Environmental Noise Study
Whistle Bare Campground Expansion
1898 Whistle Bare Road
Cambridge, ON

Novus/SLR Reference No. 241.19176.00000 Version No. 2 (Final) December 6, 2019

PROJECT TEAM:

Scientist:	Jason Dorssers, B.Eng.
Project Engineer:	Aaron Haniff, P.Eng.
Project Manager:	R.L. Scott Penton, P.Eng.

This page intentionally left blank
for 2-sided printing purposes

Table of Contents

List of Tables

List of Figures

List of Appendices

1.0 Introduction

Novus Environmental Inc. (Novus) now a part of SLR Consulting was retained by GSP Group Inc. on behalf of Whistle Bare Campground (Whistle Bare), to conduct an Environmental Noise Study for the future expansion of Whistle Bare Campground located at 1898 Whistle Bare Road in Cambridge, Ontario.

1.1 Focus of Report

In keeping with the Regional Municipality of Waterloo and the Ontario Ministry of the Environment and Climate Change requirements, this report examines the potential for:

- Impacts of the environment on the proposed development;
- Impacts of the proposed development on itself; and
- Impacts of the proposed development on the surrounding environment.

In accordance with the Ministry of the Environment, Conservation and Parks (MECP) Publication NPC-300, and in the context of a stationary noise assessment, the proposed development contains campsites which are considered “points of reception” for impact assessments of stationary sources.

1.2 Nature of the Subject Lands

The development lands are located on the north side of Whistle Bare Road in Cambridge, to the east of Provincial Highway 401 between the Homer Watson Boulevard and Cedar Creek Road exits.

Currently, the Whistle Bare Campground site at 1898 Whistle Bare Road contains a (2) two-storey office/residence, a large barn, a storage space, and 82 seasonal campground sites with amentities. Proposed plans are to expand the campground southwards towards the road with an additional 361 sites. Existing campsites will be revised to achieve a more efficient layout. An overall context plan of the site is provided in **Figure 1**. A copy of the site plan is provided in **Appendix A**. The designated area for new campsite expansion is shown in detail in **Figure 2**.

1.3 Nature of the Surroundings

The Whistle Bare Campground site is located in a rural area of Cambridge, which includes mostly industrial, and agricultural lands with scattered residential homes. There are two sites with active Aggregate Resources Act (“ARA”) licences within 1000m of the site. Both sites are typically treated by the Ministry of Environment, Conservation & Parks (“MECP”) Guideline D-6 as “Class III” heavy industries. The site to the west/south-west is Grower’s Choice, which specializes in production and disturbution of materials including mulches, and soils. To the

south-east, the second ARA pit "Whistle Bare Pit #3" is owned by Capital Paving Incorporated.

The adjacent areas surrounding the site is generally composed of agricultural lands. There are residences situated along Whistle Bare Road ranging from the west end to the east. One dwelling was noted during the site visit at 1960 Whistle Bare Road, which was not shown in aerial imagery. North of the site, there is dense brush with agricultural lands and residences situated throughout. To the east of the proposed development is the Whistle Bare Golf Club and a trailer rental service.

Part 1: Impacts of the Environment on the Development

In assessing the potential impacts of the environment on the proposed development, the focus of this report is to assess the potential for transportation noise impacts from Highway 401 and Whistle Bare Road.

No blasting or vibration-intensive operations are involved with the surrounding pit/quarry sites. Therefore, a vibration assessment is not required.

2.0 Transportation Noise Impacts

Noise impacts from transportation sources were investigated in detail. The major transportation noise sources of interest with the potential to produce noise at the proposed development are Highway 401 and Whistle Bare Road. The Dickie Settlement Road is expected to have minor noise contributions due to screening effects from buildings and topography changes, and therefore not included in this study.

Sound exposure levels at the development due to these sources have been predicted, and this information has been used to identify requirements for potential mitigation at surrounding facilities.

2.1 Traffic Data and Future Projections

2.1.1 Roadway Traffic Data

Forecasted AADT data for Whistle Bare Road were obtained directly from the Regional Municipality of Waterloo Transportation Services. Data for Provincial Highway 401 was obtained from the Ministry of Transportation website, through the Ontario Provincial Highways Traffic Volumes on Demand page. Copies of all traffic data used can be found in **Appendix B**. The following **Table 1** summarizes the road traffic volumes used in the analysis.

Commercial traffic breakdowns (medium/heavy trucks) were provided by the Regional Municipality of Waterloo for Whistle Bare Road. Medium/Heavy percentages were assumed based on historical data for highways for Highway 401.

Table 1: Summary for Road Traffic Data Used in the Transportation Noise Analysis

Roadway Link	2029 Levels (AADT)	# of Lanes	Day/Night Volume Split		Commercial Traffic Breakdown		Vehicle Speed (km/h)
			Day	Night	% Medium Trucks	% Heavy Trucks	
Whistle Bare Road (West Leg)	9600	2	90[1]	10[1]	1.2	16.3	80
Whistle Bare Road (North Leg)	700	2	90[1]	10[1]	2.2	20.3	80
Highway 401	60205	6	68	32	5.0	15.0	100

Notes: [1] The Day/Night split was assumed to be 90/10, based on information previously provided by the Regional Municipality of Waterloo.

2.2 Projected Sound Levels

Traffic sound levels at the proposed development were predicted using Cadna/A, a commercially available noise propagation modelling software. Roadways were modelled as line sources of sound, with sound emission rates calculated using ORNAMENT algorithms, the road traffic noise model of the MECP. These predictions are equivalent to those made using the MECP's ORNAMENT, RT/Custom or STAMSON v5.04 road traffic noise models.

Sound levels were predicted at the property lines of the proposed development using the "calculation grid" feature of Cadna/A. This feature allows for noise levels to be predicted across an entire area of influence. An example of a calculation grid result is shown in **Figure 3.** The worst-case for each area was established, a single receptor was used to predict the sound level for the property. Predicted impacts at the property due to transportation sources are presented in **Table 2** and shown in **Figure 4**.

For this assessment, a mixture of hard and soft ground absorption factors were applied, ranging from 0 in hard reflective areas (roadways, ARA areas) to 1 in absorptive spaces (foliage, farmland).

Changes in ground elevation were included in the modelling using topography from the Regional Municipality of Waterloo Open Data.

Table 2: Summary of Transportation Façade Sound Levels

Scenario	Receptor	Roadway Sound Levels	
		L_{eq} Day (dBA)	L_{eq} Night (dBA)
Current Worst-Case	R1	71	71
Future Worst-Case	R2	64	64

Notes: Locations of assumed worst-case points of reception are shown in **Figure 3** and **Figure 4** based on calculation grid results.

The future property sound levels at the proposed addition to the campground are predicted to be below the existing conditions at the current site during the daytime and night-time periods. Due to the development moving farther from the Highway 401, newer campsites will experience less roadway noise. Therefore additional mitigation is not required for transportation noise impacts.

Figure C1 found in **Appendix C** summarizes a comparison of the Cadna/A implementation and STAMSON modelling at one (1) location on the property, where results are within 1.0 dBA of each other. All required STAMSON modelling output files are attached in **Appendix C**.

3.0 Stationary Source Noise Impacts

A review has been conducted for the potential impacts on the development from stationary commercial/industrial noise sources.

Novus/SLR staff completed a site visit on August 16th, 2019 to the development lands and surrounding area. The purpose of the site visit was to identify local industries (including the ARA sites) and surrounding properties, and to understand the potential for noise impacts on the proposed development. The site was found to be primarily surrounded by industrial lands but had residential areas scattered throughout. Along Whistle Bare Road, multiple residences were noted including 1960 Whistle Bare Road, which is located to the west of the proposed campground, closer to Grower's Choice lands.

Novus/SLR staff met with Grower's Choice staff on-site to discuss operations at the ARA pits located at 1951 Whistle Bare Road. To the north, across the street from 1951 Whistle Bare, is a dump-site used by Grower's Choice for storage of materials like mulch and gravel. At the 1951 site, multiple stationary sources were noted including front-end loaders, and a large wood tub grinder. Grower's staff informed Novus that multiple haul trucks would be operating on site. Trucks arrive with product to be processed into ditributable material. This material is then shipped by trucks for off-site use.

Novus/SLR staff also met with workers at Whistle Bare Pit #3 to discuss pit operations at 1196 Dickie Settlement Road. Capital Paving uses the site as storage for various aggregate materials such as gravel, stone, and, mulches. Novus/SLR was informed that the site will no longer be in operation in the future and rarely used presently.

Surrounding local businesses/industries considered in this assessment are shown in **Figure 1**.

3.1 Stationary Noise Modelling

Noise impacts from stationary noise sources were modelled using Cadna/A, a software implementation of the internationally recognized ISO-9613-2 environmental noise propagation algorithms. Cadna/A / ISO-9613 is the preferred noise model of the MECP. The model accounts for source noise emission levels, distance, screening effects from buildings, noise barriers, ground absorption, reflections from surrounding buildings, atmospheric absorption, and worst-case meteorological conditions.

3.2 Stationary Noise Criteria

3.2.1 MECP NPC-300 Guidelines for Stationary Noise Sources

MECP noise guidelines for stationary source noise impacting residential developments are given in MECP publication NPC-300. The applicable portions of NPC-300 are Part C – Land Use Planning and the associated definitions outlined in Part A Background.

The acoustic environment surrounding the proposed development is dominated by the roadway noise from both Whistle Bare Road and Highway 401 during all periods of the day. Therefore, the proposed development is considered to be located in a Class 1 area, and an assessment of impacts was completed for the daytime/evening (0700h to 2300h) and night-time (2300h to 0700h) periods.

The sound level limit for steady sound sources are expressed as a 1-hr equivalent sound level (1-hr L_{eq}), and is the higher of the NPC-300 exclusionary limits and the existing background sound level (from roadways). The NPC-300 stationary source noise requirements in a Class 1 Area are summarized in **Table 3** steady sound sources.

Table 3: NPC-300 Class 1 Continuous Sound Noise Requirements

Receiver Category	Time Period	Exclusionary Sound Level Limits, 1h-L_{eq} (dBA) [1]
Outdoor	0700-1900h	50
	1900-2300h	50
	2300-0700h	-
Plane of Window [2]	0700-1900h	50
	1900-2300h	50
	2300-0700h	45

Notes: [1] **or minimum hourly L_{eq} of background noise, whichever is higher**
[2] Applicable for "Noise Sensitive Spaces", as defined in NPC-300.

Since the ambient roadway sound levels were anticipated to be greater than the NPC-300 exclusionary limits, sound exposures from ambient roadway noise were assessed and the corresponding applicable guideline limits were determined.

Error! Reference source not found. summarizes the current road traffic volumes applied in the ambient noise modelling. Worst-case sound levels on the property are shown in **Figure 5**.

Table 4: Summary of Road Traffic Data - Ambient

Roadway Link	Existing Volume (AADT)	Worst-Case Hour for Day / Eve / Night [2]			Commercial Traffic Breakdown		Vehicle Speed (km/h)
		Day (%)	Eve (%)	Night (%)	Med (%)	Heavy (%)	
Whistle Bare Road (West Link)	9600 [1]	4.3	3.1	0.4	2.2	20.3	80
Whistle Bare Road (North Link)	700 [1]	4.3	3.1	0.4	1.2	16.3	80
Highway 401	60205	4.2	4.2	4.2	5.0	15.0	100

Notes: [1] Taken from traffic data provided by RMOW.
[2] Based on hourly breakdowns from historial Novus/SLR traffic data for arterial roadways and highways.

Ambient roadway noise was modelled as line sources of sound using the Cadna/A computer model. The minimum hourly L_{eq} for the ambient sound levels were found to be greater than the NPC-300 default guideline limits during all periods of the day. The minimum hours assessed for ambient sound levels were 11:00PM (day/evening), and 4:00AM (night).

The stationary noise impacts on the property were assessed against the maximum value of ambient traffic conditions or NPC-300 Guideline Limits.

Table 5: Property Sound Levels - Surrounding Stationary

Noise-Sensitive Property	Receptor	Ambient Sound Levels (dBA)	
		Day/Evening (0700-2300h)	Night (2300-0700h)
Current Worst-Case [1]	R1	70	67
Future Worst-Case [1]	R2	63	60
Residence at Whistle Bare Campground	R3	60	57
1960 Whistle Bare Road [2]	R4	63	58
2028 Whistle Bare Road [2]	R5	72	68

Notes: [1] Sound Levels shown represent the worst-case impact on all of the property.
[2] Using the "building evaluation" feature in Cadna/A provides the worst-case sound level on all facades of the residencs.

3.3 Modelled Stationary Sources

A summary of the sound power levels used in the assessment is included in **Table 6**. Locations for each source modelled are shown in **Figure 6**. All sources modelled were assumed to be in operation during the daytime periods only, as indicuated by staff members at Grower's Choice. Specifics related to operations for each modelled component is detailed in **Table 6**.

Table 6: Summary of Sound Power Levels

Description	Continuous or Impulsive	Sound Power Level (dBA)	Comments
Heavy Truck Activity	Continuous	101	• Based on maximum (L_{max}) pass-by levels taken from a similar engine • Assuming 15 trucks/hr • Loaded vehicle moving at 10 km/h • 900m route around property assumed (see **Figure 6**) • Daytime-Evening operations only (0700-2300h)
Front-End Loaders	Continuous	106	• Based on historical measurement data • Assumed 3 loaders in operations at various locations • Daytime-Evening operations only (0700-2300h) • Assumed to operate 30min/hr during daytime and evening
Bulldozer Activity	Continuous	105	• Based on historical measurement data • Assumed to operate continuously during daytime/evening • 41,000m^2 operation area (see **Figure 6**) • Daytime-Evening operations only (0700-2300h)
Wood Tub Grinder	Continuous	108	• Based on historial measurement data • Assumed single stationary source • Daytime-Evening operations only (0700-2300h) • Assumed to operate 1 hour/day during daytime and evening

3.4 Stationary Source Sound Levels

Similar to **Section 2.3**, the projected sound levels at the surrounding developments were modelled using Cadna/A software. In **Figure 7**, the calculation grid results for stationary source impacts on the property are shown for the future worst-case campsite (Receptor R6). Shown in **Table 7** are the resulting sound levels at the noise-sensitive receptors due to surrounding stationary activities. The receiver sound levels on the property and at surrounding sensitive receptors (1960 and 2028 Whistle Bare Road) are shown in **Figure 8** for the daytime impacts. Detailed information regarding the sound levels used in the Cadna/A modelling software are included in **Appendix D**.

Table 7: Stationary Sound Levels at Surrounding Noise-Sensitive Receptors

Noise-Sensitive Property	Receptor	Stationary Sound Levels L_{eq} (dBA) [1]		Meets Criteria? (Y/N)
		Day/Evening (0700-2300h)	Night (2300-0700h) [2]	
Future Worst-Case [3]	R6	48	NA	Yes
Residence at Whistle Bare Campground	R3	49	NA	Yes
1960 Whistle Bare Road	R4	54	NA	Yes
2028 Whistle Bare Road	R5	54	NA	Yes

Notes: [1] Sound levels shown represent the worst-case impact on all of the designated campground areas of the property.
[2] Surrounding stationary sources are not in operation during the nighttime period.
[3] Sound levels shown are from a default 1.5 m high receptor that was placed on the property.

The resulting sound levels at Whistle Bare Campground were predicted to be well below the ambient sound levels due to surrounding transportation sources.

As a conservative assessment of noise impacts, compliance with the guideline limits was shown based on the combined impacts from all surrounding industries.

The stationary noise impacts were found to be at or below the ambient sound levels on all areas of the property, during all periods of the day. Therefore, no noise mitigation is required.

Part 2: Impacts of the Development on the Surroundings

In terms of the noise environment of the area, it is expected that the project will have a negligible effect on the neighbouring properties.

The traffic related to the proposed development will be small relative to the existing traffic volumes within the area and is not of concern with respect to noise impact.

The development does not include new buildings, therefore, rooftop air handling units, HVAC equipment, etc. are not a concern.

4.0 Conclusions and Recommendations

The potential for noise impacts on proposed development have been assessed. Impacts of the surroundings on the development are not expected to require mitigation and are detailed in **Section 2.0** and **Section 3.0** of this report. Based on the results of our studies, the following conclusions have been reached:

4.1 Transportation Noise

- An assessment of transportation noise impacts has been completed for the surrounding roadways and railways.

- Based on transportation façade sound levels, outlined in **Section 2.**, the proposed expansion of the Whistle Bare Campground will not require additional noise mitigation strategies. The future expansion towards Whistle Bare Road is not predicted to experience sound levels greater than the existing campsites.

4.2 Industrial "Stationary" Noise

- "Stationary" noise impacts from the surrounding area on the proposed development have been accessed and are outlined in **Section 3.0** of this report.

- As outlined in **Section 3.4**, the sound levels from the surrounding industries on the proposed development are predicted to be at or below the NPC-300 sound level limits for stationary sources.

5.0 References

International Organization for Standardization, ISO 9613-2: *Acoustics – Attenuation of Sound During Propagation Outdoors Part 2: General Method of Calculation*, Geneva, Switzerland, 1996.

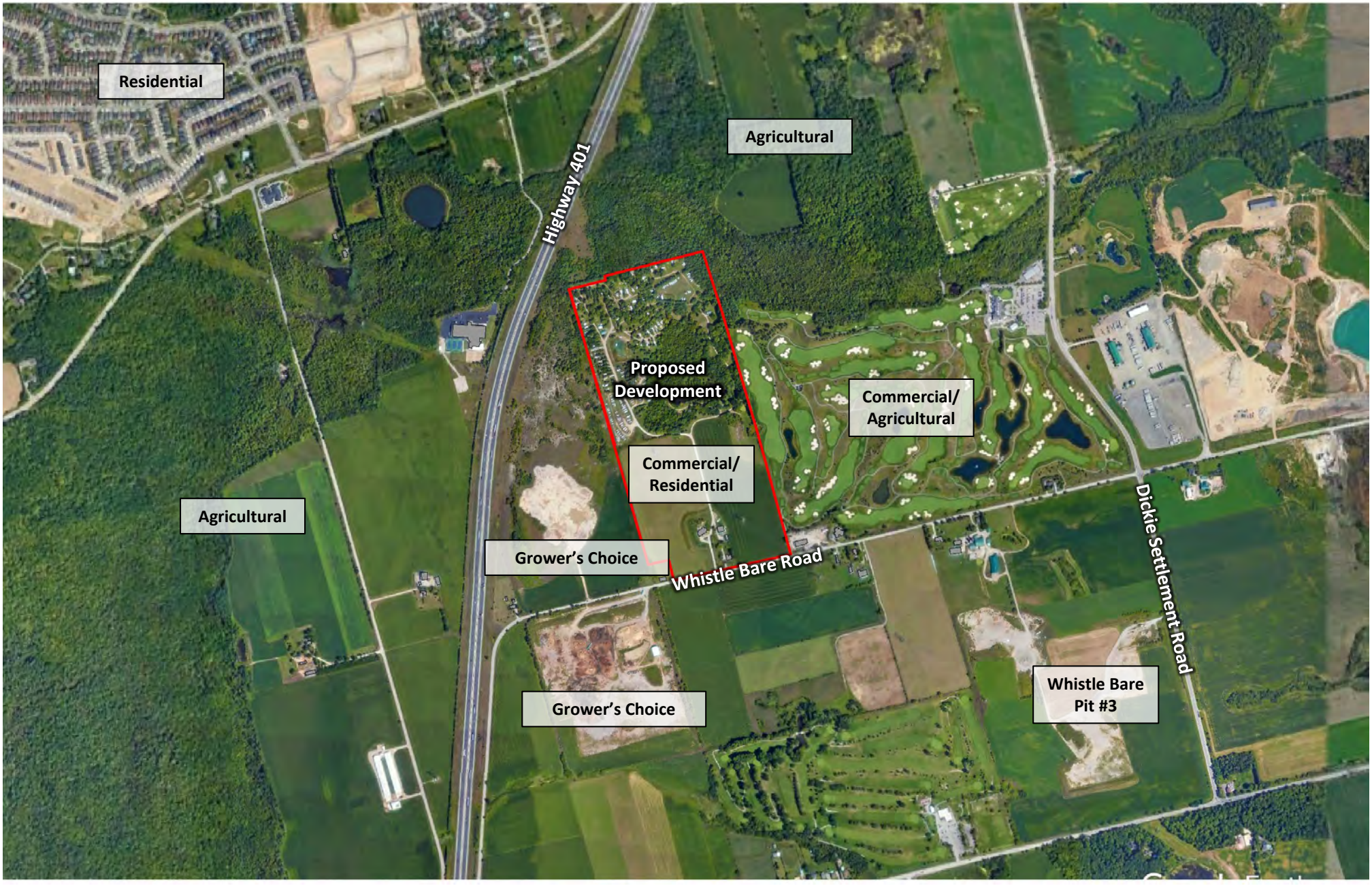
Ontario Ministry of the Environment, Conservation and Parks (MECP), 1989, Ontario Road Noise Analysis Method for Environment and Transportation (ORNAMENT).

Ontario Ministry of the Environment, Conservation and Parks (MECP), 2013, Publication NPC-300: Environmental Noise Guideline: Stationary and Transportation Sources – Approval and Planning

This page intentionally left blank
for 2-sided printing purposes

Figures

This page intentionally left blank
for 2-sided printing purposes



Property Line

Modelled Building

Figure No. **1**

Context Plan

1898 Whistle Bare Road
Cambridge, Ontario

Project North

Scale: 1:15000
Date: 09/20/2019
File No.: 241.19176
Drawn By: JWD

novus ENVIRONMENTAL
NOW PART OF SLR

Property Line
Future Expansion
Modelled Building

Figure No. **2**

Whistle Bare Development Plan

1898 Whistle Bare Road
Cambridge, Ontario

Project North

Scale: 1:7000
Date: 09/20/2019
File No.: 241.19176
Drawn By: JWD

novus ENVIRONMENTAL
NOW PART OF SLR

Property Line
Future Expansion
Modelled Building
Line Source (Moving)
Receptor

Figure No. **3**

Property Sound Levels – Roadway Calculation Grid

1898 Whistle Bare Road
Cambridge, Ontario

Project North

Scale: 1:7000
Date: 09/20/2019
File No.: 241.19176
Drawn By: JWD

novus ENVIRONMENTAL
NOW PART OF SLR

Property Line
Future Expansion
Modelled Building
Line Source (Moving)
Receptor

Figure No. **4**

Property Sound Levels - Roadway

1898 Whistle Bare Road
Cambridge, Ontario

Project North

Scale: 1:7000
Date: 09/20/2019
File No.: 241.19176
Drawn By: JWD

novus ENVIRONMENTAL
NOW PART OF SLR

Property Line
Future Expansion
Modelled Building
Line Source (Moving)
Receptor

Figure No. **5**

Property Sound Levels – Ambient Roadway

1898 Whistle Bare Road
Cambridge, Ontario

Project North

Scale: 1:7000
Date: 09/20/2019
File No.: 241.19176
Drawn By: JWD

novus ENVIRONMENTAL
NOW PART OF SLR

Property Line
Future Expansion
Area Source
Line Source (Moving)
Stationary Source

Figure No. **6**

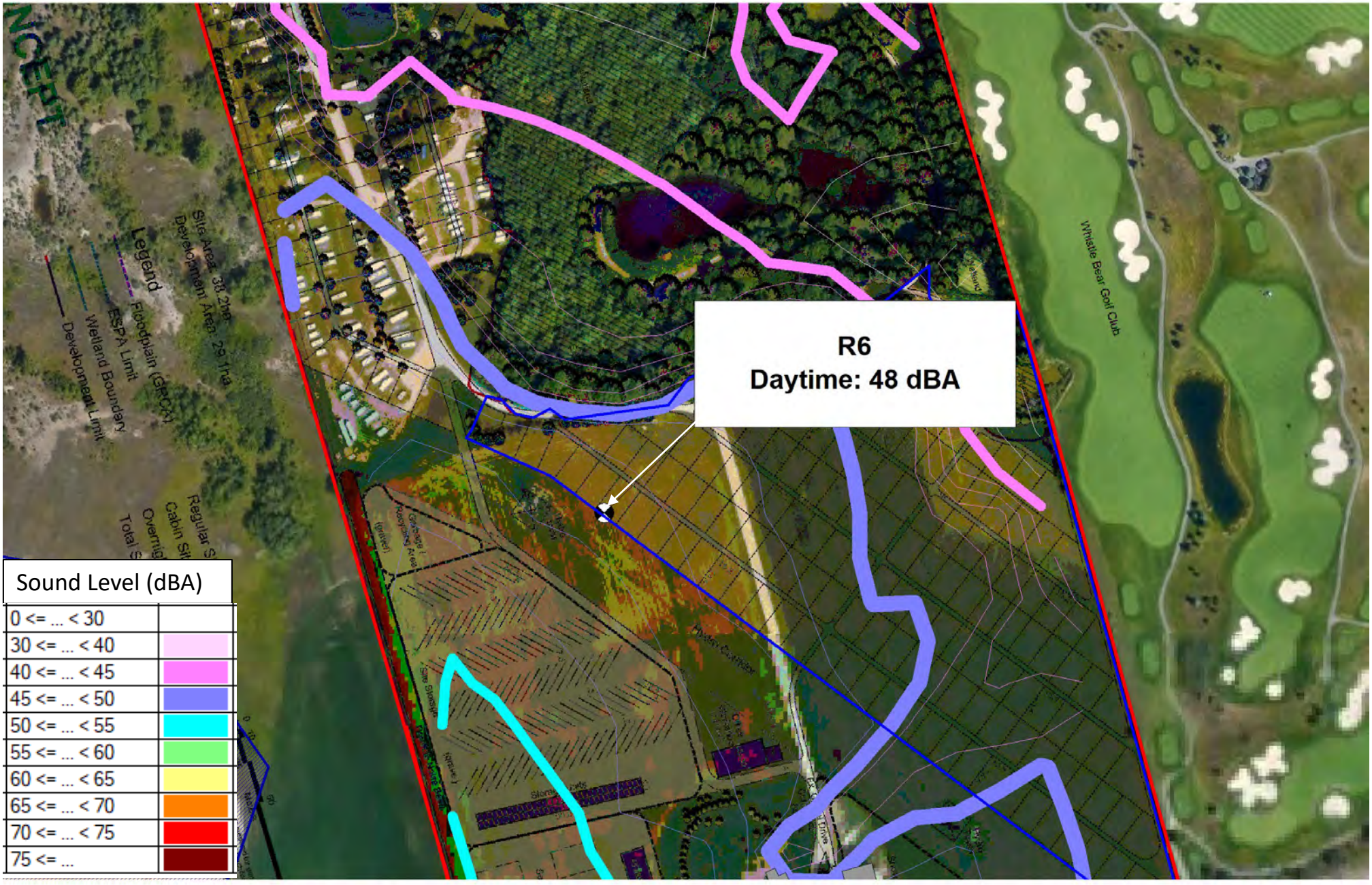
Stationary Sources Modelled

1898 Whistle Bare Road
Cambridge, Ontario

Project North

Scale: 1:6000
Date: 09/20/2019
File No.: 241.19176
Drawn By: JWD

novus ENVIRONMENTAL
NOW PART OF SLR



Property Line
Future Expansion
Receptor

Figure No. **7**

Property Sound Levels – Surrounding Stationary Calculation Grid Example

1898 Whistle Bare Road
Cambridge, Ontario

Project North

Scale: 1:3000
Date: 09/20/2019
File No.: 241.19176
Drawn By: JWD

novus ENVIRONMENTAL
NOW PART OF SLR

Property Line
Future Expansion
Future Expansion
Line Source (Moving)
Stationary Source

Figure No. **8**

Property Sound Levels – Surrounding Stationary

1898 Whistle Bare Road
Cambridge, Ontario

Project North

Scale: 1:7000
Date: 09/20/2019
File No.: 241.19176
Drawn By: JWD

novus ENVIRONMENTAL
NOW PART OF SLR

Appendix A

This page intentionally left blank
for 2-sided printing purposes

Proposed Addition to the Campground

Whistle Bear Golf Club

Ex. Washrooms

Ex. Pavillion

Ex. Gravel Drive

Wetland

Pond

ESPA LIMIT (FROM NSRI MAPPING) (OCTOBER 18, 2018)

WETLAND SURVEYED LIMIT (FROM NSRI MAPPING) (OCTOBER 18, 2018)

Approx. Location of ex. trailer to remain

Approx. Location of ex. trailer to remain

Overnight Sites

Bridge

Court

Playground

Pool

Rec Hall

13.7x25.9 (355sm)

Parking

Cabin Sites

Hydro Corridor

Hydro Tower

Rec Hall 25.9x35 (906sm)

6m Setback

Parking

Pool / Rec Area

Show Lot

Ex. Shed

Ex. House

Ex. Garage

Ex. Gravel Drive Controlled Access

Office / Workshop (547sm) 15x30

Storage Units 100.0

Garbage / Recycling Area (gravel)

Site Storage (gravel)

45'x80' Wastewater Treatment Facility

(gravel)

Septic Beds

Possible Noise Berm

Whistle Bare Road

9m Setback

Site Area: 38.2ha.
Development Area: 29.1ha.

Legend

- Floodplain (GRCA)
- ESPA Limit
- Wetland Boundary
- Development Limit

Regular Sites: 347
Cabin Sites: 10
Overnight Sites: 26
Total Sites: 383

0 10 50 150
5 25 Meters 100

NOTE: This concept has been prepared for general feasibility purposes only. Building code requirements and technical / architectural design have not been addressed.

Scale 1:2,500 | April 2, 2019 | Project No.: 18088 | Drawn By: SL

GSP group

Whistle Bare Campground
DEVELOPMENT CONCEPT
1912 Whistle Bare Road, Cambridge

This page intentionally left blank
for 2-sided printing purposes

Appendix B

This page intentionally left blank
for 2-sided printing purposes

Region of Waterloo AADT Forecast for Noise Studies

1. Development/Location	Whistle Bare Rd @ Dickie Settlement Rd (west leg)
2. Current AADT (2019)	600
3. Forecast AADT (2029)	700
4. Commercial Vehicle Rates	% Medium Trucks 2.2% % Heavy Trucks 20.3%
5. Posted Speed Limit	80 km/h
6. Day/Night Splits	Regional Standard 90/10 Day/Night Split
7. Expiry	31-Dec-2021

8. Notes

This forecast is intended for the purpose of carrying out a noise study only. The above AADTs represent the traffic volumes at the intersection of Whistle Bare Rd. @ Dickie Settlement Rd. (west leg), in the Township of North Dumfries, ON. This forecast remains valid up to the date indicated above. The Region of Waterloo should be contacted for an updated forecast if there are plans to use this forecast beyond the above validity period.

Region of Waterloo AADT Forecast for Noise Studies

1. Development/Location	Whistle Bare Rd @ Dickie Settlement Rd (north leg)
2. Current AADT (2019)	8,500
3. Forecast AADT (2029)	9,600
4. Commercial Vehicle Rates	% Medium Trucks 1.2% % Heavy Trucks 16.3%
5. Posted Speed Limit	80 km/h
6. Day/Night Splits	Regional Standard 90/10 Day/Night Split
7. Expiry	31-Dec-2021

8. Notes

This forecast is intended for the purpose of carrying out a noise study only. The above AADTs represent the traffic volumes on Dickie Settlement Rd @ Whistle Bare Rd (north leg), in the Township of North Dumfries, ON. This forecast remains valid up to the date indicated above. The Region of Waterloo should be contacted for an updated forecast if there are plans to use this forecast beyond the above validity period.

TECHNICAL MANUALS

Ontario Provincial Standards
Traffic Volumes
Revision Info Sheets
CDED
Special Provisions
MTO Drawings
Electrical CDED *
Electrical CDED MTOD *
Electrical CDED SP *
Electrical ATMS CDED *
Electrical ATMS CDED MTOD *
Electrical ATMS CDED SP *
Structural Standard Drawings
Environmental Standards and Practices

* Special Note: All the Electrical Documents are now available within following menus items: CDED, Special Provisions and MTO Drawings.

Ontario Provincial Highways Traffic Volumes On Demand

The follow page is broken down into two sections. Section 1: allows you to dynamically filter traffic volumes down to a segment of a highway and if available report on both that segment's distance in kilometers and the annual average daily traffic volumes (AADT). Section 2: contains traffic volumes in PDF format for downloading.

1. Dynamic traffic volumes lookup for the year 2016

Complete steps 1 and 2 in sequential order to report on different sections of highways. Repeat steps 1 and 2 to review additional highways and their sections. Use step 3 to navigate the sections of highway and finally uses step 4 to isolate segments of each section.

1. Select a **highway** that you would like to report on: 401
2. Click on the following link to render all the available sections within highway selected in the step above.
3. Isolate each **available section** within the **highway** that you selected in step 1 by using the navigation links provided or using the **location from** drop down selection box.

Showing section 122 of 160 for highway 401 previous | next

Location from:
HOMER WATSON BV IC 275(N)FOUNTAIN ST(S)-RR 28

Location to:
WATERLOO RD 97 IC-268-CEDAR CREEK RD

Distance (km):
7.1

Annual Average Daily Traffic (AADT):
52, 900

2. Traffic Volume documents available for downloading in portable document format (PDF)

Please note that depending on your browser's settings, PDF documents will either download to your workstation or open in a PDF reader. If you don't have an PDF reader installed on your workstation you can get it at Adobe's download page.

As outlined in the OPS Accessible Customer Service Policy, we are committed to providing accessible customer service. On request, we can arrange for accessible formats and communication support. Please contact us.

Document Links...

1. Provincial Highways Traffic Volumes 1988-2016 (PDF - 2.09 MB)
2. Provincial Highways Traffic Volumes 2016 AADT Only (PDF - 179 KB)

Last modified: December 08, 2016

O R N A M E N T - Sound Power Emissions & Source Heights

Ontario Road Noise Analysis Method for Environment and Transportation

Road Segment ID	Roadway Name	Link Description	Speed (kph)	Period (h)	Total Traffic Volumes	Auto %	Med %	Hvy %	Auto	Med	Heavy	Road Gradient (%)	Cadna/A Ground Absorption G	PWL (dBA)	Source Height, s (m)
whistlebare_west	Whistle Bare Road West Leg	Daytime Impacts	80	16	630	77.5%	2.2%	20.3%	488	14	128	0	0.00	**77.8**	**2.1**
		Nighttime Impacts	80	8	70	77.5%	2.2%	20.3%	54	2	14	0	0.00	**71.2**	**2.1**
whistlebare_north	Whistle Bare Road North Leg	Daytime Impacts	80	16	8640	82.5%	1.2%	16.3%	7128	104	1408	0	0.00	**88.3**	**2.0**
		Nighttime Impacts	80	8	960	82.5%	1.2%	16.3%	792	12	156	0	0.00	**81.7**	**2.0**
401	401	Daytime Impacts	100	16	40939	80.0%	5.0%	15.0%	32752	2047	6141	0	0.00	**96.7**	**2.0**
		Nighttime Impacts	100	8	19266	80.0%	5.0%	15.0%	15413	963	2890	0	0.00	**96.5**	**2.0**
whistlebare_west	Whistle Bare Road West Leg	Daytime/Evening Impacts	80	1	630	2.5%	0.0%	0.5%	16	0	3	0	0.00	**73.8**	**2.0**
		Nighttime Impacts	80	1	70	0.3%	0.0%	0.1%	0	0	0	0	0.00	**55.0**	**2.0**
whistlebare_north	Whistle Bare Road North Leg	Daytime/Evening Impacts	80	1	8640	2.5%	0.0%	0.5%	219	3	43	0	0.00	**85.2**	**2.0**
		Nighttime Impacts	80	1	960	0.3%	0.0%	0.1%	3	0	1	0	0.00	**66.4**	**2.0**
401	401	Daytime/Evening Impacts	100	1	40939	3.2%	0.1%	0.8%	1322	38	346	0	0.00	**95.7**	**2.1**
		Nighttime Impacts	100	1	19266	3.2%	0.1%	0.8%	622	18	163	0	0.00	**92.5**	**2.1**

This page intentionally left blank
for 2-sided printing purposes

Appendix C

This page intentionally left blank
for 2-sided printing purposes

Property Line
Future Expansion
Modelled Building
Line Source (Moving)
Receptor

Figure No. **C1**

STAMSON Validation

1898 Whistle Bare Road
Cambridge, Ontario

Project North

Scale: 1:4000
Date: 09/20/2019
File No.: 241.19176
Drawn By: JWD

novus ENVIRONMENTAL
NOW PART OF SLR

This page intentionally left blank
for 2-sided printing purposes

STAMSON 5.0 NORMAL REPORT Date: 19-09-2019 14:30:00
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: whistle.te Time Period: 16 hours
Description: Receptor at Southwest Corner of Property

Road data, segment # 1: 401_S1

Car traffic volume : 32752 veh/TimePeriod
Medium truck volume : 2047 veh/TimePeriod
Heavy truck volume : 6141 veh/TimePeriod
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: 401_S1

Angle1 Angle2 : -90.00 deg 45.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 450.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 2: WhistleBare

Car traffic volume : 976 veh/TimePeriod
Medium truck volume : 28 veh/TimePeriod
Heavy truck volume : 256 veh/TimePeriod
Posted speed limit : 80 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: WhistleBare

Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 265.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Road data, segment # 3: 401_S2

Car traffic volume : 32752 veh/TimePeriod
Medium truck volume : 2047 veh/TimePeriod
Heavy truck volume : 6141 veh/TimePeriod
Posted speed limit : 100 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 3: 401_S2

Angle1 Angle2 : 15.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 2 (Reflective ground surface)
Receiver source distance : 500.00 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: 401_S1

Source height = 1.97 m

ROAD (0.00 + 65.64 + 0.00) = 65.64 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	45	0.00	81.66	0.00	-14.77	-1.25	0.00	0.00	0.00	65.64

Segment Leq : 65.64 dBA

Results segment # 2: WhistleBare

Source height = 2.12 m

ROAD (0.00 + 53.24 + 0.00) = 53.24 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
-90	90	0.00	65.71	0.00	-12.47	0.00	0.00	0.00	0.00	53.24

Segment Leq : 53.24 dBA **– 3dBA (doubling traffic volumes) = 50.24 dBA**

Results segment # 3: 401_S2

Source height = 1.97 m

ROAD (0.00 + 62.63 + 0.00) = 62.63 dBA

Angle1	Angle2	Alpha	RefLeq	P.Adj	D.Adj	F.Adj	W.Adj	H.Adj	B.Adj	SubLeq
15	90	0.00	81.66	0.00	-15.23	-3.80	0.00	0.00	0.00	62.63

Segment Leq : 62.63 dBA

Total Leq All Segments: 67.48 dBA

TOTAL Leq FROM ALL SOURCES: 67.48

Appendix D

This page intentionally left blank
for 2-sided printing purposes

Table D.1: Summary of Noise Source Sound Power Levels

Source Description	63 (dBA)	125 (dBA)	250 (dBA)	500 (dBA)	1000 (dBA)	2000 (dBA)	4000 (dBA)	8000 (dBA)	Total PWL (dBA)	Notes
Grower's Choice										
Heavy Truck Activity	102	103	99	99	95	93	88	80	101	- based on maximum (Lmax) pass-by levels taken from a similar engine. - Assumed 15 trucks/hour, moving at 10 km/h - 900m long route around property assumed - Daytime-Evening operations only
Front - End Loaders	110	104	100	100	102	100	93	89	106	- based on historical Novus data. - Assumed 3 loaders in the area operating during daytime/evening only - Assumed to operate 30min/hr
Bulldozer Activity	93	92	86	90	92	97	101	99	105	- based on historical Novus data. - Assumed to operate continuously during both daytime/evening - Area source assumed to be entire pit north of Whistle Bare Road
Wood Tub Grinder	101	102	105	103	103	101	95	87	108	- based on historical Novus data. - Single stationary source assumed to operate 1hour/day during daytime/evening