Noise Impact Study, Lily Lake Road, Peterborough

December 11, 2023

Prepared for:
Peterborough Utilities Group Services Corp.

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CAMBIUM INC.

866.217.7900

cambium-inc.com

Peterborough | Barrie | Oshawa | Kingston

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Executive Summary

Cambium Inc. was retained by Peterborough Utilities Group Services Corp. as a due diligence exercise to complete a noise impact study for the proposed Lily Lake Solar Farm Battery Storage Project at Lily Lake Road, Peterborough, Ontario. The purpose of this study is to provide an assessment of the potential noise impacts from the operations of the site onto the nearby residential properties.

The existing facility is operated by Lily Lake Solar Inc. at 306/370/394 Lily Lake Road, RR#2, Peterborough, Ontario, and operates under the Certificate of Approval – Air # 4862-8B9SXL. It is a Class 3 Solar Facility that contains ground-mounted solar panels with a total nameplate capacity of 10-Megawatt. This report is intended to support the installation of a new 50-Megawatt battery storage project on the property. It is noted that the existing uses of the property have been in place and operating for some time.

As a reasonable worst-case scenario, the primary operations of the Lily Lake Solar Facility include the following noise sources; Tesla Megapack battery storage units, equipment associated with solar power collection such as inverters, and transformers.

Noise limits are set based on the sound level limits in the *Ontario Ministry of Environment, Conservation, and Parks document NPC-300 – Environmental Noise Guideline – Stationary and Transportation Sources – Approval and Planning, O.Reg. 359/09: Renewable Energy Approvals under the Environmental Protection Act, R.S.O. 1990, c. E. 19.*

Cambium concludes the site as presented, and with consideration of the assumptions and conditions of this report, can operate in compliance with provincial noise guidelines and local noise control by-laws and is therefore a feasible land use from a noise perspective.

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1.0 Introduction

Cambium Inc. (Cambium) was retained by Peterborough Utilities Group Services Corp., in response to a due diligence exercise to complete a noise impact study for the proposed Lily Lake Solar Farm Battery Storage Project at Lily Lake Road, Peterborough, Ontario. The purpose of this study is to provide an assessment of the potential noise impacts from the operations of the site onto the nearby residential properties.

It should be noted that this is not a study of all possible compatibility issues. Cambium was retained to complete a noise study under Ontario Ministry of Environment, Conservation, and Parks (the Ministry) document *NPC-300 – Environmental Noise Guideline – Stationary and Transportation Sources – Approval and Planning* (NPC-300) (MOECC, 2017). Other guidance such as *O.Reg. 359/09: Renewable Energy Approvals under the Environmental Protection Act, R.S.O. 1990, c. E. 19,* was also referenced.

We assessed the proposed development's noise impacts onto the surroundings. As a reasonable worst-case scenario, the primary operations of the Lily Lake Solar Facility include the following noise sources; Tesla Megapack battery storage units, equipment associated with solar power collection such as inverters, and transformers.

Delivery trailers will generally not un-couple at the facility. Any trailer un-coupling or coupling activity that might occur would be within the definition of 'infrequent' per NPC-300, therefore no coupling impulsive noise is included in this assessment.

Noise impact criteria were established in accordance with the sound level limits in NPC-300. Locations have been identified as being representative of the most sensitive points of reception in the vicinity of the Site.

1.1 Description of Proposed Development

The existing facility is operated by Lily Lake Solar Inc. at 306/370/394 Lily Lake Road, RR#2, Peterborough, Ontario, and operates under the Certificate of Approval – Air # 4862-8B9SXL. It is a Class 3 Solar Facility that contains ground-mounted solar panels with a total nameplate

capacity of10-Megawatt. This report is intended to support the installation of a new 50-Megawatt battery energy storage project on the property.

The proposed storage units are to be installed onsite, at 306/370/394 Lily Lake Road, in Peterborough. The Site is in a rural area, zoned for rural use, with nearby rural, and rural residential zones.

A site location plan showing nearby transportation noise sources is provided on Figure 1.

The Solar farm operations of the facility are generally open and active only during regular daylight hours. After sundown the plant will not receive enough solar radiation to generate electricity therefore, the fans and inverters will not be active and will not produce noise, however, for the purposes of assessment, and to be conservative, Cambium has assumed the Facility's potential operating hours will be up to 24 hours per day seven days per week. This reflects that the transformers and the battery storage units could operate 24 hours per day.

Noise sources associated with the operation of the site are described in section 2.1.

2.0 Impact of the Proposed Development onto the Environment

The development is in the preliminary design stages; therefore, this assessment is intended to confirm the site can comply with NPC-300 and local bylaws at the nearby sensitive receptors. The specific vehicle traffic increases due to the operation of this proposed development is not expected to be significant in comparison to existing traffic levels in the area with respect to noise.

2.1 Noise Source Summary

While some of the operations included in the proposed development are currently active and will remain active, other aspects are not yet constructed, therefore direct measurements of all the proposed operations were not feasible. Based on Cambium's experience with similar buildings and in discussion with the project team, we utilized manufacturer's specifications and our Cambium noise source library to develop a representative design.

Representative potential sources are summarized in Table 1 and detailed below. The locations of these representative noise sources can be found on Figure 2.

Existing

- INV01 – INV20 – At each solar collection node, the potential noise emissions are represented by two sources. The bock inverter (INV01_A) and the block transformer INV01_B.
- TF01 - This point source represents the potential noise emissions from the 10 MVA site substation.
- TR02 – This point source represents the potential noise emissions from an idling truck near the main building at the site.
- TR03_A, TR03_B, TR03_C - These moving sources represent the potential noise emissions from light trucks driving around the site roadways.

Proposed

- MP01 – MP52 - These point sources represent the potential noise emissions from the proposed Tesla Megapack battery storage units.
- TF03 - This point source represents the potential noise emissions from the 50 MVA site substation.

Delivery trailers will generally not un-couple at the facility. Any trailer un-coupling or coupling activity that might occur would be within the definition of 'infrequent' per NPC-300, therefore no coupling impulsive noise is included in this assessment. In addition, deliveries and garbage removal are also not considered noise sources per NPC-300 guidance.

2.2 Point of Reception Summary

Cambium attended the proposed development site on October 18, 2023. 14 nearby dwellings were identified as being representative of the most sensitive receptors in the vicinity of the Site, labeled as POR01 through POR14 and depicted on Figure 1. Ministry noise guidelines state a "Point of Reception" (POR) is a sensitive noise receptor including residential buildings, schools, places of worship, and hospitals (an office or commercial building is not considered a Point of Reception).

For assessment purposes we selected the points with the predictable worst case noise impacts as follows:

- POR01_A – represent a plane of window receptor, for a residential building located at 986 Fifes Bay Road, east of the Site.
    - POR01_B – is an outdoor living area PORs at the same residential buildings, located 30 m from the property in the direction of the Site.
- POR02 – This label represents a historic POR at 1011 Fifes Bay Road. This location does not represent a current POR and will not be considered in this report.
- POR03_A represents a plane of window receptor, for a residential building located at 1011 Fifes Bay Road, southeast of the Site.

  - POR03_B is a west facing plane of window receptor at the same residential building located 30 m from the property in the direction of the Site.

- POR04_A represents a plane of window receptor, for a residential building located at 390 Lily Lake Road, south of the Site. This POR was modelled at a height of 2.25 m based on the observed window heights at this split-level type dwelling.
  - POR04_B is an outdoor living area POR at the same residential building, located 30 m from the property in the direction of the Site.
- POR05_A represents a plane of window receptor, for a residential building located at 375 Lily Lake Road, south of the Site.
  - POR05_B is an outdoor living area POR at the same residential building, located 30 m from the property in the direction of the Site.
- POR06_A represents a plane of window receptor, for a residential building located at 365 Lily Lake Road, south of the Site.
  - POR06_B is an outdoor living area POR at the same residential building, located 30m from the property line in the direction of the Site.
- POR07_A represents a plane of window receptor, for a residential building located at 358 Lily Lake Road south of the Site.
  - POR07_B is an outdoor living area POR at the same residential building, located 30 m from the property line in the direction of the Site.
- POR08_A represents a plane of window receptor, for a residential building located at 350 Lily Lake Road, south of the Site.
  - POR08_B is an outdoor living area POR at the same residential building, located 30 m from the property line in the direction of the Site.
- POR09_A represents a plane of window receptor, for a residential building located at 277 Lily Lake Road, southwest of the Site.

  - POR09_B is an outdoor living area POR at the same residential building, located 30 m from the property line in the direction of the Site.

- POR10_A represents a plane of window receptor, for a residential building located at 272 Lily Lake Road, southwest of the Site.
  - POR10_B is an outdoor living area POR at the same residential building, located 30 m from the property line in the direction of the Site.
- POR11_A represents a potential receptor, for a vacant lot located on Hills Road, northwest of the Site. This location represents a 'reasonable worst-case' location on this vacant lot.
- POR12_A represents a plane of window receptor, for a residential building located at 373 Hills Road, north of the Site.
  - POR12_B is an outdoor living area POR at the same residential building, located 30 m from the property line in the direction of the Site.
- POR13_A represents a plane of window receptor, for a residential building located at 399 Hillis Road, north of the Site.
  - POR13_B is an outdoor living area POR at the same residential building, located 30 m from the property line in the direction of the Site.
- POR14_A represents a potential receptor, for a vacant lot located on Fife's Bay Road, east of the Site. This location represents a 'reasonable worst-case' location on this vacant lot. Other locations on the lot may represent closer proximity to the Development, However, these other locations are likely unfeasible for residential development based on other planning aspects such as; wetland setback, prime farmland preservation, or entrance way requirements.

Unless otherwise justified, receptor heights were either 1.5 m for OLA, or first storey plane of window receptors, 4.5 m for second storey receptors, and an additional 3 m in height for each storey taller.

2.3 Assessment Criteria

The Site is located in a rural area zoned for Rural use. The receptors are in an area with nearby Rural Residential, and Rural zones. The proposed Site and surroundings are generally best described as a noise class 3 (rural) area. However, based on local road traffic and local land use, a noise class 2 designation can be supported at some points of reception. The site and all receptors have been characterized to conform to NPC-300 with the support of local land use, and Cambium's site measurements.

The Ministry exclusionary sound level limits for Class 2 and 3 areas are described below.

Embedded Table 1 - Time Period Ministry Exclusionary Sound Level Limit (dBA)

		Sound Level Limit – L_{eq} (dBA)		
		Day (07:00 – 19:00)	Evening (19:00-23:00)	Night (23:00 – 07:00)
Class 2 Plane of Window Noise Sensitive Spaces	Steady L_{eq}	50	50	45
Class 2 Outdoor Points of Reception	Steady L_{eq}	50	45	-
Class 3 Plane of Window Noise Sensitive Spaces	Steady L_{eq}	45	40	40
Class 3 Outdoor Points of Reception	Steady L_{eq}	45	40	-

The sound level limit as received at a POR for stationary sources is the higher of either the Ministry exclusionary sound level limit (as described above), or the quietest one-hour equivalent background sound level (L_{eq}) for each of the time periods described in the table above.

The following sections support the class designations.

2.3.1 Local Ambient Noise

During the site visit, various short term on-site background noise measurements were taken at the Site which indicated that background noise due to local land use and road traffic was likely to be significant.

The Dobbin Transformer Station is a facility located at 399 Lily Lake Road. This facility has been active at this location for many years and emits an audible noise onto nearby land use.

A traffic noise assessment was conducted using predictive calculations of road noise developed by the Ministry: *Ontario Road Noise Analysis Method for Environment and Transportation* (ORNAMENT) (MOE, 1999). 2018 traffic data published by the City of Peterborough and 2017 data from Peterborough County were used for the road noise assessment. Considering local development, traffic volumes are likely to have increase since the date of the data. Percentages of medium (2%) and heavy (1%) trucks were estimated with guidance from the City of Peterborough. The lowest hour volume was calculated from the annual average daily traffic (AADT) using method described in *Typical Hourly Traffic Distribution for Noise Modelling, Canadian Acoustics* (RWDI Air Inc., 2008), therefore these calculated impacts represent the quietest hour of the given time-period.

Traffic data and ORNAMENT calculations are provided in Appendix C.

Embedded Table 2 Current Traffic Calculations Summary

Source	Min Hourly Traffic Volume [1]	Traffic Breakdown [2]			Receptor	Notes	Leq (dBA) [3]
		Min. Hourly Cars	Min. Hourly Med. Trucks	Min. Hourly Heavy Trucks			
POR01 - Day	159	154	3	2	30 m from Fife's Bay Rd (CR 12)	4.5 m Height, Front	52
POR01 - Evening	53	51	1	1	30 m from Fife's Bay Rd (CR 12)	4.5 m Height, Front	48
POR03 - Day	159	154	3	2	55 m from Fife's Bay Rd (CR 12)	4.5 m Height, Side	51
	258	250	5	3	45 m from Lily Lake Rd (2nd Line)		
POR03 - Evening	53	51	1	1	55 m from Fife's Bay Rd (CR 12)	4.5 m Height, Side	47
	85	83	2	1	45 m from Lily Lake Rd (2nd Line)		
POR05 - Day	258	250	5	3	75 m from Lily Lake Rd (2nd Line)	4.5 m Height, Front	48
POR05 - Evening	85	83	2	1	75 m from Lily Lake Rd (2nd Line)	4.5 m Height, Front	44
POR14 - Day	159	154	3	2	30 m from Fife's Bay Rd (CR 12)	4.5 m Height, Front	53
POR14 - Evening	53	51	1	1	30 m from Fife's Bay Rd (CR 12)	4.5 m Height, Front	49

1 - Traffic AADT: (2018) from *City of Peterborough, (2017) from County of Peterborough. Hourly volume calculated from AADT using method described in Typical Hourly Traffic Distribution for Noise Modelling, Canadian Acoustics 2008 (lowest hour of time period used)*

2 - Truck percentage by reference to City of Peterborough guidance and Cambium experience, applied as medium (2%) and heavy (1%) truck percentage.

Since these calculated impacts represent the quietest hour of the given time-period. The expected ambient noise due to traffic should be expected to be generally greater than the shown results and therefore greater than the class 3 exclusion limit values as defined by NPC-300. Based upon these results it is reasonable to use the calculated sound levels to support a Class 2 designation at the receptors within 75 m of Lily Lake Road or 55 m of Fife's Bay Road as are represented by POR01 though POR10, and POR14.

The results also support an elevated equivalent sound level at the receptors in proximity to Fife's Bay Road (POR01, POR03, and POR14) as shown below.

Embedded Table 3 Time Period Adjusted Sound Level Limits (dBA)

		Sound Level Limit – L_{eq} (dBA)		
		Day (07:00 – 19:00)	Evening (19:00-23:00)	Night (23:00 – 07:00)
POR01_A	Steady L_{eq}	**52**	50	45
POR01_B	Steady L_{eq}	**52**	**48**	-
POR03_A	Steady L_{eq}	**51**	50	45
POR03_B	Steady L_{eq}	**51**	**47**	-
POR14_A	Steady L_{eq}	**53**	50	45

- Bolded values elevated by traffic to be greater than exclusionary limits.

All receptors are summarized in appended Table 2 along with the applicable sound level limits.

2.4 Impact Assessment

The acoustic analysis at the PORs incorporates the noise emission points as described in Section 2.1. Cambium has based sound power levels for equipment on measurements on site, measurements at similar sites for generally assumed equipment, engineering calculations, and/or manufacturer's specifications.

The corresponding sound power level calculations from each noise producing unit are detailed in Appendix A. The assumed, most conservative, sound power levels in accordance with the Ministry's requirement for "worst case" noise source sound power levels are summarized in Table 1.

Our impact assessment results are provided in Appendix B and the expected Site noise impacts at the identified PORs are summarized in Table 2.

2.4.1 Sound Power Level

Sound power levels were based on calculations from measurements at the site and; at similar sites, engineering calculations, and manufacturer's specifications; the supporting information can be found in Appendix A. We completed all measurements following Ministry guidance for measurements including satisfactory weather conditions and pre-post calibrations.

2.4.2 Tonality Assessment

Some types of sound have a special quality which may tend to increase their audibility and potential disturbance or annoyance. For tonal sound, the Ministry NPC-104 guideline stipulates that a penalty of five A-weighted decibels (dBA) is to be added to the measured sound level if the sound has a "pronounced audible tonal quality such as a whine, screech, buzz or hum".

Sources that have been identified to be tonal would be indicated as such in Table 1 and if identified, a penalty of five dB has been added to the sources' sound power levels in the model.

2.4.3 Variable Operations of Noise Sources

The operations of the facility are generally active only during daytime hours, however, for the purposes of assessment, and to be conservative, Cambium has assumed the Facility's equipment may be active up to 24 hours per day seven days per week. Therefore, all sources were assumed to operate continuously and simultaneously with the exception of the following.

- At each solar collection node, the potential noise emissions are represented by two sources. The bock inverter (INV01_A) is modelled as active only during daytime hours (07:00 – 19:00) when the sun is high enough in the sky create significant power generation. The block transformer INV01_B is modelled as active at all times.
- A representative idling vehicle (TR02) at the site building is modelled as being active 30 minutes of any given hour (50%), during daytime hours (07:00 – 19:00).

- The moving truck noise sources (TR03) have been modelled as active, with one truck per any given hour at a speed of 10 km/hr.

2.4.4 Existing Noise Controls

Noise controls have been integrated into the design of some equipment on site as outlined below.

- BR01 – A landscaping feature with a height of approximately 2 m is located along the property lines of the site, near to POR04, POR07, and POR08.
- BR08 – A barrier has been installed at noise source INV08 which is approximately 3.5 m high. The barrier extends approximately 13 m and is positioned to screen the receptors to the south and east from this noise source.
- BR10 – A barrier has been installed at noise source INV10 which is approximately 3.5 m high. The barrier extends approximately 8 m and is positioned to screen the receptors to the south from this noise source.
- BR11 – A barrier has been installed at noise source INV11 which is approximately 3.5 m high. The barrier extends approximately 13 m and is positioned to screen the receptors to the south from this noise source.
- BR13 – A barrier has been installed at noise source INV13 which is approximately 3.5 m high. The barrier extends approximately 13 m and is positioned to screen the receptors to the south from this noise source.

2.5 Noise Impact Calculation Procedure

The noise impact calculations were performed using the Bruel Kjaer *Predictor Type 7810 version 2023* (Predictor) environmental noise prediction and control software. The calculations completed by this software are based on established prediction methods accepted by the Ministry; mainly ISO 9613-2 *Acoustics – Attenuation of Sound during Propagation Outdoors – Part 2: General Method of Calculation* (ISO, 1996). Predictor is an internationally marketed software package that offers calculation algorithms that comply with ISO 9613-2.

The Predictor software tool is a proprietary noise calculation package used to calculate, assess, predict, and display environmental noise. This software utilizes calculation algorithms and 3D visualization of the predicted noise emissions, often referred to as acoustic mapping. The software calculates the resultant noise level and takes into account a range of factors affecting the propagation of sound including:

- Sources with direct line of site to receivers ignore barriers,
- Negative ground attenuation over barriers is not subtracted,
- The Facility layout, which includes the position and elevation of each building, major equipment and other facades in the propagation path,
- The natural topography and vegetation,
- The magnitude of the noise source in terms of octave band sound power,
- The distance between the source and the POR,
- The presence of reflecting surfaces and,
- The hardness of the ground between the sources and the POR.

2.6 Calculation Assumptions

We have assessed the plane of window receptor at 1.5 metres and at the perimeter of the residence, representing the plane of a first storey exterior room door or window within which, a person may be exposed to sound if open. If the residence is multi-storey, we model the plane of window receptor at 4.5 metres for secondary storey, or 7.5 metres for third storey, etc. Any outdoor living area receptors were assessed at a height of 1.5 metres.

The noise impact modelling included a general ground factor assumption of one, which is fully absorptive to account for the vegetated surroundings.

This version of Predictor allows for settings to ignore barrier effects if line of sight is not broken, as well as avoiding overestimating barrier effect due to porous ground in the case of a negative Agr value in Equation 12 of the ISO 9613-2 calculation method. We activated these settings:

- The terrain was modelled with consideration from Ontario Base Map sources; and
- Onsite buildings were considered, and were incorporated into the model as being mostly reflective, no other offsite sources of sound were considered (i.e. traffic, etc.).

Due to the numerous conservative assumptions that have been made, this assessment is likely an over-prediction.

2.7 Proposed Noise Control Measures

Recommended noise controls are listed below and summarized in section 3.0 of this report.

- BR02_A – A barrier is required south of the proposed Tesla Megapack battery storage units (MP01 – MP52) with a height of 3 metres relative to the grade of the nearest noise sources. The barrier must extend approximately 160 m and be positioned to screen the receptors to the south (POR01, POR03, POR04) from these noise sources.
- BR03_A – A barrier is required at the site property line near to POR01, with a height of 3.5 metres. The barrier must extend approximately 65 m and be positioned to screen the receptors to the south (POR01) from the Tesla Megapack battery storage units noise sources (MP01 – MP52).
- BR04 – A barrier is required east of the noise source (TF03) as close to the noise source as feasible, with a height of 3.5 metres. The barrier must be positioned to screen the receptor to the east (POR03) from this noise source.
- BR05 – A barrier is required west of the noise source (TF03) as close to the noise source as feasible, with a height of 3.5 metres. The barrier must be positioned to screen the receptor to the west (POR04) from this noise source.

2.7.1 Conditional on Vacant Lot Development

- BR02_B – A larger barrier is conditionally required south of the proposed Tesla Megapack battery storage units (MP01 – MP52) with a height of 4.50 metres relative to the grade of the nearest noise sources. The barrier must extend approximately 200 m and be

positioned to screen the receptors to the south (POR01, POR03, POR04, POR14) from these noise sources.

- BR03_B – A larger berm/barrier combination is conditionally required at the site property line near to POR14, with a height of 8.5 metres. The barrier must extend approximately 40 m and be positioned to screen the receptors to the south (POR14) from the Tesla Megapack battery storage units noise sources (MP01 – MP52).

All proposed barriers must be continuous, without gaps or cracks, and have a surface mass density of at least 20 kilograms per square metre.

2.8 Acoustic Assessment Summary

The sound pressure level contour plot files and the predicted sound levels at the receptors are provided in Appendix B. As indicated in Table 2, the development noise impact at each established POR is predicted to be less than the applicable criteria set by the Ministry, provided recommendations of this report are followed.

The above assessment considered a worst-case point of reception for indoor and outdoor receptors, and a worst-case sound level from operations, thereby indicating conservative estimates for potential noise impact.

3.0 Recommendations Summary

In summary Cambium has made the following recommendations:

- Layout of equipment and building features may affect noise impacts, and therefore the controls required. The site should be laid out generally as shown in this report or calculations may require revision.
- The power levels used in this assessment are representative and indicate the allowable sound power levels based on preliminary design information.
    - This analysis should be updated by a qualified person to confirm compliance with NPC-300 during the detailed design stage. Alternatively, the final design may be reviewed in comparison to the sound levels and equipment layout used in this report to confirm compliance.
- Proposed noise control measures are required and described in section 2.7. These include:
    - BR02 – A barrier is required south of the proposed Tesla Megapack battery storage units (MP01 – MP52).
    - BR03 – A barrier is required at the site property line near to POR01.
    - BR04 – A barrier is required east of the noise source (TF03).
    - BR05 – A barrier is required west of the noise source (TF03).
- Conditional on the potential development of the nearby vacant lot (POR14) into noise sensitive use. Proposed noise control measures are required and described in section 2.7.1. These controls are not required unless or until the vacant lot is developed into a sensitive use. These include:
    - BR02_B – A larger barrier is required south of the proposed Tesla Megapack battery storage units (MP01 – MP52).
    - BR03_B – A larger barrier is required at the site property line near to POR14.

4.0 Closing

Cambium Inc. was retained by Peterborough Utilities Group Services Corp., in response to a due diligence exercise to complete a noise impact study for the proposed Lily Lake Solar Farm Battery Storage Project at Lily Lake Road, Peterborough. The purpose of this study is to provide an assessment of the potential noise impacts from the operations of the site onto the nearby residential properties.

The results of this noise impact study indicate, based on the information provided to Cambium, that the proposed development can be operated in accordance with NPC-300 and the local noise by-law, under the defined conditions, assumptions, and recommendations.

It is Cambium's opinion that the proposed operation is capable of operating in compliance with NPC-300 and therefore is compatible with the surroundings.

Respectfully submitted,

Cambium Inc.

Trevor Copeland, P. Eng.
Senior Project Manager

Trevor Ross,
Project Specialist

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5.0 References

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MOE. (1999). *ORNAMENT Ontario Road Noise Analysis Method for Environment and Transportation.* Ontario Ministry of the Environment.

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RWDI Air Inc. (2008). Typical Hourly Traffic Distribution for Noise Modelling. *Canadian Acoustics*.

6.0 Standard Limitations

Limited Warranty

In performing work on behalf of a client, Cambium relies on its client to provide instructions on the scope of its retainer and, on that basis, Cambium determines the precise nature of the work to be performed. Cambium undertakes all work in accordance with applicable accepted industry practices and standards. Unless required under local laws, other than as expressly stated herein, no other warranties or conditions, either expressed or implied, are made regarding the services, work or reports provided.

Reliance on Materials and Information

The findings and results presented in reports prepared by Cambium are based on the materials and information provided by the client to Cambium and on the facts, conditions and circumstances encountered by Cambium during the performance of the work requested by the client. In formulating its findings and results into a report, Cambium assumes that the information and materials provided by the client or obtained by Cambium from the client or otherwise are factual, accurate and represent a true depiction of the circumstances that exist. Cambium relies on its client to inform Cambium if there are changes to any such information and materials. Cambium does not review, analyze or attempt to verify the accuracy or completeness of the information or materials provided, or circumstances encountered, other than in accordance with applicable accepted industry practice. Cambium will not be responsible for matters arising from incomplete, incorrect or misleading information or from facts or circumstances that are not fully disclosed to or that are concealed from Cambium during the provision of services, work or reports.

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When preparing reports, Cambium considers applicable legislation, regulations, governmental guidelines and policies to the extent they are within its knowledge, but Cambium is not qualified to advise with respect to legal matters. The presentation of information regarding applicable legislation, regulations, governmental guidelines and policies is for information only and is not intended to and should not be interpreted as constituting a legal opinion concerning the work completed or conditions outlined in a report. All legal matters should be reviewed and considered by an appropriately qualified legal practitioner.

Site Assessments

A site assessment is created using data and information collected during the investigation of a site and based on conditions encountered at the time and particular locations at which fieldwork is conducted. The information, sample results and data collected represent the conditions only at the specific times at which and at those specific locations from which the information, samples and data were obtained and the information, sample results and data may vary at other locations and times. To the extent that Cambium's work or report considers any locations or times other than those from which information, sample results and data was specifically received, the work or report is based on a reasonable extrapolation from such information, sample results and data but the actual conditions encountered may vary from those extrapolations.

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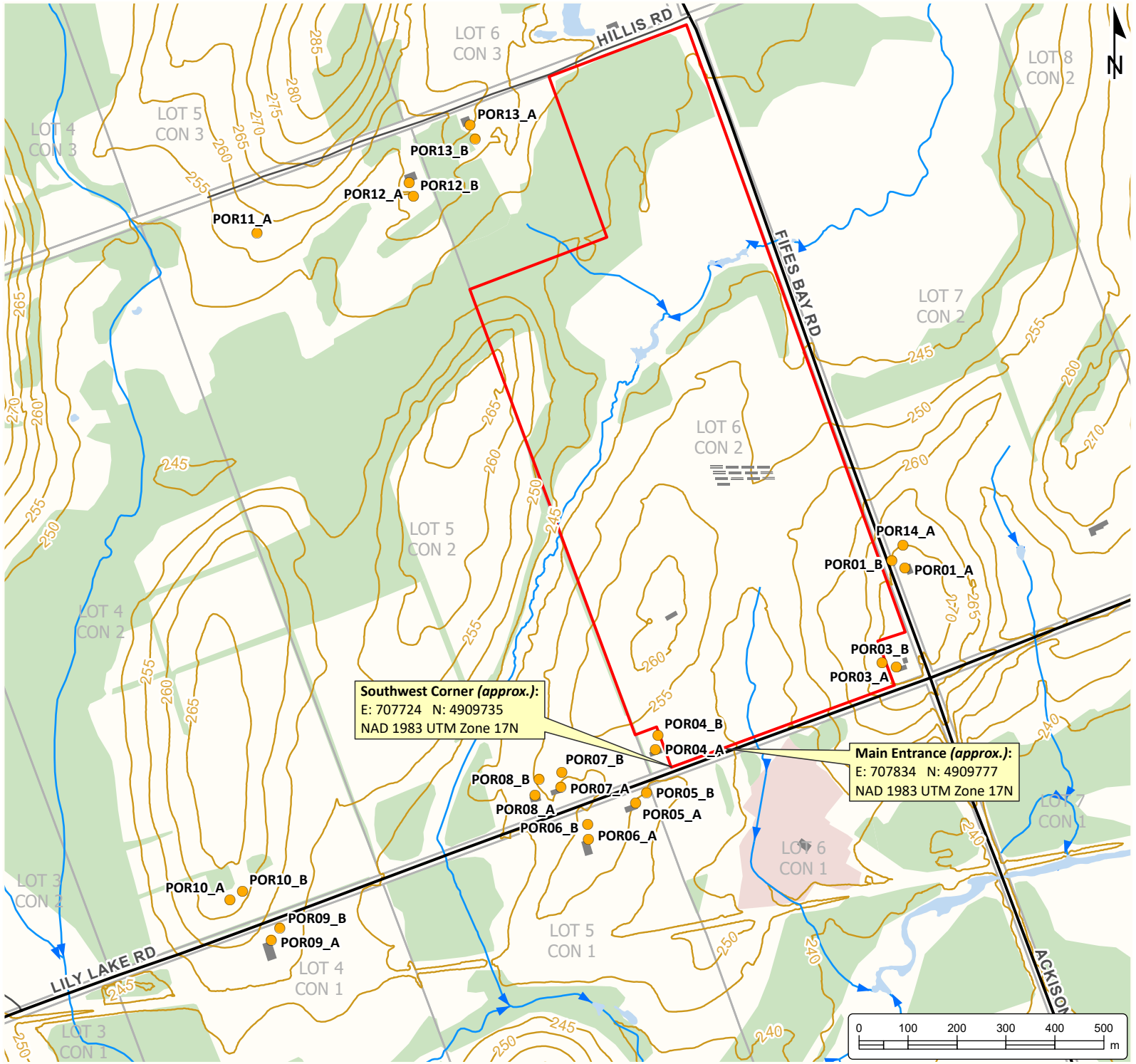
Appended Figures



NOISE IMPACT STUDY

PUG SERVICES CORP
306/370/394 Lily Lake Road, RR#2
Peterborough, Ontario

LEGEND

- Receiver
- Major Road
- Minor Road
- Watercourse, Permanent
- Contours (5m Interval)
- Lot/Concession
- Water Area
- Wooded Area
- Built Up Area
- Site (approximate)

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

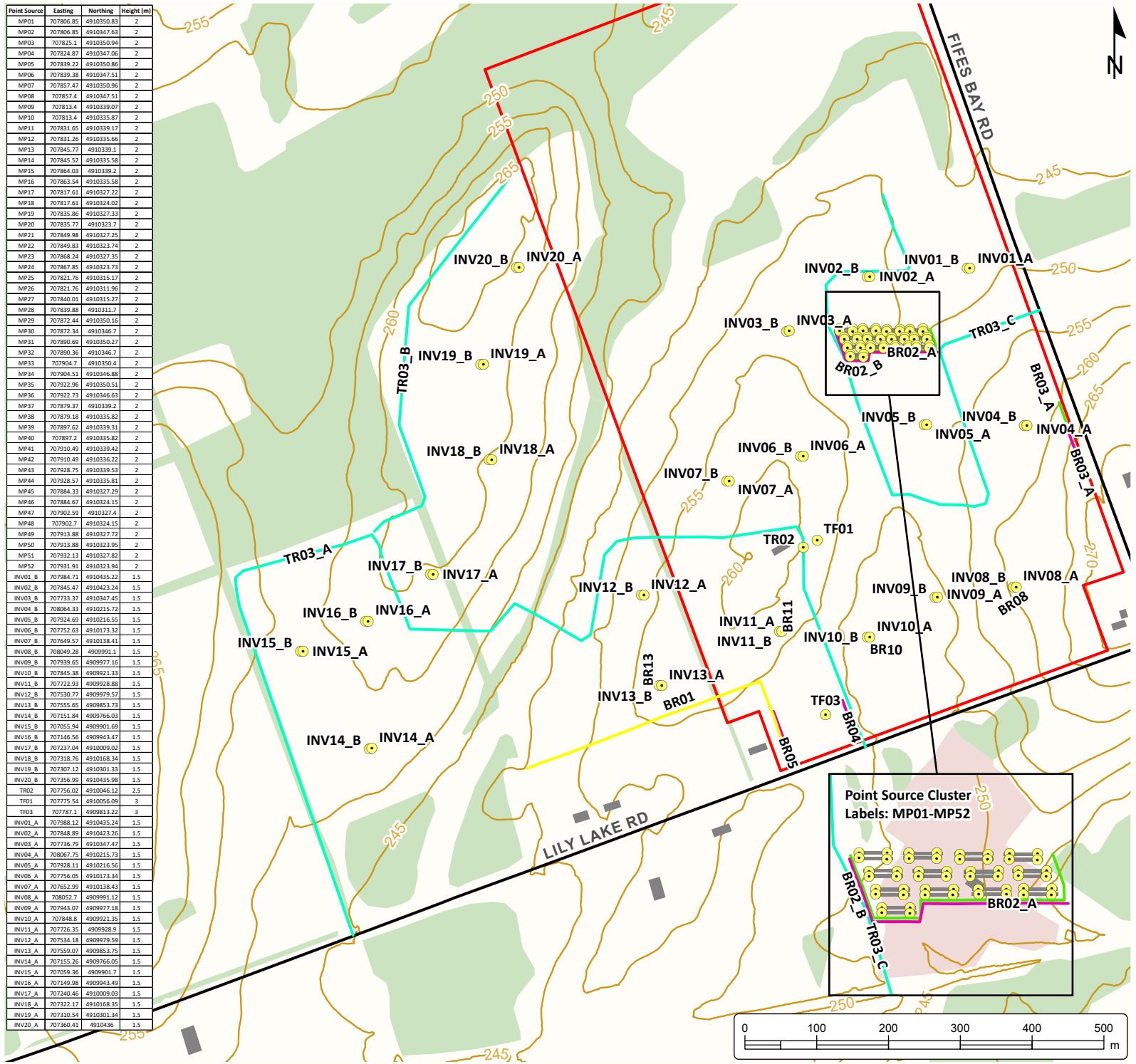
SITE LOCATION PLAN

Project No.: 18512-001		Date: January 2024 Rev.:	
Scale: 1:11,000		Projection: NAD 1983 UTM Zone 17N	
Created by: DBB	Checked by: TC	Figure: 1	

O:\GIS\MXDs\18500-18599\18512-001 PUG Services Corp - ENV - Lily Lake Solar Farm Battery Storage\2024-01-02 NIS.aprx

NOISE IMPACT STUDY

PUG SERVICES CORP
306/370/394 Lily Lake Road, RR#2
Peterborough, Ontario



Point Source	Easting	Northing	Height (m)
MP01	707806.85	4910350.83	2
MP02	707806.85	4910347.63	2
MP03	707825.1	4910350.94	2
MP04	707824.87	4910347.06	2
MP05	707839.22	4910350.86	2
MP06	707839.38	4910347.51	2
MP07	707857.47	4910350.96	2
MP08	707857.4	4910347.51	2
MP09	707813.4	4910339.07	2
MP10	707813.4	4910335.87	2
MP11	707831.65	4910339.17	2
MP12	707831.26	4910335.66	2
MP13	707845.77	4910339.1	2
MP14	707845.52	4910335.58	2
MP15	707864.03	4910339.2	2
MP16	707863.54	4910335.58	2
MP17	707817.61	4910327.22	2
MP18	707817.61	4910324.02	2
MP19	707835.86	4910327.33	2
MP20	707835.77	4910323.7	2
MP21	707849.98	4910327.25	2
MP22	707849.83	4910323.74	2
MP23	707868.24	4910327.35	2
MP24	707867.85	4910323.73	2
MP25	707821.76	4910315.17	2
MP26	707821.76	4910311.96	2
MP27	707840.01	4910315.27	2
MP28	707839.88	4910311.7	2
MP29	707872.44	4910350.16	2
MP30	707872.34	4910346.7	2
MP31	707890.69	4910350.27	2
MP32	707890.36	4910346.7	2
MP33	707904.7	4910350.4	2
MP34	707904.51	4910346.88	2
MP35	707922.96	4910350.51	2
MP36	707922.73	4910346.63	2
MP37	707879.37	4910339.2	2
MP38	707879.18	4910335.82	2
MP39	707897.62	4910339.31	2
MP40	707897.2	4910335.82	2
MP41	707910.49	4910339.42	2
MP42	707910.49	4910336.22	2
MP43	707928.75	4910339.53	2
MP44	707928.57	4910335.81	2
MP45	707884.33	4910327.29	2
MP46	707884.67	4910324.15	2
MP47	707902.59	4910327.4	2
MP48	707902.7	4910324.15	2
MP49	707913.88	4910327.72	2
MP50	707913.88	4910323.95	2
MP51	707932.13	4910327.82	2
MP52	707931.91	4910323.94	2
INV01_B	707984.71	4910435.22	1.5
INV02_B	707845.47	4910423.24	1.5
INV03_B	707733.37	4910347.45	1.5
INV04_B	708064.33	4910215.72	1.5
INV05_B	707924.69	4910216.55	1.5
INV06_B	707752.63	4910173.32	1.5
INV07_B	707649.57	4910138.41	1.5
INV08_B	708049.28	4909991.1	1.5
INV09_B	707939.65	4909977.16	1.5
INV10_B	707845.38	4909921.33	1.5
INV11_B	707722.93	4909928.88	1.5
INV12_B	707530.77	4909979.57	1.5
INV13_B	707555.65	4909853.73	1.5
INV14_B	707151.84	4909766.03	1.5
INV15_B	707055.94	4909901.69	1.5
INV16_B	707146.56	4909943.47	1.5
INV17_B	707237.04	4910009.02	1.5
INV18_B	707318.76	4910168.34	1.5
INV19_B	707307.12	4910301.33	1.5
INV20_B	707356.99	4910435.98	1.5
TR02	707756.02	4910046.12	2.5
TF01	707775.54	4910056.09	3
TF03	707787.1	4909813.22	3
INV01_A	707988.12	4910435.24	1.5
INV02_A	707848.89	4910423.26	1.5
INV03_A	707736.79	4910347.47	1.5
INV04_A	708067.75	4910215.73	1.5
INV05_A	707928.11	4910216.56	1.5
INV06_A	707756.05	4910173.34	1.5
INV07_A	707652.99	4910138.43	1.5
INV08_A	708052.7	4909991.12	1.5
INV09_A	707943.07	4909977.18	1.5
INV10_A	707848.8	4909921.35	1.5
INV11_A	707726.35	4909928.9	1.5
INV12_A	707534.18	4909979.59	1.5
INV13_A	707559.07	4909853.75	1.5
INV14_A	707155.26	4909766.05	1.5
INV15_A	707059.36	4909901.7	1.5
INV16_A	707149.98	4909943.49	1.5
INV17_A	707240.46	4910009.03	1.5
INV18_A	707322.17	4910168.35	1.5
INV19_A	707310.54	4910301.34	1.5
INV20_A	707360.41	4910436	1.5

LEGEND

- Point Source
- Moving Source
- Existing Barrier
- Proposed Controls
- Proposed Condition Controls – Vacant Lot
- Major Road
- Contours (5m Interval)
- Building
- Wooded Area
- Built Up Area
- Site

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CAMBIUM
194 Sophia Street
Peterborough, Ontario, K9H 1E5
Tel: (705) 742.7900 Fax: (705) 742.7907
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SITE PLAN

Project No.: 18512-001		Date: January 2024	
		Rev.:	
Scale: 1:7,500		Projection:	
Created by: DBB	Checked by: TC	Figure:	2

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Appended Tables

Table 1 - Noise Source Summary Table

Source ID	Description	A-Weighted Sound Power Level								Total	Data Source	Operating Times/Limits day,evening,night (%)	Noise Quality[2]	Source Location	UTM Easting	UTM Northing	Height Above Rooftop or Ground
		63	125	250	500	1000	2000	4000	8000	dBA							
INV01_A	Block Inverter	56	66	84	81	81	77	72	83	89	Site Measurements	100,--,--	T	At Grade	707988	4910435	1.5
INV01_B	Block Transformer	52	62	80	76	76	72	68	79	85	Manufacturer's Specs	100,100,100	T	At Grade	707985	4910435	1.5
INV02_A	Block Inverter	56	66	84	81	81	77	72	83	89	Site Measurements	100,--,--	T	At Grade	707849	4910423	1.5
INV02_B	Block Transformer	52	62	80	76	76	72	68	79	85	Manufacturer's Specs	100,100,100	T	At Grade	707845	4910423	1.5
INV03_A	Block Inverter	56	66	84	81	81	77	72	83	89	Site Measurements	100,--,--	T	At Grade	707737	4910347	1.5
INV03_B	Block Transformer	52	62	80	76	76	72	68	79	85	Manufacturer's Specs	100,100,100	T	At Grade	707733	4910347	1.5
INV04_A	Block Inverter	56	66	84	81	81	77	72	83	89	Site Measurements	100,--,--	T	At Grade	708068	4910216	1.5
INV04_B	Block Transformer	52	62	80	76	76	72	68	79	85	Manufacturer's Specs	100,100,100	T	At Grade	708064	4910216	1.5
INV05_A	Block Inverter	56	66	84	81	81	77	72	83	89	Site Measurements	100,--,--	T	At Grade	707928	4910217	1.5
INV05_B	Block Transformer	52	62	80	76	76	72	68	79	85	Manufacturer's Specs	100,100,100	T	At Grade	707925	4910217	1.5
INV06_A	Block Inverter	56	66	84	81	81	77	72	83	89	Site Measurements	100,--,--	T	At Grade	707756	4910173	1.5
INV06_B	Block Transformer	52	62	80	76	76	72	68	79	85	Manufacturer's Specs	100,100,100	T	At Grade	707753	4910173	1.5
INV07_A	Block Inverter	56	66	84	81	81	77	72	83	89	Site Measurements	100,--,--	T	At Grade	707653	4910138	1.5
INV07_B	Block Transformer	52	62	80	76	76	72	68	79	85	Manufacturer's Specs	100,100,100	T	At Grade	707650	4910138	1.5
INV08_A	Block Inverter	56	66	84	81	81	77	72	83	89	Site Measurements	100,--,--	T	At Grade	708053	4909991	1.5
INV08_B	Block Transformer	52	62	80	76	76	72	68	79	85	Manufacturer's Specs	100,100,100	T	At Grade	708049	4909991	1.5
INV09_A	Block Inverter	56	66	84	81	81	77	72	83	89	Site Measurements	100,--,--	T	At Grade	707943	4909977	1.5
INV09_B	Block Transformer	52	62	80	76	76	72	68	79	85	Manufacturer's Specs	100,100,100	T	At Grade	707940	4909977	1.5
INV10_A	Block Inverter	56	66	84	81	81	77	72	83	89	Site Measurements	100,--,--	T	At Grade	707849	4909921	1.5
INV10_B	Block Transformer	52	62	80	76	76	72	68	79	85	Manufacturer's Specs	100,100,100	T	At Grade	707845	4909921	1.5
INV11_A	Block Inverter	56	66	84	81	81	77	72	83	89	Site Measurements	100,--,--	T	At Grade	707726	4909929	1.5
INV11_B	Block Transformer	52	62	80	76	76	72	68	79	85	Manufacturer's Specs	100,100,100	T	At Grade	707723	4909929	1.5
INV12_A	Block Inverter	56	66	84	81	81	77	72	83	89	Site Measurements	100,--,--	T	At Grade	707534	4909980	1.5
INV12_B	Block Transformer	52	62	80	76	76	72	68	79	85	Manufacturer's Specs	100,100,100	T	At Grade	707531	4909980	1.5
INV13_A	Block Inverter	56	66	84	81	81	77	72	83	89	Site Measurements	100,--,--	T	At Grade	707559	4909854	1.5
INV13_B	Block Transformer	52	62	80	76	76	72	68	79	85	Manufacturer's Specs	100,100,100	T	At Grade	707556	4909854	1.5
INV14_A	Block Inverter	56	66	84	81	81	77	72	83	89	Site Measurements	100,--,--	T	At Grade	707155	4909766	1.5
INV14_B	Block Transformer	52	62	80	76	76	72	68	79	85	Manufacturer's Specs	100,100,100	T	At Grade	707152	4909766	1.5
INV15_A	Block Inverter	56	66	84	81	81	77	72	83	89	Site Measurements	100,--,--	T	At Grade	707059	4909902	1.5
INV15_B	Block Transformer	52	62	80	76	76	72	68	79	85	Manufacturer's Specs	100,100,100	T	At Grade	707056	4909902	1.5
INV16_A	Block Inverter	56	66	84	81	81	77	72	83	89	Site Measurements	100,--,--	T	At Grade	707150	4909943	1.5
INV16_B	Block Transformer	52	62	80	76	76	72	68	79	85	Manufacturer's Specs	100,100,100	T	At Grade	707147	4909943	1.5
INV17_A	Block Inverter	56	66	84	81	81	77	72	83	89	Site Measurements	100,--,--	T	At Grade	707240	4910009	1.5
INV17_B	Block Transformer	52	62	80	76	76	72	68	79	85	Manufacturer's Specs	100,100,100	T	At Grade	707237	4910009	1.5
INV18_A	Block Inverter	56	66	84	81	81	77	72	83	89	Site Measurements	100,--,--	T	At Grade	707322	4910168	1.5
INV18_B	Block Transformer	52	62	80	76	76	72	68	79	85	Manufacturer's Specs	100,100,100	T	At Grade	707319	4910168	1.5
INV19_A	Block Inverter	56	66	84	81	81	77	72	83	89	Site Measurements	100,--,--	T	At Grade	707311	4910301	1.5
INV19_B	Block Transformer	52	62	80	76	76	72	68	79	85	Manufacturer's Specs	100,100,100	T	At Grade	707307	4910301	1.5
INV20_A	Block Inverter	56	66	84	81	81	77	72	83	89	Site Measurements	100,--,--	T	At Grade	707360	4910436	1.5
INV20_B	Block Transformer	52	62	80	76	76	72	68	79	85	Manufacturer's Specs	100,100,100	T	At Grade	707357	4910436	1.5

Table 1 - Noise Source Summary Table

Source ID	Description	A-Weighted Sound Power Level								Total	Data Source	Operating Times/Limits day,evening,night (%)	Noise Quality[2]	Source Location	UTM Easting	UTM Northing	Height Above Rooftop or Ground
		63	125	250	500	1000	2000	4000	8000	dBA							
MP01	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707807	4910351	2.0
MP02	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707807	4910348	2.0
MP03	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707825	4910351	2.0
MP04	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707825	4910347	2.0
MP05	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707839	4910351	2.0
MP06	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707839	4910348	2.0
MP07	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707857	4910351	2.0
MP08	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707857	4910348	2.0
MP09	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707813	4910339	2.0
MP10	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707813	4910336	2.0
MP11	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707832	4910339	2.0
MP12	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707831	4910336	2.0
MP13	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707846	4910339	2.0
MP14	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707846	4910336	2.0
MP15	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707864	4910339	2.0
MP16	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707864	4910336	2.0
MP17	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707818	4910327	2.0
MP18	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707818	4910324	2.0
MP19	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707836	4910327	2.0
MP20	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707836	4910324	2.0
MP21	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707850	4910327	2.0
MP22	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707850	4910324	2.0
MP23	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707868	4910327	2.0
MP24	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707868	4910324	2.0
MP25	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707822	4910315	2.0
MP26	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707822	4910312	2.0
MP27	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707840	4910315	2.0
MP28	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707840	4910312	2.0
MP29	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707872	4910350	2.0
MP30	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707872	4910347	2.0
MP31	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707891	4910350	2.0
MP32	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707890	4910347	2.0
MP33	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707905	4910350	2.0
MP34	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707905	4910347	2.0
MP35	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707923	4910351	2.0
MP36	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707923	4910347	2.0
MP37	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707879	4910339	2.0
MP38	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707879	4910336	2.0
MP39	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707898	4910339	2.0
MP40	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707897	4910336	2.0

Table 1 - Noise Source Summary Table

Source ID	Description	A-Weighted Sound Power Level								Total	Data Source	Operating Times/Limits day,evening,night (%)	Noise Quality[2]	Source Location	UTM Easting	UTM Northing	Height Above Rooftop or Ground
		63	125	250	500	1000	2000	4000	8000	dBA							
MP41	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707910	4910339	2.0
MP42	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707910	4910336	2.0
MP43	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707929	4910340	2.0
MP44	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707929	4910336	2.0
MP45	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707884	4910327	2.0
MP46	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707885	4910324	2.0
MP47	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707903	4910327	2.0
MP48	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707903	4910324	2.0
MP49	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707914	4910328	2.0
MP50	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707914	4910324	2.0
MP51	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707932	4910328	2.0
MP52	Tesla Megapack	--	78	81	93	95	93	90	86	99	Manufacturer's Specs	100,100,100	SS	At Grade	707932	4910324	2.0
TF01	Transformer Station	63	68	78	88	86	80	71	62	91	Manufacturer's Specs	100,100,100	**T**	At Grade	707776	4910056	3.0
TF03	Transformer Station	72	76	86	96	95	88	79	70	99	Manufacturer's Specs	100,100,100	**T**	At Grade	707787	4909813	3.0
TR02	Site Trucks - Idle	73	79	82	88	91	91	86	74	96	Cambium Noise Source Library	50,--,--	SS	Rooftop	707756	4910046	2.5
TR03_A	Site Trucks - Light	68	75	77	76	76	74	68	60	83	Cambium Noise Source Library	100,--,--	SS	Site Roadways	707843	4909768	1.5
TR03_B	Site Trucks - Light	68	75	77	76	76	74	68	60	83	Cambium Noise Source Library	100,--,--	SS	Site Roadways	707159	4910069	1.5
TR03_C	Site Trucks - Light	68	75	77	76	76	74	68	60	83	Cambium Noise Source Library	100,--,--	SS	Site Roadways	708085	4910377	1.5

SS - Steady State
T - Tonal
I - Impulse

Table 2A - Noise Impact Summary - Steady State

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	UTM Easting	UTM Northing	Height POW	Height OLA								
POR01_A	986 Fifes Bay Rd	708202	4910142	1.5	-	Steady State Leq	47	47	47	**52**	**50**	**45**	No
POR01_B	OLA	708175	4910158	-	1.5	Steady State Leq	50	50	-	**52**	**48**	**-**	No
POR03_A	1011 Fifes Bay Rd	708184	4909940	4.5	-	Steady State Leq	47	47	47	**51**	**50**	**45**	No
POR03_B	OLA	708155	4909949	-	1.5	Steady State Leq	46	46	-	**51**	**47**	**-**	Yes
POR04_A	390 Lily Lake Rd	707692	4909771	2.25	-	Steady State Leq	48	48	48	**50**	**50**	**45**	No
POR04_B	OLA	707697	4909800	-	1.5	Steady State Leq	46	45	-	**50**	**45**	**-**	Yes
POR05_A	375 Lily Lake Rd	707652	4909662	1.5	-	Steady State Leq	42	41	41	**50**	**50**	**45**	Yes
POR05_B	OLA	707674	4909683	-	1.5	Steady State Leq	43	43	-	**50**	**45**	**-**	Yes
POR06_A	365 Lily Lake Rd	707555	4909588	4.5	-	Steady State Leq	40	40	40	**50**	**50**	**45**	Yes
POR06_B	OLA	707554	4909618	-	1.5	Steady State Leq	39	39	-	**50**	**45**	**-**	Yes
POR07_A	358 Lily Lake Rd	707499	4909695	1.5	-	Steady State Leq	37	37	37	**50**	**50**	**45**	Yes
POR07_B	OLA	707501	4909725	-	1.5	Steady State Leq	37	36	-	**50**	**45**	**-**	Yes
POR08_A	350 Lily Lake Rd	707446	4909679	4.5	-	Steady State Leq	38	37	37	**50**	**50**	**45**	Yes
POR08_B	OLA	707454	4909711	-	1.5	Steady State Leq	37	36	-	**50**	**45**	**-**	Yes
POR09_A	277 Lily Lake Rd	706907	4909382	4.5	-	Steady State Leq	33	33	33	**50**	**50**	**45**	Yes
POR09_B	OLA	706925	4909407	-	1.5	Steady State Leq	32	32	-	**50**	**45**	**-**	Yes
POR10_A	272 Lily Lake Rd	706823	4909464	4.5	-	Steady State Leq	34	33	33	**50**	**50**	**45**	Yes
POR10_B	OLA	706848	4909481	-	1.5	Steady State Leq	33	32	-	**50**	**45**	**-**	Yes
POR11_A	Vacant - Hills Rd	706878	4910827	4.5	-	Steady State Leq	34	34	34	45	40	40	Yes
POR12_A	373 Hills Rd	707189	4910930	4.5	-	Steady State Leq	39	39	39	45	40	40	Yes
POR12_B	OLA	707198	4910902	-	1.5	Steady State Leq	38	38	-	45	40	-	Yes
POR13_A	399 Hillis Rd	707313	4911048	4.5	-	Steady State Leq	39	39	39	45	40	40	Yes
POR13_B	OLA	707324	4911019	-	1.5	Steady State Leq	38	38	-	45	40	-	Yes
POR14_A	Vacant - Fifes Bay Rd	708198	4910189	4.5	-	Steady State Leq	51	51	51	**53**	**50**	**45**	No

Table 2B - Noise Impact Summary - Steady State - (No Vacant Lots)

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	UTM Easting	UTM Northing	Height POW	Height OLA								
POR01_A	986 Fifes Bay Rd	708202	4910142	1.5	-	Steady State Leq	45	45	45	**52**	**50**	**45**	Yes
POR01_B	OLA	708175	4910158	-	1.5	Steady State Leq	47	47	-	**52**	**48**	**-**	Yes
POR03_A	1011 Fifes Bay Rd	708184	4909940	4.5	-	Steady State Leq	45	45	45	**51**	**50**	**45**	Yes
POR03_B	OLA	708155	4909949	-	1.5	Steady State Leq	45	45	-	**51**	**47**	**-**	Yes
POR04_A	390 Lily Lake Rd	707692	4909771	2.25	-	Steady State Leq	44	44	44	**50**	**50**	**45**	Yes
POR04_B	OLA	707697	4909800	-	1.5	Steady State Leq	43	43	-	**50**	**45**	**-**	Yes
POR05_A	375 Lily Lake Rd	707652	4909662	1.5	-	Steady State Leq	41	41	41	**50**	**50**	**45**	Yes
POR05_B	OLA	707674	4909683	-	1.5	Steady State Leq	42	42	-	**50**	**45**	**-**	Yes
POR06_A	365 Lily Lake Rd	707555	4909588	4.5	-	Steady State Leq	39	39	39	**50**	**50**	**45**	Yes
POR06_B	OLA	707554	4909618	-	1.5	Steady State Leq	37	37	-	**50**	**45**	**-**	Yes
POR07_A	358 Lily Lake Rd	707499	4909695	1.5	-	Steady State Leq	36	35	35	**50**	**50**	**45**	Yes
POR07_B	OLA	707501	4909725	-	1.5	Steady State Leq	36	35	-	**50**	**45**	**-**	Yes
POR08_A	350 Lily Lake Rd	707446	4909679	4.5	-	Steady State Leq	37	36	36	**50**	**50**	**45**	Yes
POR08_B	OLA	707454	4909711	-	1.5	Steady State Leq	36	35	-	**50**	**45**	**-**	Yes
POR09_A	277 Lily Lake Rd	706907	4909382	4.5	-	Steady State Leq	33	32	32	**50**	**50**	**45**	Yes
POR09_B	OLA	706925	4909407	-	1.5	Steady State Leq	32	32	-	**50**	**45**	**-**	Yes
POR10_A	272 Lily Lake Rd	706823	4909464	4.5	-	Steady State Leq	33	33	33	**50**	**50**	**45**	Yes
POR10_B	OLA	706848	4909481	-	1.5	Steady State Leq	32	32	-	**50**	**45**	**-**	Yes
POR11_A	Vacant - Hills Rd	706878	4910827	4.5	-	Steady State Leq	34	34	34	**-**	**-**	**-**	n/a
POR12_A	373 Hills Rd	707189	4910930	4.5	-	Steady State Leq	39	39	39	45	40	40	Yes
POR12_B	OLA	707198	4910902	-	1.5	Steady State Leq	38	38	-	45	40	-	Yes
POR13_A	399 Hillis Rd	707313	4911048	4.5	-	Steady State Leq	39	39	39	45	40	40	Yes
POR13_B	OLA	707324	4911019	-	1.5	Steady State Leq	39	38	-	45	40	-	Yes
POR14_A	Vacant - Fifes Bay Rd	708198	4910189	4.5	-	Steady State Leq	50	50	50	**-**	**-**	**-**	n/a

Table 2C - Noise Impact Summary - Steady State - Mitigated - (With Vacant Lots)

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	UTM Easting	UTM Northing	Height POW	Height OLA								
POR01_A	986 Fifes Bay Road	708202	4910142	1.5	-	Steady State Leq	43	43	43	**52**	**50**	**45**	Yes
POR01_B	OLA	708175	4910158	-	1.5	Steady State Leq	46	46	-	**52**	**48**	**-**	Yes
POR03_A	1011 Fifes Bay Road	708184	4909940	4.5	-	Steady State Leq	44	43	43	**51**	**50**	**45**	Yes
POR03_B	OLA	708155	4909949	-	1.5	Steady State Leq	43	43	-	**51**	**47**	**-**	Yes
POR04_A	390 Lily Lake Rd	707692	4909771	2.3	-	Steady State Leq	43	43	43	**50**	**50**	**45**	Yes
POR04_B	OLA	707697	4909800	-	1.5	Steady State Leq	42	42	-	**50**	**45**	**-**	Yes
POR05_A	375 Lily Lake Rd	707652	4909662	1.5	-	Steady State Leq	40	40	40	**50**	**50**	**45**	Yes
POR05_B	OLA	707674	4909683	-	1.5	Steady State Leq	42	41	-	**50**	**45**	**-**	Yes
POR06_A	365 Lily Lake Rd	707555	4909588	4.5	-	Steady State Leq	39	38	38	**50**	**50**	**45**	Yes
POR06_B	OLA	707554	4909618	-	1.5	Steady State Leq	36	36	-	**50**	**45**	**-**	Yes
POR07_A	358 Lily Lake Rd	707499	4909695	1.5	-	Steady State Leq	35	34	34	**50**	**50**	**45**	Yes
POR07_B	OLA	707501	4909725	-	1.5	Steady State Leq	35	35	-	**50**	**45**	**-**	Yes
POR08_A	350 Lily Lake Rd	707446	4909679	4.5	-	Steady State Leq	36	35	35	**50**	**50**	**45**	Yes
POR08_B	OLA	707454	4909711	-	1.5	Steady State Leq	35	34	-	**50**	**45**	**-**	Yes
POR09_A	277 Lily Lake Rd	706907	4909382	4.5	-	Steady State Leq	32	31	31	**50**	**50**	**45**	Yes
POR09_B	OLA	706925	4909407	-	1.5	Steady State Leq	31	31	-	**50**	**45**	**-**	Yes
POR10_A	272 Lily Lake Rd	706823	4909464	4.5	-	Steady State Leq	32	32	32	**50**	**50**	**45**	Yes
POR10_B	OLA	706848	4909481	-	1.5	Steady State Leq	32	31	-	**50**	**45**	**-**	Yes
POR11_A	Vacant - Hills Rd	706878	4910827	4.5	-	Steady State Leq	34	33	33	45	40	40	Yes
POR12_A	373 Hills Rd	707189	4910930	4.5	-	Steady State Leq	39	38	38	45	40	40	Yes
POR12_B	OLA	707198	4910902	-	1.5	Steady State Leq	38	38	-	45	40	-	Yes
POR13_A	399 Hillis Rd	707313	4911048	4.5	-	Steady State Leq	39	39	39	45	40	40	Yes
POR13_B	OLA	707324	4911019	-	1.5	Steady State Leq	38	38	-	45	40	-	Yes
POR14_A	Vac	708198	4910189	4.5	-	Steady State Leq	46	45	45	**53**	**50**	**45**	Yes

Appendix A

Noise Source Supporting Information

Raw Measurement Data

	1/3rd Octave Centre Frequency (Hz), Sound Pressure Level (dB)																							
Source ID	**50**	**63**	**80**	**100**	**125**	**160**	**200**	**250**	**315**	**400**	**500**	**630**	**800**	**1000**	**1250**	**1600**	**2000**	**2500**	**3150**	**4000**	**5000**	**6300**	**8000**	**10000**
MP01_A1	0.0	0.0	0.0	37.1	38.2	40.4	40.8	42.4	43.3	58.1	53.2	55.3	60.3	52.0	58.4	55.5	57.4	55.0	54.2	53.9	56.8	55.5	49.2	44.3
MP01_A2	0.0	0.0	0.0	37.9	40.0	42.1	41.5	39.8	41.2	50.3	48.0	49.1	53.2	47.2	52.9	48.6	49.3	47.6	44.6	42.4	43.5	40.1	34.6	28.6
MP01_A3	0.0	0.0	0.0	32.7	32.9	37.7	39.6	38.2	40.7	53.8	52.3	55.2	58.9	50.3	56.9	54.6	54.7	53.2	50.9	48.4	49.7	45.9	40.3	33.6
MP01_A4	0.0	0.0	0.0	35.6	39.3	40.8	38.4	37.9	44.6	54.8	50.4	51.8	55.9	46.8	53.6	49.2	49.1	46.3	43.6	40.8	41.7	35.9	30.2	23.1
MP01	0.0	0.0	0.0	36.2	38.3	40.5	40.2	39.9	42.8	55.1	51.4	53.5	57.8	49.6	56.0	53.0	54.1	51.9	50.4	49.3	51.8	50.1	43.9	38.7
INV01_B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TF03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TR02	75.5	69.4	66.3	69.6	64.7	66.5	65.0	63.1	61.4	62.9	66.0	61.5	64.2	65.0	62.7	63.1	62.7	62.3	60.8	56.0	54.2	50.9	46.4	42.8
TR03	54.4	65.7	54.4	60.7	55.1	58.0	49.7	55.0	53.9	47.5	45.4	46.2	44.8	43.4	42.5	42.0	39.1	37.9	36.2	32.9	31.9	30.2	28.1	26.6
TF01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TF01	50.8	47.5	48.8	41.1	45.2	43.9	42.4	46.7	48.6	53.7	47.6	48.8	49.2	44.5	41.9	41.6	38.0	33.6	31.3	29.5	26.5	24.4	22.9	20.9
INV04_A	50.2	55.2	49.6	50.1	52.6	52.8	59.4	66.9	57.9	54.4	53.6	53.3	52.7	49.7	49.6	47.3	44.9	44.4	40.3	38.9	43.2	58.9	45.8	34.0

Point Source Sound Power Level Calculations

*[1]Lw=Lp+20*log(r)+11-10*log(Q)*

*Lp(total)=10*log(10(Lp(31Hz)/10)+10(Lp(63Hz)/10)+…+10(Lp(8kHz)/10))*

r is distance measurement was taken, Q is directivity index

						SPL (dB)		PWL (dB)									
File Name	Source ID	Total Measurement Distance (m)	Directivity Factor (Q)	Quasi Steady (Yes/No)	Tonal (Yes/No)	Total (dB)	Total (dBA)	63	125	250	500	1000	2000	4000	8000	Total (dB)	Total (dBA)
	MP01	-	-	No	No	-	-	-	94.00	89.47	95.91	94.94	91.38	88.94	86.81	**101.16**	99.21
L_00002	TR02	5.25	2	No	No	**80**	74	99	95	91	91	91	90	85	75	**102**	96
L_00049	TR03	10.00	2	No	No	**69**	55	94	91	86	79	76	73	67	61	**97**	83
20230913007	INV04_A	4.00	2	No	Yes	**70**	64	82	82	93	84	81	76	71	84	**95**	89

Emitting Façade Sound Power Level Calculations

*[1]Lw=Lp+10*log(A)*
*Lp(total)=10*log(10(Lp(31Hz)/10)+10(Lp(63Hz)/10)+…+10(Lp(8kHz)/10))*
A is area of emitting façade

					Measured SPL (dB)		PWL With Penalties (dB)									
File Name	Source ID	Façade Area (m^2)	Quasi Steady (Yes/No)	Tonal (Yes/No)	Total (dB)	Total (dBA)	63	125	250	500	1000	2000	4000	8000	Total (dB)	Total (dBA)
Specs02	INV01_B	18.4	No	Yes	**73**	67	78	78	89	79	76	71	67	80	**91**	84.6
Specs03	TF03	80	No	Yes	**79**	75	98	92	95	99	95	87	78	71	**103**	99
Specs06	TF01	39	No	Yes	**74**	70	89	84	87	91	86	79	70	63	**95**	90.9

West Caldwell Calibration Laboratories Inc.

Certificate of Calibration

for

HANDHELD ANALYZER

Manufactured by:	BRUEL & KJAER
Model No:	2270
Serial No:	2679353
Calibration Recall No:	33845

Submitted By:

Customer:	TREVOR ROSS
Company:	Cambium Inc.
Address:	194 SOPHIA STREET
	Peterborough, On Canada K9H 1E5

The subject instrument was calibrated to the indicated specification using standards traceable to the SI through the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Procedure No. 2270 BRUE

Upon receipt for Calibration, the instrument was found to be:

Within (X)

tolerance of the indicated specification. See attached Report of Calibration.
The information supplied certifies that the item listed above meets acceptance criteria under the decision rule: A=(L-(U95)), where A is the acceptance criteria, L is manufacturer specifications, and U95 is confidence level of 95% at k=2. The decision rule has been communicated and approved by customer during contract review. Measurements marked with (*) are not covered by the scope of current A2LA accreditation.

West Caldwell Calibration Laboratories' calibration control system meets the following requirements: ANSI/NCSL Z540-1, ISO 9001, and ISO 17025.

Note: With this Certificate, Report of Calibration is included.

Approved by:

James Zhu

Quality Manager

Calibration Date:	07-Mar-23
Certificate Issue Date:	09-Mar-23
Certificate No:	33845 -1

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor, NY 14564, U.S.A.

ISO/IEC 17025

A2LA ACCREDITED

Calibration Lab. Cert. # 1533.01

West Caldwell Calibration Laboratories Inc.

Certificate of Calibration

for

MICROPHONE

Manufactured by:	BRUEL & KJAER
Model No:	4189
Serial No:	2695416
Calibration Recall No:	33845

Submitted By:

Customer:	TREVOR ROSS
Company:	Cambium Inc.
Address:	194 SOPHIA STREET
	Peterborough, On Canada K9H 1E5

The subject instrument was calibrated to the indicated specification using standards traceable to the SI through the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Procedure No. 4189 BRUE

Upon receipt for Calibration, the instrument was found to be:

Within (X)

tolerance of the indicated specification. See attached Report of Calibration.
The information supplied certifies that the item listed above meets acceptance criteria under the decision rule: A=(L-(U95)), where A is the acceptance criteria, L is manufacturer specifications, and U95 is confidence level of 95% at k=2. The decision rule has been communicated and approved by customer during contract review. Measurements marked with (*) are not covered by the scope of current A2LA accreditation.

West Caldwell Calibration Laboratories' calibration control system meets the following requirements: ANSI/NCSL Z540-1, ISO 9001, and ISO 17025.

Note: With this Certificate, Report of Calibration is included.

Approved by:

James Zhu

Quality Manager

Calibration Date:	07-Mar-23
Certificate Issue Date:	09-Mar-23
Certificate No:	33845 -2

QA Doc. #1051 Rev. 3.0 5/29/20

ISO/IEC 17025

A2LA ACCREDITED

Calibration Lab. Cert. # 1533.01

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor, NY 14564, U.S.A.

West Caldwell Calibration Laboratories Inc.

Certificate of Calibration

for

PRECISION ACOUSTIC CALIBRATOR

Manufactured by:	**BRUEL & KJAER**
Model No:	**CAL200**
Serial No:	**15401**
Calibration Recall No:	**33845**

Submitted By:

Customer:	**TREVOR ROSS**
Company:	**Cambium Inc.**
Address:	**194 SOPHIA STREET**
	Peterborough, On Canada K9H 1E5

The subject instrument was calibrated to the indicated specification using standards traceable to the SI through the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Procedure No. **CAL200 BRUE**

Upon receipt for Calibration, the instrument was found to be:

Within (X)

tolerance of the indicated specification. See attached Report of Calibration.
The information supplied certifies that the item listed above meets acceptance criteria under the decision rule: A=(L-(U95)), where A is the acceptance criteria, L is manufacturer specifications, and U95 is confidence level of 95% at k=2. The decision rule has been communicated and approved by customer during contract review. Measurements marked with (*) are not covered by the scope of current A2LA accreditation.

West Caldwell Calibration Laboratories' calibration control system meets the following requirements: ANSI/NCSL Z540-1, ISO 9001, and ISO 17025.

Note: With this Certificate, Report of Calibration is included.

Approved by:

James Zhu

Quality Manager

Calibration Date:	**07-Mar-23**
Certificate Issue Date:	**09-Mar-23**
Certificate No:	**33845 -3**

West Caldwell Calibration Laboratories, Inc.
uncompromised calibration
1575 State Route 96, Victor, NY 14564, U.S.A.

ISO/IEC 17025

A2LA ACCREDITED

Calibration Lab. Cert. # 1533.01

Hourly Data Report for October 18, 2023

If selected Local Standard Time (LST), add 1 hour to adjust for Daylight Saving Time where and when it is observed.

PETERBOROUGH A
ONTARIO
Current Station Operator: NAVCAN

Latitude:	44°13'48.000" N
Longitude:	78°21'48.000" W
Elevation:	191.40 m
Climate ID:	6166415
WMO ID:	71436
TC ID:	YPQ

TIME LST	Temp °C	Dew Point °C	Rel Hum %	Precip. Amount mm	Wind Dir 10's deg	Wind Spd km/h	Visibility km	Stn Press kPa	Hmdx	Wind Chill	Weather
00:00	7.3	6.7	96	0.0		0	16.1	99.48			NA
01:00	7.8	7.2	96	0.0	M	4	16.1	99.50			NA
02:00	7.7	7.4	98	0.0	25	4	16.1	99.52			NA
03:00	7.6	7.2	97	0.0		0	16.1	99.51			NA
04:00	7.7	7.4	98	0.0		0	16.1	99.54			NA
05:00	7.6	7.3	98	0.0		0	16.1	99.57			NA
06:00	7.6	7.3	98	0.0	28	5	16.1	99.61			NA
07:00	7.7	7.4	98	0.0		0	16.1	99.64			NA
08:00	8.8	8.4	97	0.0	2	4	16.1	99.65			NA
09:00	10.9	8.5	85	0.0	18	8	16.1	99.69			NA
10:00	12.8	5.0	59	0.0	20	15	16.1	99.68			NA
11:00	14.2	4.7	52	0.0	25	21	16.1	99.67			NA
12:00	13.6	5.3	57	0.0	20	15	16.1	99.64			NA
13:00	13.5	5.0	56	0.0	20	18	16.1	99.59			NA
14:00	13.0	5.3	59	0.0	23	8	16.1	99.57			NA
15:00	13.3	5.8	60	0.0	21	18	16.1	99.57			NA
16:00	12.3	6.4	67	0.0	20	15	16.1	99.56			NA
17:00	11.4	7.0	74	0.0	18	11	16.1	99.54			NA
18:00	10.6	7.5	81	0.0	17	8	16.1	99.55			NA
19:00	10.9	8.0	82	0.0	18	5	16.1	99.53			NA
20:00	10.7	7.6	81	0.0	20	5	16.1	99.55			NA
21:00	11.1	7.3	77	0.0	21	5	16.1	99.54			NA

TIME LST	Temp °C	Dew Point °C	Rel Hum %	Precip. Amount mm	Wind Dir 10's deg	Wind Spd km/h	Visibility km	Stn Press kPa	Hmdx	Wind Chill	Weather
22:00	10.2	6.7	79	0.0		0	16.1	99.50			NA
23:00	6.8	6.5	98	0.0	21	5	16.1	99.51			NA

Legend

- E = Estimated
- M = Missing
- NA = Not Available*
- [empty] = Indicates an unobserved value

Date modified:

2023-11-07

Tesla Megapacks - Battery Storage Unit Testing Data

Pack Size (m)		
Length	**Width**	**Height**
7.17	1.66	2.52

December 2020 - Measured Sound Pressure Levels (SPL) at 10m distances, 1m above grade, from midpoints of indicated Megapack surfaces

					Front						
Duty	Ambient	20%	30%	40%	50%	60%	70%	80%	90%	100%	9-Fan Correction
Octave 1/3	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	
100	31.3	37.5	37.1	33.2	31.8	35.4	36.0	33.9	36.3	38.0	37.14783213
125	32.8	39.0	38.6	33.4	34.0	36.6	38.0	36.1	38.4	39.1	38.23572256
160	33.5	46.4	40.7	37.1	37.2	39.8	40.6	39.4	41.5	41.2	40.3692478
200	34.5	41.0	48.7	39.2	39.4	38.8	41.1	41.0	41.9	41.6	40.75350332
250	34.5	39.3	41.0	52.6	59.0	44.1	44.0	43.1	43.8	43.2	42.3649885
315	36.8	40.4	40.6	36.5	37.9	50.4	55.2	59.5	45.7	44.2	43.3126891
400	35.2	39.8	42.4	39.0	39.8	41.9	42.7	45.2	59.3	59.0	58.09064812
500	31.4	41.2	42.8	46.3	49.5	49.1	49.5	51.4	52.6	54.1	53.24670053
630	31.6	41.7	45.5	47.8	50.1	54.8	56.8	57.7	56.1	56.2	55.30996735
800	29.4	39.3	43.1	46.0	50.3	51.4	52.1	54.7	59.4	61.1	60.2571588
1000	29.3	35.8	39.6	42.2	44.1	48.0	50.4	51.3	53.6	52.9	51.989345
1250	36.1	44.2	43.2	46.6	49.4	53.4	54.1	56.1	57.8	59.2	58.35936158
1600	27.2	36.9	41.3	44.5	46.9	49.7	51.5	54.1	55.9	56.3	55.45323573
2000	25.7	38.3	41.2	44.7	48.2	51.5	53.2	55.3	57.6	58.3	57.444379
2500	21.9	37.1	40.1	42.8	45.6	49.0	50.6	53.1	55.1	55.8	54.96529909
3150	17.8	36.1	41.5	45.5	47.4	49.5	50.6	52.4	54.1	55.0	54.15285768
4000	13.4	34.4	39.8	44.5	49.6	52.7	53.2	53.9	54.6	54.8	53.88766288
5000	9.6	31.9	36.8	41.0	44.8	50.0	53.6	55.9	57.1	57.7	56.80544194
6300	8.2	29.5	34.5	38.5	42.4	45.8	48.4	51.4	54.5	56.4	55.52217267
8000	7.4	25.1	30.0	34.2	37.7	40.9	43.6	46.4	48.6	50.0	49.17191072
10000	6.1	20.8	25.6	30.0	33.5	36.5	38.9	41.4	43.5	45.1	44.26178578
12500	4.5	14.9	19.6	24.4	27.8	30.5	32.9	35.2	37.2	38.7	
16000	2.8	9.1	13.6	18.7	22.3	24.9	27.4	29.5	31.3	32.7	
	44.6	**52.8**	**55.0**	**57.6**	**62.0**	**62.4**	**64.2**	**66.4**	**67.8**	**68.5**	67.67193713

Tesla Megapacks - Battery Storage Unit Testing Data

Left				Rear				Right			
Duty	Ambient	100%	9-Fan Correction	Duty	Ambient	100%	9-Fan Correction	Duty	Ambient	100%	9-Fan Correction
Octave 1/3	dB(A)	dB(A)		Octave 1/3	dB(A)	dB(A)		Octave 1/3	dB(A)	dB(A)	
100	36.7	38.7	37.86756719	100	31.5	33.5	32.67647847	100	25.2	36.5	35.64437147
125	33.7	40.8	39.95451267	125	33.0	33.7	32.85998855	125	29.3	40.2	39.34196429
160	38.8	43.0	42.1449681	160	33.2	38.5	37.67830211	160	30.5	41.6	40.75967619
200	36.5	42.4	41.48563089	200	35.7	40.5	39.58017949	200	30.6	39.2	38.35541826
250	37.8	40.7	39.8214376	250	36.0	39.0	38.15988083	250	30.5	38.8	37.88911727
315	35.3	42.0	41.16412214	315	34.9	41.6	40.74869865	315	31.8	45.5	44.63503131
400	35.4	51.2	50.32506174	400	34.5	54.6	53.75900275	400	31.2	55.7	54.78999992
500	33.8	48.8	47.97321799	500	33.1	53.2	52.3460311	500	31.8	51.2	50.37725504
630	31.3	50.0	49.12798583	630	31.3	56.1	55.228006	630	32.7	52.7	51.79345847
800	31.6	54.0	53.17300536	800	30.5	59.8	58.92087641	800	29.0	56.8	55.88443448
1000	30.3	48.0	47.17366864	1000	29.5	51.2	50.34251527	1000	28.1	47.6	46.76664345
1250	32.8	53.8	52.92118174	1250	33.9	57.7	56.85970667	1250	31.1	54.5	53.59369964
1600	27.4	49.5	48.60130634	1600	26.2	55.5	54.62944564	1600	25.3	50.1	49.24539004
2000	24.4	50.2	49.31125247	2000	23.2	55.6	54.72943996	2000	25.1	49.9	49.06343789
2500	21.2	48.4	47.55878498	2500	18.6	54.1	53.19586509	2500	22.4	47.2	46.32235815
3150	17.3	45.5	44.62774057	3150	13.5	51.8	50.89457274	3150	18.2	44.5	43.59149995
4000	13.2	43.3	42.41656	4000	10.4	49.3	48.44188555	4000	14.5	41.7	40.80760654
5000	9.8	44.4	43.54324837	5000	8.9	50.6	49.71687791	5000	10.3	42.6	41.69108187
6300	8.0	40.9	40.05306493	6300	8.1	46.8	45.91416483	6300	8.2	36.8	35.92099018
8000	7.1	35.5	34.63873658	8000	7.3	41.2	40.33757767	8000	7.3	31.0	30.15619897
10000	5.9	29.5	28.58211505	10000	6.1	34.4	33.57015684	10000	6.0	24.0	23.13512697
12500	4.4	22.3		12500	4.6	26.7		12500	4.5	16.1	
16000	2.6	16.7		16000	2.8	20.7		16000	2.7	10.1	
	46.2	**61.2**	60.31404765		**44.4**	**66.0**	65.16980953		**41.6**	**62.8**	61.91463991

NEMA Standards Publication TR 1-2013 (R2019)

Transformers, Step Voltage Regulators and Reactors

Published by:

National Electrical Manufacturers Association
1300 North 17th Street, Suite 900
Rosslyn, VA 22209

Table 1
Audible Sound Levels for Oil-Immersed Power Transformers

Average Sound Level tt. Decibels	Equivalent Two-Winding Rating*																	
	350 kV BIL and Below			450, 550, 650 kV BIL			750 and 825 kV BIL			900 and 1050 kV BIL			1175 kV BIL			1300 kV BIL. and Above		
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
57	700																	
58	1000																	
59				700														
60	1500			1000														
61	2000																	
62	2500			1500														
63	3000			2000														
64	4000			2500														
65	5000			3000														
66	6000			4000			3000											
67	7500	6250▲▲		5000	3750▲▲		4000	3125▲▲										
68	10000	7500		6000	5000		5000	3750										
69	12500	9375		7500	6250		6000	5000										
70	15000	12500		10000	7500		7500	6250										
71	20000	16667		12500	9375		10000	7500										
72	25000	20000	20800	15000	12500		12500	9375										
73	30000	26667	25000	20000	16667		15000	12500		12500								
74	40000	33333	33333	25000	20000	20800	20000	16667		15000			12500					
75	50000	40000	41687	30000	26667	25000	25000	20000	20800	20000	16667		15000			12500		
76	60000	53333	50000	40000	33333	33333	30000	26667	25000	25000	20000	20800	20000	16667		15000		
77	80000	66687	66667	50000	40000	41667	40000	33333	33333	30000	26667	25000	25000	20000	20800	20000	16667	
78	100000	80000	83333	60000	53333	50000	50000	40000	41667	40000	33333	33333	30000	26667	25000	25000	20000	20800
79		106667	100000	80000	66667	66667	60000	53333	50000	50000	40000	41667	40000	33333	33333	30000	26667	25000
80		133333	133333	100000	80000	83333	80000	66667	66667	60000	53333	50000	50000	40000	41667	40000	33333	33333
81			166667		106667	100000	100000	80000	83333	80000	66667	66667	60000	53333	50000	50000	40000	41667
82			200000		133333	133333		106867	100000	100000	80000	83333	80000	66667	66667	60000	53333	50000
83			250000			166667		133333	133333		10686	100000	100000	80000	83333	80000	66667	68667
84			300000			200000			166667		13333	133333		106667	100000	100000	80000	83333
85			400000			250000			200000			166667		133333	133333		106667	100000
86						300000			250000			200000			166667		133333	133333
87						400000			300000			250000			200000			168667
88									400000			300000			250000			200000
89												400000			300000			250000
90															400000			300000
91																		400000

Column 1 • Class*ONAN. ONWN and OFWF Rating*
Column 2 • Class* ONAF and ODAF First stage Auxiliary Cooling"t
Column 3 • Straight OFAF Ratings, ONAF * and ODAF * Second stage Auxiliary Cooling"t'
Classes of cooling, see section 5.1 IEEE Std. C57.12-2010

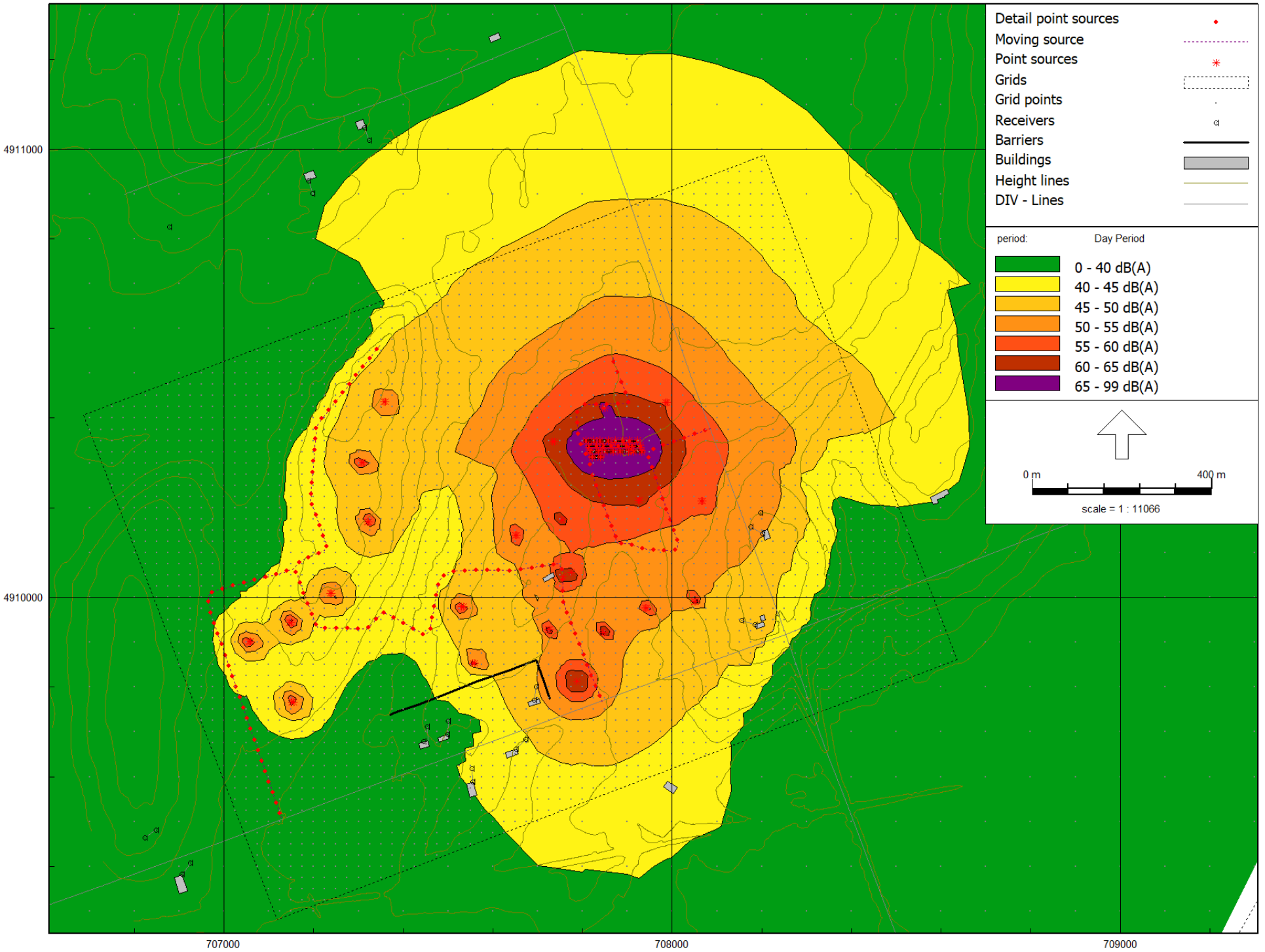
"First- and second stage auxiliary cooling, see section 4 Table 1 of IEEE Std. C57-12-2010
f For column 2 and 3 ratings, the sound levels are with the auxiliary cooling equipment in operation.
tf For intermediate kVA ratings, use the average sound level of the next larger kVA rating.
▲The equivalent two-winding 55ºC or 65ºC rating is defined as one-half the sum of the kVA rating of all windings
▲▲ Sixtv-seven decibels for all kVA ratings equal to this or smaller.

Table 2
Audible Sound Levels for Liquid-Immersed
Network Transformers and Step-Voltage Regulators

Equivalent Two-Winding kVA	Average Sound Level Decibels
0-50	48
51-100	51
101-300	55
301-500	56
501-750	57
751-1000	58
1001-1500	60
1501-2000	61
2001-2500	62
2501-3000	63

Appendix B

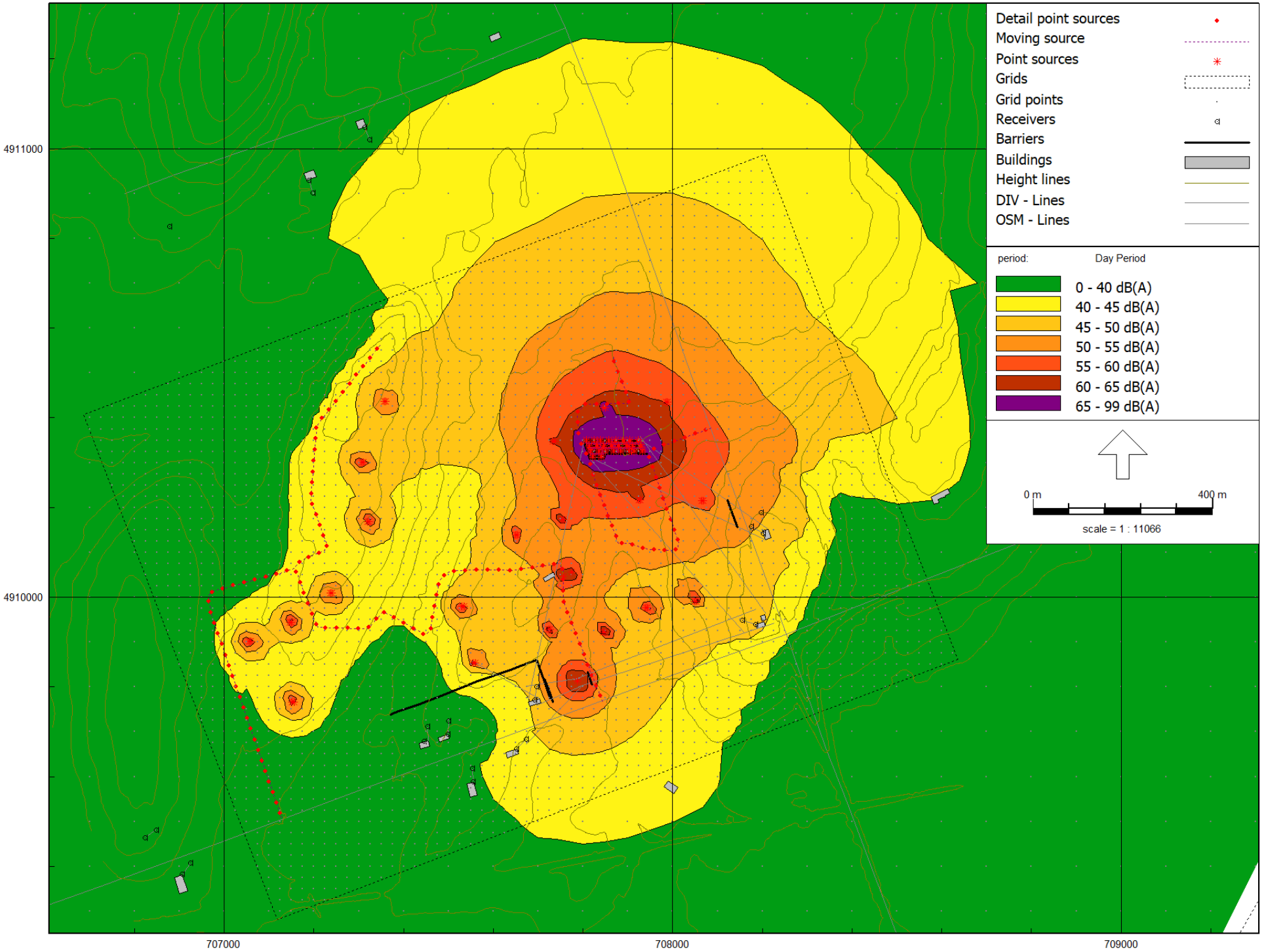
Impact Assessment Results



Steady

Cambium Inc., Canada

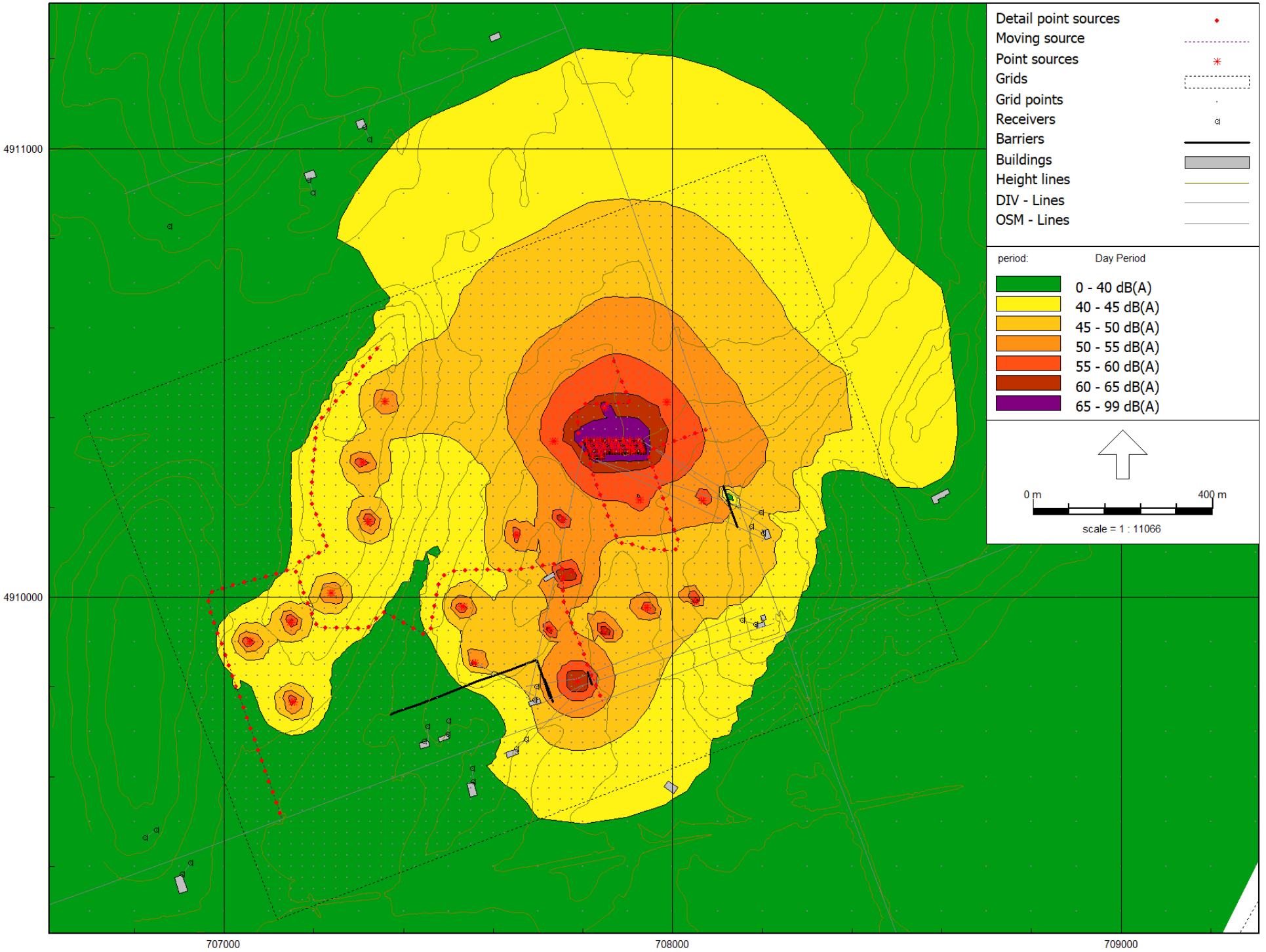
ISO 9613, [September 2023 - Steady] , Predictor V2023 Licensed to Cambium Inc., Canada



Steady - Mit

Cambium Inc., Canada

ISO 9613, [September 2023 - Steady - Mit] , Predictor V2023 Licensed to Cambium Inc., Canada



Steady - Mit_Vac

Cambium Inc., Canada

ISO 9613, [September 2023 - Steady - Mit_Vac_2] , Predictor V2023 Licensed to Cambium Inc., Canada

Appendix C

Traffic Data and ORNAMENT Outputs

County of Peterborough
Annual Average Daily Traffic

Section #	Description of County Road Section	Length	Units	AADT	Count Year	*Projected AADT (2018)	**Road Class	Truck %
011063	(Road) COUNTY ROAD 11 N.MONAGHAN, KINGS HIGHWAY 115-to-CITY OF PETERBOROUGH SOUTH LIMITS	0.8	km	5000	2016	5200	B	
012008	(Road) COUNTY ROAD 12 SMITH. LOT 12.CON 1/2.SMITH TWP.-to-LOTS 6/7.CON 1/2.SMITH TWP.	1.4	km	4500	2017	4600	B	3%
012039	(Road) COUNTY ROAD 12 SMITH, LOT 6/7,CON 1/2,SMITH TWP.-to-COUNTY ROAD 1	2.9	km	3100	2017	3150	B	3%
012068A	(Road) COUNTY ROAD 12 SMITH, COUNTY ROAD 1-TO-TINDLE BAY ROAD	1.2	km	1850	2017	1900	B	2%
012068B	(Road) COUNTY ROAD 12 SMITH, TINDLE BAY ROAD-to-218m EAST OF LOT 2/3 , CON 5	2.4	km	1150	2017	1150	B	2%
012104	(Road) COUNTY ROAD 12 SMITH, 218m EAST OF LOT 3/4, CON 5-to-218m EAST OF LOT 3/4, CON 5	1.5	km	200	2017	200	C	2%
014000	(Road) COUNTY ROAD 14 SMITH, COUNTY ROAD 18-to-COUNTY ROAD 16	1.44	km	11400	2017	11650	A	11%
014013	(Road) COUNTY ROAD 14 ENNISMORE, COUNTY ROAD 16-to-PETERBOROUGH/VICTORIA COUNTY BDRY.	5.4	km	5000	2017	5100	A	6%
015000	(Road) COUNTY ROAD 15 N.MONGHAN, BREALEY DRIVE-to-SCOTTS CORNERS - KINGS HWY 7A	3.1	km	5900	2016	6150	A	5%
016000	(Road) COUNTY ROAD 16 ENNISMORE, COUNTY ROAD 14-to-COUNTY ROAD 17	3.3	km	6800	2017	6950	A	4%
016031	(Road) COUNTY ROAD 16 ENNISMORE, COUNTY ROAD 17-to-END OF SUBURBAN SECTION,LOT 8	0.8	km	4975	2016	5200	A	5%
016039	(Road) COUNTY ROAD 16 ENNISMORE, ENNISMORE EAST LIMITS-to-ENNISMORE NORTH LIMITS	1	km	3150	2017	3200	B	5%
016048	(Road) COUNTY ROAD 16 ENNISMORE, ENNISMORE NORTH LIMITS-to-N.E.END OF GANNONS NARROWS CAUSEWAY	9.6	km	2900	2017	2950	B	3%
017000	(Road) COUNTY ROAD 17 ENNISMORE, COUNTY ROAD 16-to-6.4km N.E.,TO CENTRE LOT 14	6.4	km	1450	2017	1500	B	5%
018000	(Road) COUNTY ROAD 18 SMITH, PETERBORO NORTH CITY LIMITS-to-COUNTY ROAD 19	0.25	km	16900	2017	17250	A	3%
018003	(Road) COUNTY ROAD 18 SMITH, COUNTY ROAD 19-to-0.9 km NORTH OF COUNTY ROAD 19	0.9	km	16250	2017	16600	A	3%
018012	(Road) COUNTY ROAD 18 SMITH, 0.9 km NORTH OF COUNTY ROAD 19-to-COUNTY ROAD 1	0.97	km	15125	2016	15750	A	6%
018020	(Road) COUNTY ROAD 18 SMITH, COUNTY ROAD 1-to-BRIDGENORTH SOUTH LIMITS	3.48	km	14000	2017	14300	A	9%
018055	(Road) COUNTY ROAD 18 SMMITH, BRIDGENORTH		km	14150	2017	14450	A	13%
018066	(Road) COUNTY ROAD 18 SMITH, COUNTY ROAD 14-to-COUNTY ROAD 20	1.81	km	7750	2017	7900	A	9%
018084	(Road) COUNTY ROAD 18 SMITH, COUNTY ROAD 20-to-COUNTY ROAD 24	2.98	km	4050	2017	4150	B	6%
018115	(Road) COUNTY ROAD 18 SMITH, COUNTY ROAD 24-to-COUNTY ROAD 23	3.5	km	4500	2017	4600	B	6%
018148	(Road) COUNTY ROAD 18 SMITH, COUNTY ROAD 23-to-COUNTY ROAD 29	0.71	km	5900	2017	6000	B	9%
019000	(Road) COUNTY ROAD 19 SMITH, COUNTY ROAD 18-to-1.1km E.TO CITY LIMITS-HYDRO LINE	1.1	km	5450	2017	5550	B	8%
020000	(Road) COUNTY ROAD 20 SMITH, COUNTY ROAD 18-to-1.4 km NORTH OF COUNTY ROAD 18	1.35	km	3950	2017	4050	B	7%
020014	(Road) COUNTY ROAD 20 SMITH, 1.4 km NORTH OF COUNTY ROAD 18-to-LOTS 18/19, SMITH TWP.	3	km	3600	2016	3750	B	6%
020045	(Road) COUNTY ROAD 20 SMITH, LOTS 18/19,SMITH TWP.-to-COUNTY ROAD 23	4.64	km	3250	2017	3300	B	5%
020093	(Road) COUNTY ROAD 20 SMITH, COUNTY ROAD 23-to-COUNTY ROAD 25	5.77	km	1150	2017	1150	C	7%
020151	(Road) COUNTY ROAD 20 SMITH, COUNTY ROAD 25-to-0.35 m NORTH OF COUNTY ROAD 25	0.35	km	1475	2016	1550	B	7%
020155	(Road) COUNTY ROAD 20 SMITH, 0.35 m NORTH OF COUNTY ROAD 25-to-KINGS HIGHWAY 28	1.15	km	1800	2017	1850	B	6%
021000	(Road) COUNTY ROAD 21 CAVAN/MANVERS, KING`S HWY 115-to-CON. 4/5 CAVAN TOWNSHIP	0.2	km	600	2016	600	C	0%
021002	(Road) COUNTY ROAD 21 CAVAN, CON. 4/5 LOT 1,CAVAN-to-MILLBROOK WEST LIMITS AT QUEEN STR	6.2	km	1250	2016	1300	B	2%
021064	(Road) COUNTY ROAD 21 CAVAN, MILLBROOK WEST LIMITS AT QUEEN ST.-to-200 FT. WEST OF ANNE ST.	1.1	km	1350	2016	1400	B	4%
021075	(Road) COUNTY ROAD 21 MILLBROOK/CAVAN, 200 FT. WEST OF ANNE ST.-to-COUNTY ROAD 10 NORTH	0.3	km	1450	2016	1500	B	6%
021078	(Road) COUNTY ROAD 21 MILLBOOK/CAVAN, COUNTY ROAD 10 NORTH-to-MILLBROOK EAST LIMITS	0.6	km	1425	2016	1500	B	5%
021084	(Road) COUNTY ROAD 21 CAVAN, MILLBROOK EAST LIMITS-to-COUNTY ROAD 28	5.8	km	1400	2016	1450	B	4%
021142	(Road) COUNTY ROAD 21 S. MONAGHAN, COUNTY ROAD 28-to-WALLACE POINT BRIDGE	3.9	km	900	2016	950	C	5%
021181	(Road) COUNTY ROAD 21 OTONABEE, WALLACE POINT BRIDGE-to-STEWART HALL LOT 17,CON 15/16	5.9	km	800	2016	850	C	7%
021240	(Road) COUNTY ROAD 21 OTONABEE, STEWART HALL LOT17, CON 15/16-to-CITY OF PETERBOROUGH SOUTH LIMITS	3.27	km	1600	2016	1650	B	2%
022000	(Road) COUNTY ROAD 22 SMITH, N.LIMIT OF CURVE LAKE INDIAN RES.-to-COUNTY ROAD 23	4.2	km	3800	2017	3900	B	4%
023000	(Road) COUNTY ROAD 23 SMITH, COUNTY ROAD 29-to-COUNTY ROAD 18	2.46	km	3800	2017	3900	B	9%
023026	(Road) COUNTY ROAD 23 SMITH, COUNTY ROAD 18-to-1.8 km N SELWYN-COUNTY ROAD 20	7.6	km	5650	2017	5750	B	10%
023102	(Road) COUNTY ROAD 23 SMITH, 1.8 km N SEWYN-COUNTY ROAD 20-to-BUCKHORN SOUTH LIMITS	7.7	km	6000	2017	6100	B	13%
023179	(Road) COUNTY ROAD 23 SMITH, BUCKHORN SOUTH LIMITS-to-SOUTH JCT COUNTY ROAD 36	1.9	km	6550	2017	6700	A	11%
024000	(Road) COUNTY ROAD 24 SMITH, CITY OF PETERBOROUGH NORTH LIMITS-to-TWP. RD. BETWEEN CON.3/4 SMITH TWP	0.6	km	1657.5	2016	1700	B	5%
024006	(Road) COUNTY ROAD 24 SMITH, TWP. RD. BETWEEN CON.3/4 SMITH TWP-to-COUNTY ROAD 18	5.7	km	1800	2017	1850	B	3%
025000	(Road) COUNTY ROAD 25 SMITH, COUNTY ROAD 18-to-TWP. ROAD BETWEEN CON. 9/10	3.2	km	1700	2017	1750	B	7%
025032	(Road) COUNTY ROAD 25 SMITH, TWP. ROAD BETWEEN CON. 9/10 SMITH-to-TWP. ROAD - KATCHIWANO GOLF CLUB	1.8	km	1515	2016	1600	B	8%
025050	(Road) COUNTY ROAD 25 SMITH, TWP. ROAD KATCHIWANO GOLF CLUB-to-MILLER ROAD	1.6	km	950	2017	950	C	5%
025066	(Road) COUNTY ROAD 25 SMITH, MILLER ROAD-to-COUNTY ROAD 20	1.9	km	1325	2016	1400	B	8%
026000	(Road) COUNTY ROAD 26 EMILY, KINGS HIGHWAY 7 AT FOWLERS CORNERS-to-CON.5/6 EMILY TWP.VICTORIA CO.	3.5	km	3000	2016	3100	B	5%
027000	(Road) COUNTY ROAD 27(ACKISON RD.), COUNTY ROAD 3-to-1.0 km NORTH	1	km	5900	2016	6150	A	6%
028000	(Road) COUNTY ROAD 28 CAVAN, KING`S HWY 115-to-COUNTY ROAD 21 CAVAN	5.97	km	10000	2016	10400	A	10%

ROADWAY	ROAD ID	LOCATION (Between)	STATION NUMBER	COUNT DIRECTION	2018 Fall	2017 Fall			
115 Ramp	12109	North of Guthrie Dr.	*******	combined					
Aberdeen Ave.	10525	Chemong Rd. to Bethune St.	*******	combined					
Aberdeen Ave.	10985	Chemong Rd. to Chesterfield Ave.	*******	combined					
Ackinson Rd.	92405	Lily Lake Rd. to Parkhill Rd.	*******	combined	5589	5223			
Airport Rd.		Fisher Dr. & Brown 10th Line	*******	combined	5427	6049			
Airport Rd.	12464	Spillsbury Dr. to Fisher Dr.	*******	combined					
Airport Rd.		Spillsbury Dr. to SSF Dr.		combined	5394	6311			
Albert St.	11771	Alfred St. to Lafayette Ave.	*******	combined					
Albert St.		Alfred St. to Monaghan Rd.	*******	combined		2493			
Alexander Ave.	11105	Sherbrooke St. to Alexander Ct.	*******	combined					
Applegrove Ave.	10490	Chemong Rd. to Rosehill Dr.	*******	combined					
Applewood Cr.	10135	Kawartha Hts. Blvd. To Bankside Dr.	*******	combined					
Armour Rd.	11431	Douro St to Munroe	*******	combined					
Armour Rd.	11611	Frances Stewart Rd. to Cunningham Blvd	*******	combined	5177	5120			
Armour Rd.	11512	Hunter St. to Douro St.	*******	combined	5631	5849			
Armour Rd.	11511	Hunter St. to St. Luke's Ave.	*******	combined					
Armour Rd.	11435	McFarlane St. & Hazlitt St.	*******	combined	11089	10784			
Armour Rd.		McFarlane St. & Clifton St.	*******	combined					
Armour Rd.		Nassau Mills Rd. & Dafoe Dr.	*******	combined					
Armour Rd.	11518	Frances Stewart Rd. of Paddock Wood	*******	combined	7420	6058			
Armour Rd.	11516	Parkhill Rd. E. to Dunlop St.	*******	combined	10055	10032			
Armour Rd.	11584	Parkhill Rd. E. to Swanston Ave.	*******	combined	11163	10797			
Armour Rd.	11429	Maria St. to Sophia St.	*******	combined	3220	3197			
Armstrong Dr.	10874	Walkerfield Ave. to Hospital Dr.	*******	combined					
Armstrong Dr.	10452	Weller St. to Walkerfield Ave.	*******	combined					
Arndon Ave	10094	Monaghan Rd. to St. Catherine St.	*******	combined					
Arndon Ave	10643	Park St. to St. Catherine St.	*******	combined					
Ashburnham Dr.	11591	Corrigan Hill to #7 HWY	*******	combined					
Ashburnham Dr.	11969	Hunter St. to Old Norwood Rd.	*******	combined	4554	4459			
Ashburnham Dr.	12103	Lansdowne St. to Marsdale	*******	combined	16230	15278			
Ashburnham Dr.	11916	Maniece Ave to Hunter St.	*******	combined	5881	5525			
Ashburnham Dr.	11510	Marsdale Dr. to Maria St.	*******	combined	13448	12720			
Ashburnham Dr.		Maria St. & Maniece Ave.		combined					
Ashburnham Dr.	11680	Neal Dr. to City Limits	*******	combined	1688	1393			
Ashburnham Dr.	11509	North of Neal Dr.	*******	combined	8610	8167			
Ashburnham Dr.		Lansdowne St. E. to Corrigan Cres.	*******	combined	12926	13030			
Auburn St		Parkhill Rd E to Dunlop St	*******	combined	646				
Aylmer St.	10630	Antrim St. to Edinburgh St.	*******	combined					
Aylmer St.	11420	London St. to McDonnel St.	*******	combined		2913			
Aylmer St.	11551	McDonnel St. to Brock St.	*******	combined	6049	6021			
Aylmer St.	11418	Hunter St. W. to Brock St.	*******	combined					
Aylmer St.		Hunter St. W. to Simcoe St.	*******	combined	9736	8558			
Aylmer St.		Lansdowne St. W. to Prince St.	*******	combined	5388	5144			
Aylmer St.	11416	Simcoe St. to Charlotte St.	*******	combined					
Aylmer St.	11555	King St. to Charlotte St.	*******	combined	7590	8315			
Aylmer St.	11517	Sherbrooke St. to King St.	*******	combined	9378	8488			
Aylmer St.		Sherbrooke St. and Dalhousie St.		combined					
Aylmer St.	11413	Townsend St. to Rink St.	*******	combined					
Aylmer St.	12231	Lake St. to Wescott St.	*******	combined	6660	5785			
Barnardo Ave.	12022	Clark Dr. to St. Paul's St.	*******	combined					
Barnardo Ave.	12018	George St. to Churchill Dr.	*******	combined		4727			
Barnardo Ave.	11887	Bennet St. & Bellevue St.	*******	combined					
Barnardo Ave.		Water St. to George St. N.	*******	combined					
Barnardo Ave.		Bellevue St. to McClennan St.	*******	combined					
Barnardo Ave.		McClennan St. to Hartley St.	*******	combined		5052			
Bellevue St.	10523	Benson Ave. to Aylmer St.	*******	combined					
Bellevue St.		Chemong Rd. to Timothy St.	*******	combined	3356	3045			
Bennet St.	10378	Chemong Rd. to Aylmer St.	*******	combined					
Bensfort Rd.	12483	Neal Dr. to City Limits	*******	combined	5054	4235			
Bensfort Rd.	11426	By-Pass and Guthrie	*******	combined	7945	7521			
Bensfort Rd.	11427	Collison Ave. to Riverview Heights	*******	combined	6741	6815			
Bensfort Rd.	11425	Guthrie Dr. & Neal Dr.	*******	combined					
Bensfort Rd.	12237	Ottonabee Dr. to Kennedy Rd.	*******	combined					
Benson Ave.	10306	Parkhill Rd. W. to Kingan St.	*******	combined					
Bethune St.	12141	Antrim St. to Edinburgh St.	*******	combined					
Bethune St.	11393	McDonnel St. to London St.	*******	combined					
Bethune St.	11392	Murray St. to Brock St.	*******	combined					
Bonaccord St.	10370	Park St. to Cordach Cr.	*******	combined					
Bonaccord St.	11635	Monaghan Rd. to Cordach Cr	*******	combined					
Braidwood Ave.	11907	Park St. to Herman St.	*******	combined					
Braidwood Ave.		St. Catherine St. to Epgrave Blvd.	*******	combined	2395				
Braidwood Ave.	11903	Monaghan Rd. to St. Catherine St.	*******	combined		2484			
Brealey Dr.	11613	Forster Ave. to Lansdowne St.	*******	combined	10564	11748			
Brealey Dr.	11581	Forster Ave. to Stenson Blvd.	*******	combined					
Brealey Dr.	11293	Ireland Dr. to Parkhill Rd. W.	*******	combined	6401	6868			
Brealey Dr.		Glenforest Blvd. to Ireland Dr.	*******	combined					
Brealey Dr.		Hewitt Dr. to Sherbrooke St.	*******	combined	10326	9740			
Brealey Dr.	11295	Kawartha Hts. Blvd. To Hewitt Dr.	*******	combined					

High St.	12092	Lansdowne St. to St. Mary's St.	*******	combined	5973	6348			
High St.		Lansdowne St. to Lansdowne Place Entranc	*******	combined					
High St.		Sherbrooke St. & Maryland Ave.		combined	3945	3380			
High St.	12010	Third Ave. to Brunswick Ave.	*******	combined	3426	3542			
Highland Rd.	11722	Donegal St. to Applegrove Ave	*******	combined					
Highland Rd.		Fairbairn St. to Highland Ct.		combined					
Highland Rd.		Chemong Rd. to Applegrove Ave.	*******	combined	3430	3403			
Hilliard St.	11679	Cumberland Ave to City Limits	*******	combined	4216	3963			
Hilliard St.	11573	Franklin Dr. to Cumberland Ave.	*******	combined					
Hilliard St.	11565	George St. N. to Anson St.	*******	combined		6574			
Hilliard St.	11570	Langton St. to Philip St.	*******	combined					
Hilliard St.	11568	Marina Bvld to Oriole Dr.	*******	combined					
Hilliard St.		Marina Blvd. & St. Paul's St.		combined					
Hilliard St.	11641	McClennan St. & Dutton Rd.	*******	combined					
Hilliard St.	11422	Normandy St. to Franklin Dr.	*******	combined					
Hilliard St.	11572	Normandy St. to TowerHill Rd.	*******	combined					
Hilliard St.	11610	Towerhill Rd. to St. Paul St.	*******	combined					
Hilliard St.		Water St. & George St.		combined					
Hilliard St.		Rishor St. to McLennan	*******	combined					
Hopkins Ave.	11049	Monaghan Rd. to Thompson Ave	*******	combined					
Hopkins Ave.	10613	Monaghan Rd. to Park St.	*******	combined					
Hospital Dr.	12101	Armstrong Dr. to Alexander Crt.	*******	combined					
Hospital Dr.		Medical Dr. & Dobbin Ave.		combined	2661	3412			
Hospital Dr.		Medical Dr. & Weller St.		combined	3682	5324			
Hunter St.	12295	Burnham St. to Sheridan St.	*******	combined	15511	16204			
Hunter St.		Burnham St. & Driscoll Terr.		combined					
Hunter St.	11453	Queen St. to Sheridan St.	*******	combined					
Hunter St.	11455	Driscoll Terr. & Mark St.	*******	combined		10540			
Hunter St.	11456	Mark St to Rogers St	*******	combined	8988	8867			
Hunter St.	11457	Rogers St to Armour Rd	*******	combined	5821	6015			
Hunter St.		Rubidge St. & Stewart St.		combined					
Hunter St.	11451	George St. to Aylmer St.	*******	combined	9037	7693			
Hunter St.		George St. & Water St.		combined	9558	9954			
Hunter St.	11458	Armour Rd. to Ashburnham Dr.	*******	combined	3315	3333			
Hunter St.		Armour Rd. to Museum Dr.	*******	combined					
Ireland Dr.	12440	Brealey Dr. to Matthews Crt.	*******	combined					
Ireland Dr.		Haggis Dr and Bianco Cres	*******	combined	1822				
Ireland Dr.	12416	Ravenwood Dr. to Amy's Ct.	*******	combined					
Johnston Dr.	12251	Crawford Dr. to Highway 115	*******	combined	703	679			
Kawartha Hts. Blvd.	11993	Bayleaf Ct. to Woodglade Blvd.	*******	combined					
Kawartha Hts. Blvd.	11995	Brealey Dr. to Sumac St.	*******	combined					
Kawartha Hts. Blvd.		Lansdowne St. W. & Applewood Cres.	*******	combined	8019	7689			
Kawartha Hts. Blvd.	11987	Springbrook Dr. to Ferndale Ave.	*******	combined					
Kawartha Hts. Blvd.	11994	Woodglade Blvd. To Wintergreen Tl.	*******	combined	2734				
Keene Rd.	10725	Lansdowne St. to Television Rd.	*******	combined	3926	3815			
Kennedy Rd.	10022	Bensfort Rd. to the 115 On-Off Ramp	*******	combined	4078	3997			
King St.		Monaghan Rd to Park St.	*******	combined	681				
King St.		Reid St. to Rubidge St.	*******	combined	2225				
King St.	10249	George St. to Louis St.	*******	combined	2810	2715			
Lake St.		Aylmer St. & George St.	*******	combined		603			
Langton St.	10324	Hilliard St. to Water St.	*******	combined		1294			
Lansdowne St.	11671	Applewood Cres. & Brealey Dr.	*******	combined	17726	18725			
Lansdowne St.	12131	Ashburnham Dr. to River Rd. S.	*******	combined	17547	18325			
Lansdowne St.		Ashburnham Dr to Willowcreek Blvd.	*******	combined					
Lansdowne St.	12241	Aylmer St. to George St.	*******	combined	23061	23199			
Lansdowne St.	11309	Clonsilla Ave. to Canadian Tire	*******	combined					
Lansdowne St.	11309	Canadian Tire to Webber Ave.	*******	combined	22700	18055			
Lansdowne St.	12475	Clonsilla Ave. to Spillsbury Dr.	*******	combined	26031	25486			
Lansdowne St.	12420	Ashburnham Dr. to Consumers Pl.	*******	combined	19313	18495			
Lansdowne St.		Ford St. & High St.		combined	24470	23670			
Lansdowne St.		Goodfellow Rd. & Wightman Ave.		combined	22360	24086			
Lansdowne St.		Goodfellow Rd. to The Parkway	*******	combined					
Lansdowne St.	11582	High St. to Erskine Ave.	*******	combined					
Lansdowne St.		Kawartha Hts. Blvd. to Village Cres.							
Lansdowne St.	11316	Lock St. & Sherburne St.	*******	combined					
Lansdowne St.	11068	Lock St. to George St.	*******	combined					
Lansdowne St.		Lock St. to Maude St.	*******	combined	22072	21464			
Lansdowne St.	11196	Monaghan Rd. & Park St.	*******	combined	26865	26347			
Lansdowne St.	11314	Monaghan Rd. to High St.	*******	combined	26255	23364			
Lansdowne St.	12069	Park & Aylmer	*******	combined	25009	24744			
Lansdowne St.	11558	River Rd. S. to Edwards St.	*******	combined	25890	25401			
Lansdowne St.	12065	Rye St. to Webber Ave.	*******	combined					
Lansdowne St.	11583	Television Rd to Willowcreek Blvd	*******	combined	15461	15287			
Lansdowne St.	11310	The Parkway to Arthur Ave.	*******	combined	24717	24086			
Lansdowne St.		The Parkway & Rye St.	*******	combined	24323	25763			
Lansdowne St.	12482	Westridge Blvd to City Limits	*******	combined	9781	9948			
Lansdowne St.		Westridge Blvd. & Dobbin Rd.		combined					
Lansdowne St.	93270	Brealey Dr. to Dobbin Rd.	*******	combined	17200	17899			
Leahy's Ln		Parkhill Rd E to Garside Dr	*******	combined	1023				
Lily Lake Rd.	92407	Eastwood Rd. to Fairbairn St.	*******	combined	5100	4607			

STAMSON 5.0 NORMAL REPORT Date: 11-12-2023 13:13:49
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: c1d.te Time Period: 1 hours
Description: C1D

Road data, segment # 1: Fife Bay

Car traffic volume : 154 veh/TimePeriod
Medium truck volume : 3 veh/TimePeriod
Heavy truck volume : 2 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Fife Bay

Angle1 Angle2 : -80.00 deg 80.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 30.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑
Results segment # 1: Fife Bay

Source height = 1.06 m

ROAD (0.00 + 52.41 + 0.00) = 52.41 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-80	80	0.66	58.99	0.00	-5.00	-1.59	0.00	0.00	0.00	52.41

Segment Leq : 52.41 dBA

Total Leq All Segments: 52.41 dBA

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TOTAL Leq FROM ALL SOURCES: 52.41
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STAMSON 5.0 NORMAL REPORT Date: 11-12-2023 13:14:13
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: c1e.te Time Period: 1 hours
Description: C1E

Road data, segment # 1: Fife Bay

Car traffic volume : 51 veh/TimePeriod
Medium truck volume : 1 veh/TimePeriod
Heavy truck volume : 1 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Fife Bay

Angle1 Angle2 : -80.00 deg 80.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 30.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↟
Results segment # 1: Fife Bay

Source height = 1.17 m

ROAD (0.00 + 48.29 + 0.00) = 48.29 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-80	80	0.66	54.88	0.00	-5.00	-1.59	0.00	0.00	0.00	48.29

Segment Leq : 48.29 dBA

Total Leq All Segments: 48.29 dBA

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TOTAL Leq FROM ALL SOURCES: 48.29
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STAMSON 5.0 NORMAL REPORT Date: 11-12-2023 13:00:23
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: c3d.te Time Period: 1 hours
Description: C3D

Road data, segment # 1: Fife Bay

Car traffic volume : 154 veh/TimePeriod
Medium truck volume : 3 veh/TimePeriod
Heavy truck volume : 2 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Fife Bay

Angle1 Angle2 : -80.00 deg 10.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 55.00 m
Receiver height : 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↟
Road data, segment # 2: Lily Lake

Car traffic volume : 250 veh/TimePeriod
Medium truck volume : 5 veh/TimePeriod
Heavy truck volume : 3 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: Lily Lake

Angle1 Angle2 : -10.00 deg 80.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 45.00 m
Receiver height : 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↟
Results segment # 1: Fife Bay

Source height = 1.06 m

ROAD (0.00 + 46.20 + 0.00) = 46.20 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-80	10	0.58	58.99	0.00	-8.93	-3.86	0.00	0.00	0.00	46.20

Segment Leq : 46.20 dBA

↟

Results segment # 2: Lily Lake

Source height = 1.04 m

ROAD (0.00 + 49.58 + 0.00) = 49.58 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-10	80	0.58	61.00	0.00	-7.56	-3.86	0.00	0.00	0.00	49.58

Segment Leq : 49.58 dBA

Total Leq All Segments: 51.22 dBA

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TOTAL Leq FROM ALL SOURCES: 51.22

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STAMSON 5.0 NORMAL REPORT Date: 11-12-2023 13:00:57
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: c3e.te Time Period: 1 hours
Description: C3E

Road data, segment # 1: Fife Bay

Car traffic volume : 51 veh/TimePeriod
Medium truck volume : 1 veh/TimePeriod
Heavy truck volume : 1 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Fife Bay

Angle1 Angle2 : -80.00 deg 10.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 55.00 m
Receiver height : 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↟
Road data, segment # 2: Lily Lake

Car traffic volume : 83 veh/TimePeriod
Medium truck volume : 2 veh/TimePeriod
Heavy truck volume : 1 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: Lily Lake

Angle1 Angle2 : -10.00 deg 80.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 45.00 m
Receiver height : 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↟
Results segment # 1: Fife Bay

Source height = 1.17 m

ROAD (0.00 + 42.11 + 0.00) = 42.11 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-80	10	0.58	54.88	0.00	-8.91	-3.86	0.00	0.00	0.00	42.11

Segment Leq : 42.11 dBA

↟

Results segment # 2: Lily Lake

Source height = 1.04 m

ROAD (0.00 + 44.93 + 0.00) = 44.93 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-10	80	0.58	56.34	0.00	-7.56	-3.86	0.00	0.00	0.00	44.93

Segment Leq : 44.93 dBA

Total Leq All Segments: 46.76 dBA

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TOTAL Leq FROM ALL SOURCES: 46.76

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STAMSON 5.0 NORMAL REPORT Date: 27-10-2023 12:21:39
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: c5d.te Time Period: 1 hours
Description: C5D

Road data, segment # 1: Lily Lake

Car traffic volume : 250 veh/TimePeriod
Medium truck volume : 5 veh/TimePeriod
Heavy truck volume : 3 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Lily Lake

Angle1 Angle2 : -80.00 deg 80.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 85.00 m
Receiver height : 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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Results segment # 1: Lily Lake

Source height = 1.04 m

ROAD (0.00 + 47.59 + 0.00) = 47.59 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-80	80	0.58	61.00	0.00	-11.93	-1.48	0.00	0.00	0.00	47.59

Segment Leq : 47.59 dBA

Total Leq All Segments: 47.59 dBA

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TOTAL Leq FROM ALL SOURCES: 47.59
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STAMSON 5.0 NORMAL REPORT Date: 27-10-2023 12:22:47
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: c5e.te Time Period: 1 hours
Description: C5E

Road data, segment # 1: Lily Lake

Car traffic volume : 83 veh/TimePeriod
Medium truck volume : 2 veh/TimePeriod
Heavy truck volume : 1 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Lily Lake

Angle1 Angle2 : -80.00 deg 80.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 75.00 m
Receiver height : 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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Results segment # 1: Lily Lake

Source height = 1.04 m

ROAD (0.00 + 43.79 + 0.00) = 43.79 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-80	80	0.58	56.34	0.00	-11.07	-1.48	0.00	0.00	0.00	43.79

Segment Leq : 43.79 dBA

Total Leq All Segments: 43.79 dBA

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TOTAL Leq FROM ALL SOURCES: 43.79
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STAMSON 5.0 NORMAL REPORT Date: 11-12-2023 13:12:54
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: c14d.te Time Period: 1 hours
Description: C14D

Road data, segment # 1: Fife Bay

Car traffic volume : 154 veh/TimePeriod
Medium truck volume : 3 veh/TimePeriod
Heavy truck volume : 2 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Fife Bay

Angle1 Angle2 : -80.00 deg 80.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 30.00 m
Receiver height : 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑
Results segment # 1: Fife Bay

Source height = 1.06 m

ROAD (0.00 + 52.75 + 0.00) = 52.75 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-80	80	0.58	58.99	0.00	-4.77	-1.48	0.00	0.00	0.00	52.75

Segment Leq : 52.75 dBA

Total Leq All Segments: 52.75 dBA

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TOTAL Leq FROM ALL SOURCES: 52.75
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STAMSON 5.0 NORMAL REPORT Date: 11-12-2023 13:13:19
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: c14e.te Time Period: 1 hours
Description: C14E

Road data, segment # 1: Fife Bay

Car traffic volume : 51 veh/TimePeriod
Medium truck volume : 1 veh/TimePeriod
Heavy truck volume : 1 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Fife Bay

Angle1 Angle2 : -80.00 deg 80.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 30.00 m
Receiver height : 4.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

↑
Results segment # 1: Fife Bay

Source height = 1.17 m

ROAD (0.00 + 48.65 + 0.00) = 48.65 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-80	80	0.58	54.88	0.00	-4.76	-1.47	0.00	0.00	0.00	48.65

Segment Leq : 48.65 dBA

Total Leq All Segments: 48.65 dBA

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TOTAL Leq FROM ALL SOURCES: 48.65
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