
 Medium Truck % of Total Volume : 2.50  
 Heavy Truck % of Total Volume : 2.50  
 Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Main Street (day/night)

-----  
 Angle1 Angle2 : -80.00 deg 80.00 deg  
 Wood depth : 0 (No woods.)  
 No of house rows : 0 / 0  
 Surface : 1 (Absorptive ground surface)  
 Receiver source distance : 55.00 / 55.00 m  
 Receiver height : 1.50 / 1.50 m  
 Topography : 1 (Flat/gentle slope; no barrier)  
 Reference angle : 0.00

↑  
 Results segment # 1: Main Street (day)

-----  
 Source height = 1.26 m

ROAD (0.00 + 52.55 + 0.00) = 52.55 dBA  

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-80	80	0.66	63.51	0.00	-9.37	-1.59	0.00	0.00	0.00	52.55

Segment Leq : 52.55 dBA

Total Leq All Segments: 52.55 dBA

↑  
 Results segment # 1: Main Street (night)

-----  
 Source height = 1.25 m

ROAD (0.00 + 45.98 + 0.00) = 45.98 dBA  

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-80	80	0.66	56.93	0.00	-9.37	-1.59	0.00	0.00	0.00	45.98

Segment Leq : 45.98 dBA

Total Leq All Segments: 45.98 dBA

↑

Cambium Inc.

TOTAL Leq FROM ALL SOURCES (DAY): 52.55  
(NIGHT): 45.98

↑  
↑

Filename: POR01.te                      Time Period: Day/Night 16/8 hours  
 Description:

Road data, segment # 1: Main Street (day/night)

-----  
 Car traffic volume : 7290/810    veh/TimePeriod \*  
 Medium truck volume : 192/21    veh/TimePeriod \*  
 Heavy truck volume : 192/21    veh/TimePeriod \*  
 Posted speed limit : 50 km/h  
 Road gradient : 0 %  
 Road pavement : 1 (Typical asphalt or concrete)

\* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 6723  
 Percentage of Annual Growth : 2.00  
 Number of Years of Growth : 12.00  
 Medium Truck % of Total Volume : 2.50  
 Heavy Truck % of Total Volume : 2.50  
 Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Main Street (day/night)

-----  
 Angle1 Angle2 : -80.00 deg 80.00 deg  
 Wood depth : 0 (No woods.)  
 No of house rows : 0 / 0  
 Surface : 1 (Absorptive ground surface)  
 Receiver source distance : 65.00 / 65.00 m  
 Receiver height : 7.50 / 7.50 m  
 Topography : 1 (Flat/gentle slope; no barrier)  
 Reference angle : 0.00

↑  
 Results segment # 1: Main Street (day)

-----  
 Source height = 1.26 m

ROAD (0.00 + 52.70 + 0.00) = 52.70 dBA  

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-80	80	0.49	63.51	0.00	-9.47	-1.34	0.00	0.00	0.00	52.70

Segment Leq : 52.70 dBA

Total Leq All Segments: 52.70 dBA

↑  
 Results segment # 1: Main Street (night)

-----  
 Source height = 1.25 m

ROAD (0.00 + 46.12 + 0.00) = 46.12 dBA  

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-80	80	0.49	56.93	0.00	-9.47	-1.34	0.00	0.00	0.00	46.12

Segment Leq : 46.12 dBA

Total Leq All Segments: 46.12 dBA

↑



Cambium Inc.

TOTAL Leq FROM ALL SOURCES (DAY): 52.70  
(NIGHT): 46.12

↑  
↑



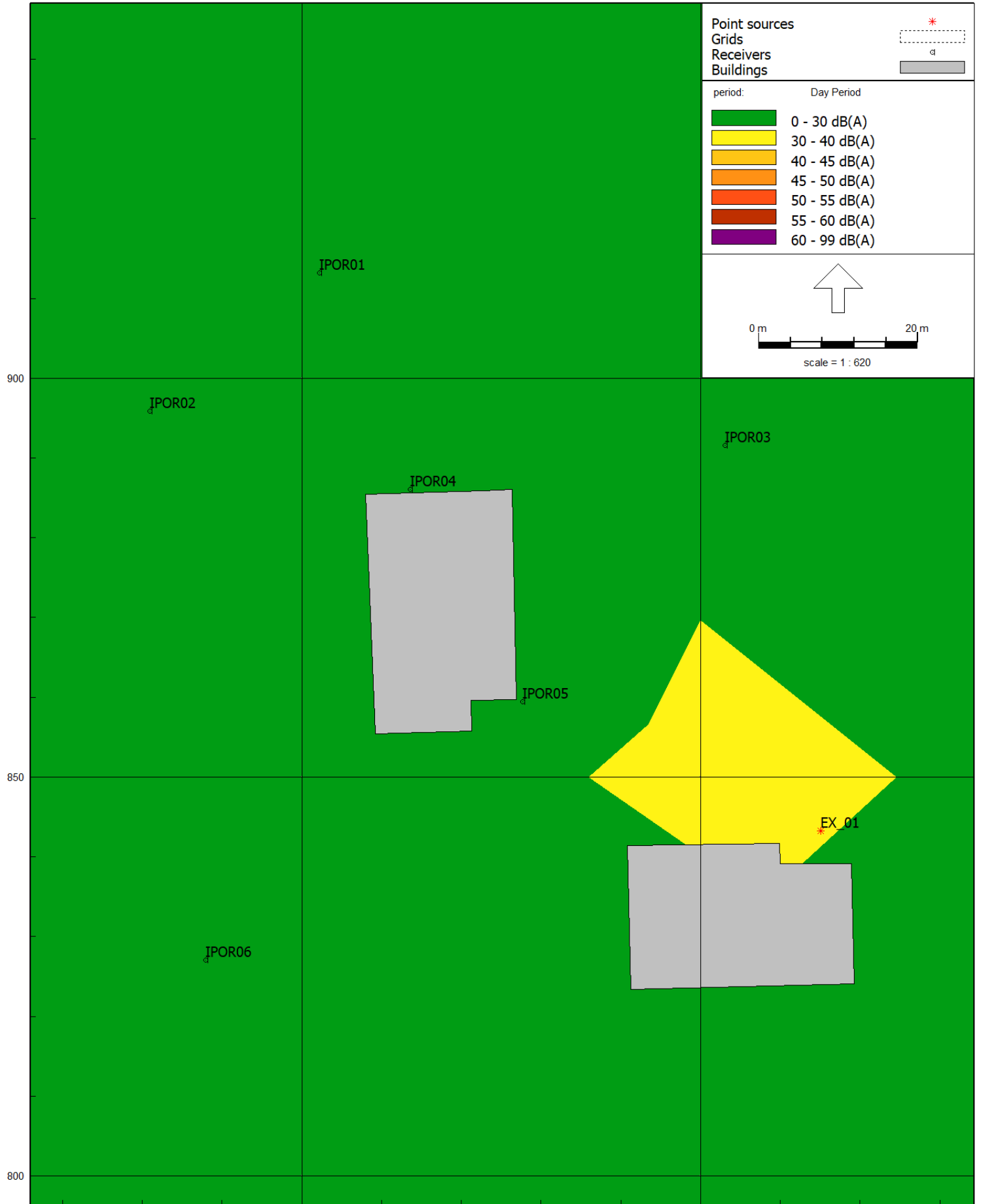
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## **Appendix C**

# **Existing Stationary Noise Source Assessment**

---

6 Oct 2021, 14:00





**Appendix C- Noise Impact Summary - Existing Stationary Sources (EX-01)**

Point of Reception ID	Point of Reception Information			Noise Characteristic	Daytime (dBA)	Evening (dBA)	Nighttime (dBA)	Daytime Limit (dBA)	Evening Limit (dBA)	Nighttime Limit (dBA)	Compliant with Limit
	Description	Height POW	Height OLA								
IPOR01	Proposed Cabin	#N/A	--	Steady State Leq	18.0	15.0	15.0	50	45	45	Yes
IPOR02	Proposed Cabin	4.5	--	Steady State Leq	4.0	0.0	0.0	50	45	45	Yes
IPOR03	Proposed Annex	4.5	--	Steady State Leq	26.0	23.0	23.0	50	45	45	Yes
IPOR04	3-Storey Brick (North)	7.5	--	Steady State Leq	15.0	12.0	12.0	50	45	45	Yes
IPOR05	3-Storey Brick (South)	7.5	--	Steady State Leq	27.0	24.0	24.0	50	45	45	Yes
IPOR06	Existing 2 Storey Dwelling	4.5	--	Steady State Leq	13.0	10.0	10.0	50	45	45	Yes



**Point Source Sound Power Level Calculations**

$$^1L_w = L_p + 20 \log(r) + 11 - 10 \log(Q)$$

$$L_p(\text{total}) = 10 \log(10^{L_p(31\text{Hz})/10} + 10^{L_p(63\text{Hz})/10} + \dots + 10^{L_p(8\text{kHz})/10})$$

r is distance measurement was taken, Q is directivity index, t is operating time

Source ID	Source Description	Source Directionality	Operating Condition	Horizontal Measurement Distance (m)	SLM Height (m)	Source Height (m)	Total Measurement Distance (m)	Measurement Directionality (deg)	Source To Receptor Directionality (deg)	Directivity Factor (Q)	Tonal (Yes/No)	Octave Band (Hz)									
												63	125	250	500	1000	2000	4000	8000	Total	
***Hidden Row***																					
												A-Weighting									
HVAC-01	Upblast Exhaust and Condensor	None	Steady State	1	2	2	1	N/A	N/A	2	No	Measured SPL (dB)	63.91	64.23	58.58	56.23	53.63	51.52	47.00	38.66	68.25
												Calculated PWL (dBA)	45.90	56.22	57.57	61.22	61.62	60.50	55.99	45.65	67.29
												Msmnt Directionality Correction (dB)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
												Receptor Directionality Correction (dB)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
												Applied PWL with Penalties (dBA)	45.90	56.22	57.57	61.22	61.62	60.50	55.99	45.65	67.29
HVAC-02	Cook 180 CPA	0	0	5	2	2	1	0	N/A	2	No	Measured SPL (dB)	78.00	77.00	78.00	71.00	68.00	63.00	58.00	56.00	82.97
												Calculated PWL (dBA)	59.99	68.99	76.99	75.99	75.99	71.99	66.99	62.99	82.07
												Msmnt Directionality Correction (dB)	-8.00	-8.00	-8.00	-9.00	-9.00	-10.00	-10.00	-10.00	
												Receptor Directionality Correction (dB)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
												Applied PWL with Penalties (dBA)	51.99	60.99	68.99	66.99	66.99	61.99	56.99	52.99	73.35



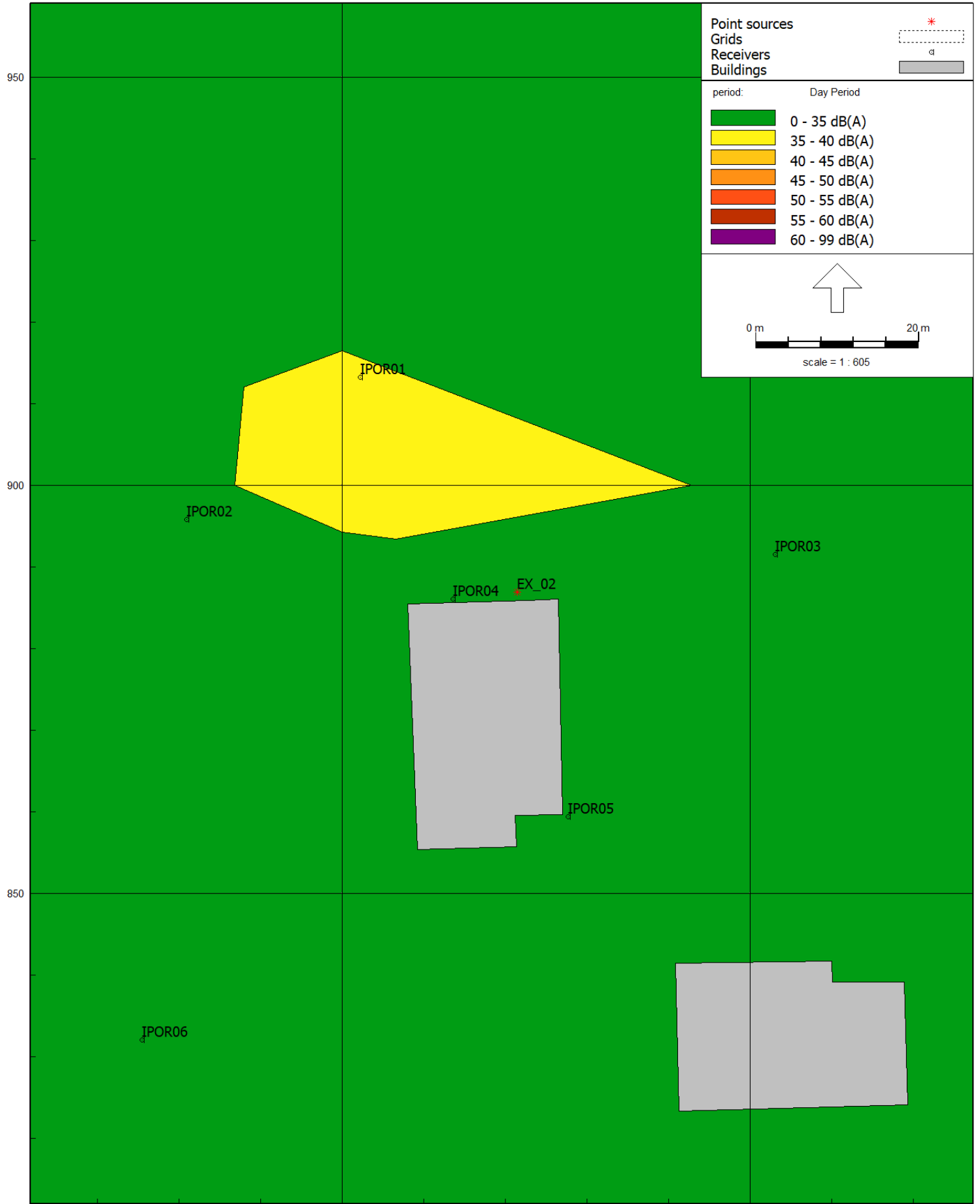
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**Appendix D**

**Proposed Stationary Noise Source Assessment**

---

6 Oct 2021, 13:59





**Appendix D - Noise Impact Summary - Proposed Stationary Sources (EX-02)**

Point of Reception ID	Point of Reception Information			Noise Characteristic	Daytime (dBA)	Evening (dBA)	Nighttime (dBA)	Daytime Limit (dBA)	Evening Limit (dBA)	Nighttime Limit (dBA)	Compliant with Limit
	Description	Height POW	Height OLA								
IPOR01	Proposed Cabin	#N/A	--	Steady State Leq	37.0	34.0	34.0	50	45	45	Yes
IPOR02	Proposed Cabin	4.5	--	Steady State Leq	34.0	31.0	31.0	50	45	45	Yes
IPOR03	Proposed Annex	4.5	--	Steady State Leq	35.0	32.0	32.0	50	45	45	Yes
IPOR04	3-Storey Brick (North)	7.5	--	Steady State Leq	47.0	44.0	44.0	50	45	45	Yes
IPOR05	3-Storey Brick (South)	7.5	--	Steady State Leq	19.0	16.0	16.0	50	45	45	Yes
IPOR06	Existing 2 Storey Dwelling	4.5	--	Steady State Leq	11.0	8.0	8.0	50	45	45	Yes





**Point Source Sound Power Level Calculations**

$$^1L_w = L_p + 20 \log(r) + 11 - 10 \log(Q)$$

$$L_p(\text{total}) = 10 \log(10(L_p(31\text{Hz})/10) + 10(L_p(63\text{Hz})/10) + \dots + 10(L_p(8\text{kHz})/10))$$

r is distance measurement was taken, Q is directivity index, t is operating time

Source ID	Source Description	Source Directionality	Operating Condition	Horizontal Measurement Distance (m)	SLM Height (m)	Source Height (m)	Total Measurement Distance (m)	Measurement Directionality (deg)	Source To Receptor Directionality (deg)	Directivity Factor (Q)	Tonal (Yes/No)	Octave Band (Hz)									
												63	125	250	500	1000	2000	4000	8000	Total	
***Hidden Row***																					
												A-Weighting									
HVAC-01	Upblast Exhaust and Condensor	None	Steady State	1	2	2	1	N/A	N/A	2	No	Measured SPL (dB)	63.91	64.23	58.58	56.23	53.63	51.52	47.00	38.66	68.25
												Calculated PWL (dBA)	45.90	56.22	57.57	61.22	61.62	60.50	55.99	45.65	67.29
												Msmnt Directionality Correction (dB)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
												Receptor Directionality Correction (dB)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
												Applied PWL with Penalties (dBA)	45.90	56.22	57.57	61.22	61.62	60.50	55.99	45.65	67.29
HVAC-02	Cook 180 CPA	0	0	5	2	2	1	0	N/A	2	No	Measured SPL (dB)	78.00	77.00	78.00	71.00	68.00	63.00	58.00	56.00	82.97
												Calculated PWL (dBA)	59.99	68.99	76.99	75.99	75.99	71.99	66.99	62.99	82.07
												Msmnt Directionality Correction (dB)	-8.00	-8.00	-8.00	-9.00	-9.00	-10.00	-10.00	-10.00	
												Receptor Directionality Correction (dB)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
												Applied PWL with Penalties (dBA)	51.99	60.99	68.99	66.99	66.99	61.99	56.99	52.99	73.35