

# **Noise Feasibility Study**


## **Proposed Industrial Development**

### **37 Anderson Boulevard**

### **Uxbridge, Ontario**

Prepared for:  
Paulsan Construction Inc.  
408 Henry Street, Unit 1  
Brantford, ON N3S 7W1

Prepared by:



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Mandy Chan, PEng

May 19, 2022

Project No. 02200317

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# Table of Contents

|     |  |   |
|-----|--|---|
| 1   | INTRODUCTION & SUMMARY.....                                | 1 |
| 2   | SITE DESCRIPTION & NOISE SOURCES .....                     | 2 |
| 3   | CRITERIA .....   | 2 |
| 3.1 | Criteria for Stationary (Industrial) Sources of Sound..... | 2 |
| 4   | STATIONARY SOURCE ASSESSMENT.....                          | 4 |
| 4.1 | Results .....  | 5 |
| 5   | CONCLUSIONS AND RECOMMENDATIONS .....                      | 6 |
| 5.1 | Implementation.....  | 6 |

**Figure 1: Key Plan**

**Figure 2: Site Plan**

**Figure 3: Aerial Photo**

**Figure 4: Predicted Daytime & Evening Steady Source Sound Level Contours**

**Figure 5: Predicted Nighttime Steady Source Sound Level Contours**

**Appendix A: Traffic Data & Sample Calculations**



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# 1 INTRODUCTION & SUMMARY

Howe Gastmeier Chapnik Limited (HGC Engineering) was retained by Paulsan Contracting Inc. to undertake a noise assessment for a proposed industrial development to be located west of Concession Road 2, north side of Highway 47 and south side of Anderson Boulevard, in the Town of Uxbridge, Ontario.

The purpose of this study is to investigate the potential noise impact of a proposed warehouse building in support of municipal planning and approvals process under the Planning Act, specifically for site plan approval. The current analysis is based on criteria contained in the noise guidelines of the Ministry of Environment, Conservation and Park (MECP); aerial photos, a site plan and a site visit. The analysis includes assessment of the noise emissions of both the anticipated trucking and rooftop mechanical equipment with respect to the closest residences to the east of the site and on the south side of Highway 47.

The results of the analysis indicate that the development is feasible at this site. Calculations indicate that sound emissions from the industrial facility can be within the applicable limits of the MECP guidelines at the nearby residences. Noise mitigation is not required. The reader is referred to the main body of the report for assumptions and results of the analysis.



## 2 SITE DESCRIPTION & NOISE SOURCES

The site is located west of Concession Road 2, north side of Highway 47 and south side of Anderson Boulevard, specifically at 37 Anderson Boulevard in Uxbridge, Ontario. A key plan is attached as Figure 1 and a north arrow has been provided for reference purposes. The site plan prepared by Y.T. Architectural Services Inc. dated April 19, 2022 is attached as Figure 2. The development consists of one warehouse type building. An aerial photo showing the site, surrounding land uses and receptor locations is attached as Figure 3.

The acoustic environment of the site and surrounding area is best categorized as Class 2 (semi-urban) under MECP noise assessment guidelines. Road traffic on Highway 47 is the dominant noise source in the area as observed during a site visit in May 2022. There are residential and agricultural land uses on the south side of Highway 47 and to the east of the site. To the north and west of the site are industrial and commercial land uses. The site is elevated above Highway 47 and there are existing berms to the east of the property. There are also berms to the north of R3, adjacent to Highway 47 which provides shielding for the residence from the proposed site.

The primary sources of sound associated with the proposed development will be arriving, departing, and idling trucks and rooftop ventilation equipment.

## 3 CRITERIA

### 3.1 Criteria for Stationary (Industrial) Sources of Sound

MECP Guideline NPC-300 is the applicable guideline for use in investigating Land Use Compatibility issues with regard to noise. An industrial or commercial facility is classified in the MECP Guideline NPC-300 as a stationary source of sound (as compared to sources such as traffic or construction, for example) for noise assessment purposes. A stationary noise source encompasses the noise from all the activities and equipment within the property boundary of a facility including regular on-site truck traffic, material handling and mechanical equipment. In terms of background sound, the development is located in a semi-urban acoustical environment which is characterized by an acoustical environment dominated by road traffic and human activity, mainly during the daytime hours.



*Stationary Source (Steady Sound)*

NPC-300 is intended for use in the planning of both residential and commercial/industrial land uses and provides the acceptability limits for sound due to commercial operations in that regard. The facade of a residence (i.e., in the plane of a window), or any associated usable outdoor area that is considered a sensitive point of reception (within 30 m of a dwelling façade) per the definitions outline in the guideline. NPC-300 stipulates that the exclusionary sound level limit for a stationary noise source in urban Class 2 areas are taken to be 50 dBA during daytime and evening hours (07:00 to 19:00 and 19:00 to 23:00), and 45 dBA during Nighttime hours (23:00 to 07:00) at the plane of the windows of noise sensitive spaces. If the background sound levels due to road traffic exceed the exclusionary limits, then that background sound level becomes the criterion. The background sound level is defined as the sound level that occurs when the source under consideration is not operating, and may include traffic noise and natural sounds.

Commercial activities such as the occasional movement of customer/employee vehicles, deliveries to conveniences stores and restaurants and garbage collection are not of themselves considered to be significant noise sources in the MECP guidelines. Accordingly, these sources have not been considered in this study.

Two residential dwellings on the south side of Highway 47 and one to the east of the site are considered the representative noise sensitive receptors (R1 to R3). R1 to R3 are 2-storey residences. Receptor locations are shown on Figures 3-5.

Hourly road traffic information Highway 47 was obtained from Durham Region to determine the existing road traffic sound levels at the residential receptors for the purpose of setting the applicable criteria. The speed limit for Highway 47 is 70 km/h in the vicinity of the receptors. The predicted quietest daytime/evening hour and nighttime hour sound levels at the facade of the residences, which will be exposed to the proposed industrial facility, are found to be higher than the MECP exclusionary limits. As such, the sound level limits as summarized in Table 1 is therefore used in the following sections of this report as the applicable criteria for R1 to R3. Traffic data and minimum background traffic sound level calculations are provided in Appendix A.



**Table 1: Applicable Sound Level Limits, L<sub>EQ</sub> (dBA)**

| Receptor                                 | Sound Level Limits         |                             |                              |
|--|----------------------------|-----------------------------|------------------------------|
|  | Daytime<br>(7:00 to 19:00) | Evening<br>(19:00 to 23:00) | Nighttime<br>(23:00 to 7:00) |
| R1 (2-Storey residence to east)          | 53                         | 50                          | 45                           |
| R2 (2-Storey Residence to the south)     | 60                         | 55                          | 50                           |
| R3 (2-Storey Residence to the southeast) | 50                         | 50                          | 45                           |

Compliance with MECP criteria generally results in acceptable levels of sound at residential receptors although there may be residual audibility during periods of low background sound.

## 4 STATIONARY SOURCE ASSESSMENT

Predictive noise modelling was used to assess the potential noise impact of equipment and trucking activities at the residential receptors. The software used for this purpose (*Cadna-A 2022 version 189.5221*) is a computer implementation of ISO Standard 9613-2.2 “Acoustics - Attenuation of Sound During Propagation Outdoors.” The ISO method accounts for reduction in sound level with distance due to geometrical spreading, air absorption, ground attenuation and acoustical shielding by intervening structures such as barriers. Topographical information was obtained from MECP terrain data.

Tenant information for the building is currently unknown. However, it is understood that the building will likely be used for general warehousing. Significant impulsive sounds are not expected as coupling and decoupling of trailers are generally not expected. The primary sources of sound associated with a warehousing facility will be arriving, departing, and idling trucks and air conditioning condenser equipment associated with the proposed buildings.

The noise prediction model was based on sound emission levels for various noise sources, assumed operational profiles (during the daytime/evening and nighttime), and established engineering methods for the prediction of outdoor sound propagation. These methods include the effects of

distance, air absorption, and acoustical screening by barrier obstacles such as buildings. The sound power levels measured from other facilities similar to this were used in the analysis and are summarized in Table 2.

**Table 2: Source Sound Power Levels [dB re 10-12 W]**

| Source                 | Octave Band Centre Frequency [Hz] |     |     |     |    |    |    |    | dBA |
|------------------------|-----------------------------------|-----|-----|-----|----|----|----|----|-----|
|                        | 63                                | 125 | 250 | 500 | 1k | 2k | 4k | 8k |     |
| Tractor Trailer Passby | 101                               | 100 | 94  | 96  | 97 | 95 | 91 | 86 | 101 |
| Idling Truck           | 96                                | 91  | 88  | 88  | 91 | 90 | 81 | 70 | 95  |
| HVAC unit, 15-tonne    | 67                                | 92  | 88  | 87  | 83 | 78 | 72 | 67 | 88  |

*The following information and assumptions were used in the analysis:*

- The height of the building is assumed to be 8 m;
- The facility will typically operates from 7:00 am to 5:00 pm (daytime hours only);
- Three to Four 15-tonne rooftop HVAC units per tenant space (1.5 m high);
- Receptor height for R1 to R3 is 4.5 m (relative to existing grade).

*Assumed daytime/evening and nighttime worst-case busiest hour scenario:*

- 8 trucks arrive and depart the facility during the daytime hours(1 per tenant space);
- 1 truck idling at the loading area for each tenant unit for 15 minutes each;
- All rooftop equipment operates continuously at full capacity during daytime/evening hours and 50% capacity during nighttime hour.

The above outlined sound levels and various features of the site were used as input to the predictive computer model. The results are summarized below.

## 4.1 Results

### *Steady Sound Levels*

The calculations consider the acoustical effects of distance and shielding by the buildings. The predicted sound levels due to the trucking activities (arriving, idling and departing) and rooftop ventilation equipment at the closest residences (R1 to R3) during an assumed worst-case busiest hour operating scenario, are summarized in the following table and shown on Figures 4 and 5 at receptor height.



**Table 3: Predicted Steady Sound Levels (L<sub>EQ1HR</sub>) at Residential Receptors during a Worst-case Operating Scenario hour**

| Receptor | Criteria Day/Eve/Night (dBA) | Predicted Steady Source Sound Level at Facade (dBA) |                         |                          | Predicted Steady Source Sound Level at OLA (dBA) |
|----------|------------------------------|---|-------------------------|--------------------------|--|
|          |                              | Daytime (7:00 – 19:00)                              | Evening (19:00 – 23:00) | Nighttime (23:00 – 7:00) | Daytime (7:00 – 19:00)                           |
| R1       | 53/50/45                     | <40   | <35                     | <35                      | <40  |
| R2       | 60/55/50                     | 44  | <35                     | <35                      | 41   |
| R3       | 50/50/45                     | <40   | <35                     | <35                      | <40  |

The results of this analysis indicate that the predicted steady sound levels due to truck passbys, idling trucks and rooftop mechanical equipment are expected to be within the MECP’s applicable limits at the residential receptors. Noise mitigation is not required for the proposed industrial building.

## 5 CONCLUSIONS AND RECOMMENDATIONS

The results of the study indicate that the industrial development is feasible at this site. Calculations indicate the sound levels will meet the applicable MECP guideline limits at neighbouring receptors under an assumed worst-case operating scenario. Noise mitigation is not required.

### 5.1 Implementation

- 1) Prior to the issuance of building permits for this development, a Professional Engineer qualified to provide acoustical engineering services in Ontario shall review the site plan, roof plan and mechanical specifications to confirm that the selected rooftop mechanical units and operations are in general conformance with the assumptions contained in the noise study.

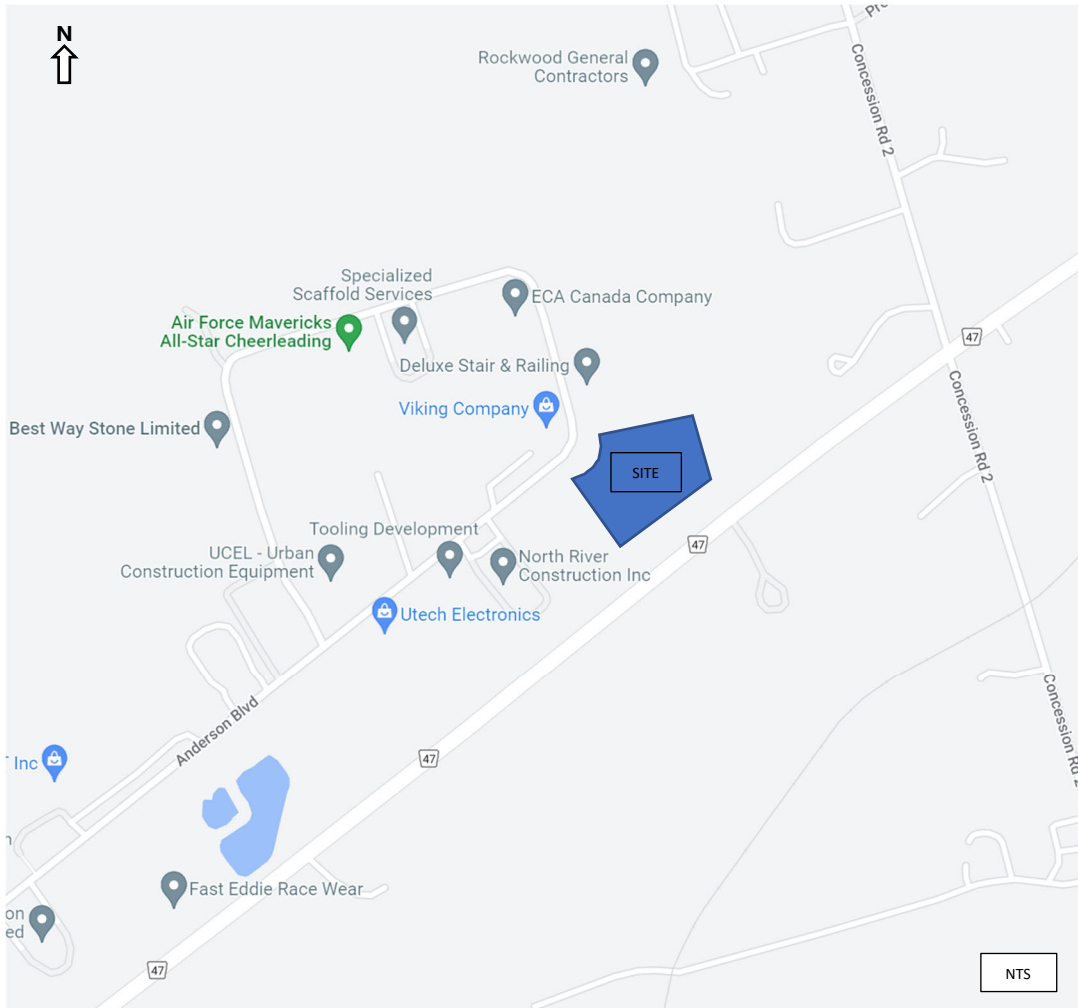


Figure 1: Key Plan



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CANADA N3S 7W1 EMAIL: info@paulsan.com  
www.paulsan.com

**ONTARIO BUILDING CODE CLASSIFICATION:**  
GROUP D (OFFICE OCCUPANCY) AND GROUP F2 (FACTORY INDUSTRIAL)  
3 STOREY OFFICE & 1 STOREY BUILDING TO BE SPRINKLERED AS PER ARTICLE 3.2.2.54. & 3.2.2.70.B. (O.B.C.)

**SITE STATISTICS:**  
LOT AREA 19,634.05 s.m. 211,339.15 s.f. 4.85 acres  
LOT COVERAGE: 7,557.06 s.m. 81,343.52 s.f. 38.49 %  
LANDSCAPE COVERAGE: ??? s.m. ??? s.f. ??? %  
ASPHALT COVERAGE: ??? s.m. ??? s.f. ??? %

**BUILDING AREA & STATISTICS:**  
PROPOSED INDUSTRIAL G.F.A. s.m. 81,343.52 s.f.

**PARKING REQUIREMENTS:** BYLAW No.61-19 SECTION 5.15

SIZE: 5.7 (a) (STANDARD)  
- 2700 X 5700  
5.6 (c) (ACCESSIBLE):  
- 4000 X 5700  
AMOUNT: 5.12.1 (STANDARD)  
- INDUSTRIAL: 1 CAR/100 s.m.  
(7,557.06/100 = 76 CARS)  
AMOUNT: 5.6.1 (ACCESSIBLE)  
- 4% = 3 SPACES  
NUMBER OF PARKING REQUIRED (STANDARD): 76 CARS  
NUMBER OF CARS PROVIDED: 76 CARS  
NUMBER OF ACCESSIBLE PARKING REQUIRED (4%): 3 SPACES  
NUMBER OF ACCESSIBLE PARKING PROVIDED: 5 SPACES  
LOADING: BYLAW No.61-16 SECTION 5  
SIZE: 5.11 (c)  
- 3500 X 9000  
AMOUNT: 5.10.1  
- BUILDING SIZE (EXCEEDING 7,500 s.m.)  
- NUMBER OF LOADING SPACES REQUIRED = 3  
- NUMBER OF LOADING SPACES PROVIDED = 6

**LEGEND**

- HEAVY DUTY ASPHALT PAVING: 40mm HL-3, 50mm HL-8, 150mm - 20mm CRUSHER RUN LIMESTONE, 450mm - 50MM CRUSHER RUN LIMESTONE
- LIGHT (PARKING) DUTY ASPHALT PAVING: 40mm HL-3, 50mm HL-8, 150mm - 20mm CRUSHER RUN LIMESTONE, 350mm - 50MM CRUSHER RUN LIMESTONE
- ▲ DENOTES ENTRANCE/EXIT DOORWAYS
- +○ DENOTES PROPOSED LIGHT STANDARDS
- DENOTES ILLUMINATED WALL PACKS (SEE SITE LIGHTING DRAWINGS)
- ⊙ DENOTES ARCHITECTURAL EXTERIOR WALL MOUNTED LIGHTING (SEE SITE LIGHTING DRAWINGS)

**SITE PLAN NOTES:**

- SITE PLAN INFORMATION TAKEN FROM: PLAN OF TOPOGRAPHICAL SURVEY OF PART OF LOT 6, REGISTERED PLAN 489, CITY OF PICKERING, REGIONAL MUNICIPALITY OF DURHAM, PREPARED BY OMAR MANNI SURVEYING LTD. PROJECT No. 14-2007. ARCHITECT IS NOT RESPONSIBLE FOR SURVEY AS NOTED ABOVE.
- DIMENSIONS ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.
- CONTRACTOR SHALL VERIFY ALL UNDERGROUND SERVICES PRIOR TO EXCAVATION.
- REFER TO DRAWING SSG-1 FOR SITE GRADING AND SERVICES INFORMATION, DRAWING L-1 FOR LANDSCAPE INFORMATION, DRAWING E-1 FOR SITE LIGHTING INFORMATION.
- ALL CONCRETE CURBS AND GUTTERS TO BE INSTALLED AS PER CITY OF PICKERING PLANNING & DEVELOPMENT STANDARD "BARRIER CURB" DETAIL P-600. (SEE DETAILS 1 & 2/A-1) AS WELL AS REFER TO SITE GRADING DRAWING SSG-3.
- ALL DIRECTIONAL SIGNS ON SITE AS REFERENCED ARE TO CONFORM TO THE SPECIFICATIONS AS REQUIRED BY THE GOVERNING REGULATORY STANDARDS.

|   |          |  |    |
|---|----------|--|----|
| 5 | 22/04/19 | REVISED TO 7557.06 S.F. INDUSTRIAL BUILDING W/O OFFICE | YT |
| 4 | 22/04/08 | PROPOSED INDUSTRIAL BUILDING W/O OFFICE                | YT |
| 3 | 22/04/06 | PROPOSED 3 ALTERNATE SCENARIOS                         | YT |
| 2 | 22/03/30 | ISSUED FOR REVIEW (REVISED FOR SEPTIC SYSTEM)          | YT |
| 1 | 22/03/10 | ISSUED FOR REVIEW                                      | YT |

No: \_\_\_\_\_ Date: \_\_\_\_\_ By: \_\_\_\_\_

**REVISIONS**  
Contractor shall check and verify all dimensions and report any discrepancies to the architect before proceeding with the work.

Drawing Name: **SITE PLAN**

Project Name: **PROPOSED: INDUSTRIAL BUILDING DEVELOPMENT 37 ANDERSON BLVD., UXBRIDGE, ONTARIO**

Y.T. ARCHITECTURAL SERVICES INC.  
Architect.  
333 GREENFIELD AVE., NORTH YORK, ONTARIO M2N 3E7  
TEL: (416) 222-0612  
FAX: (416) 512-7828

Scale: 1:300  
Date: MAR. 2022  
Drawn by: M.K.  
Checked by: Y.T.  
Project No.: \_\_\_\_\_  
Drawing No.: **22147 A-1**

Figure 2 : Site Plan



Figure 3: Aerial Photo



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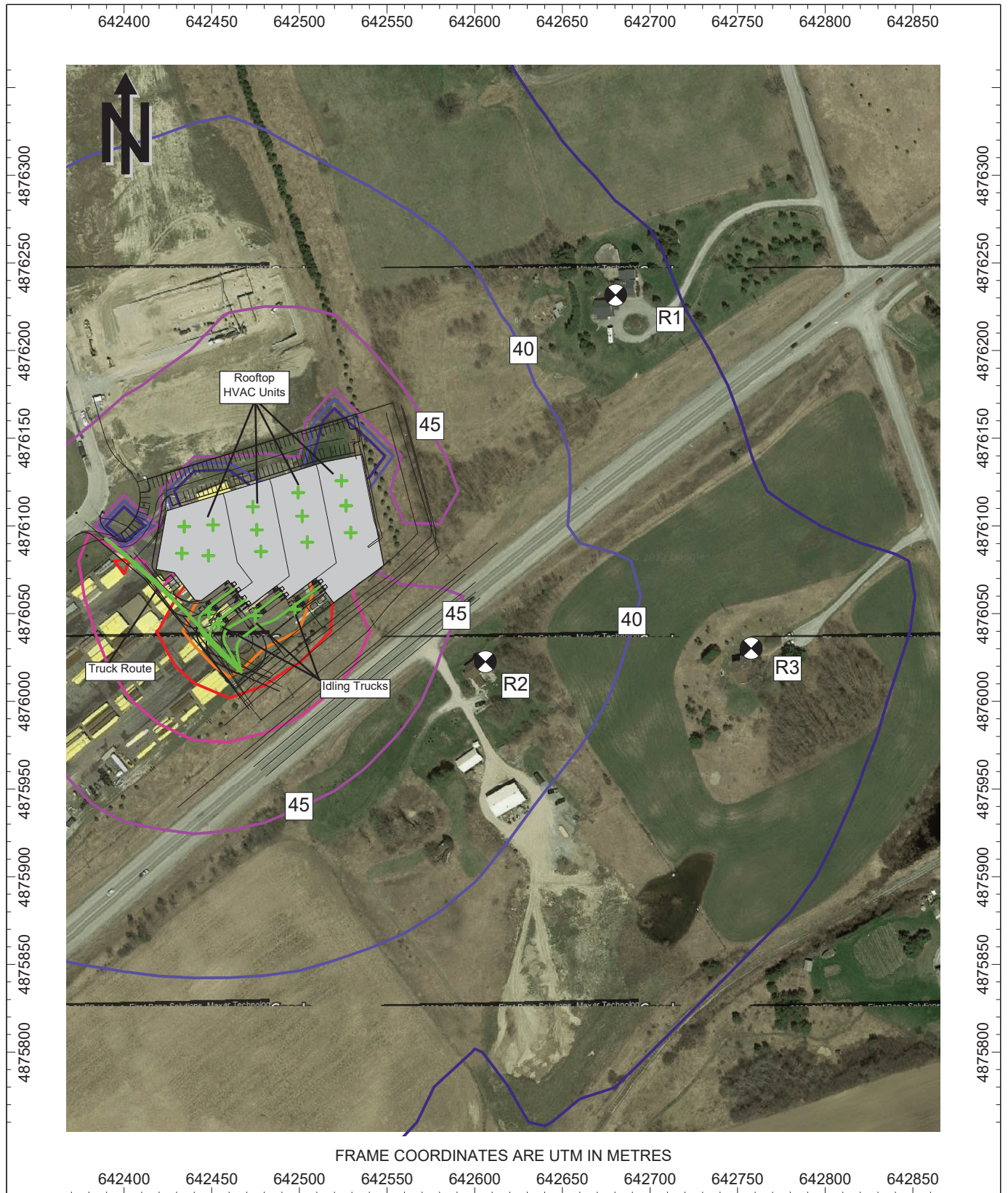


Figure 4: Predicted Daytime Sound Levels Contours,  $Leq_{1hr}$  [dBA]

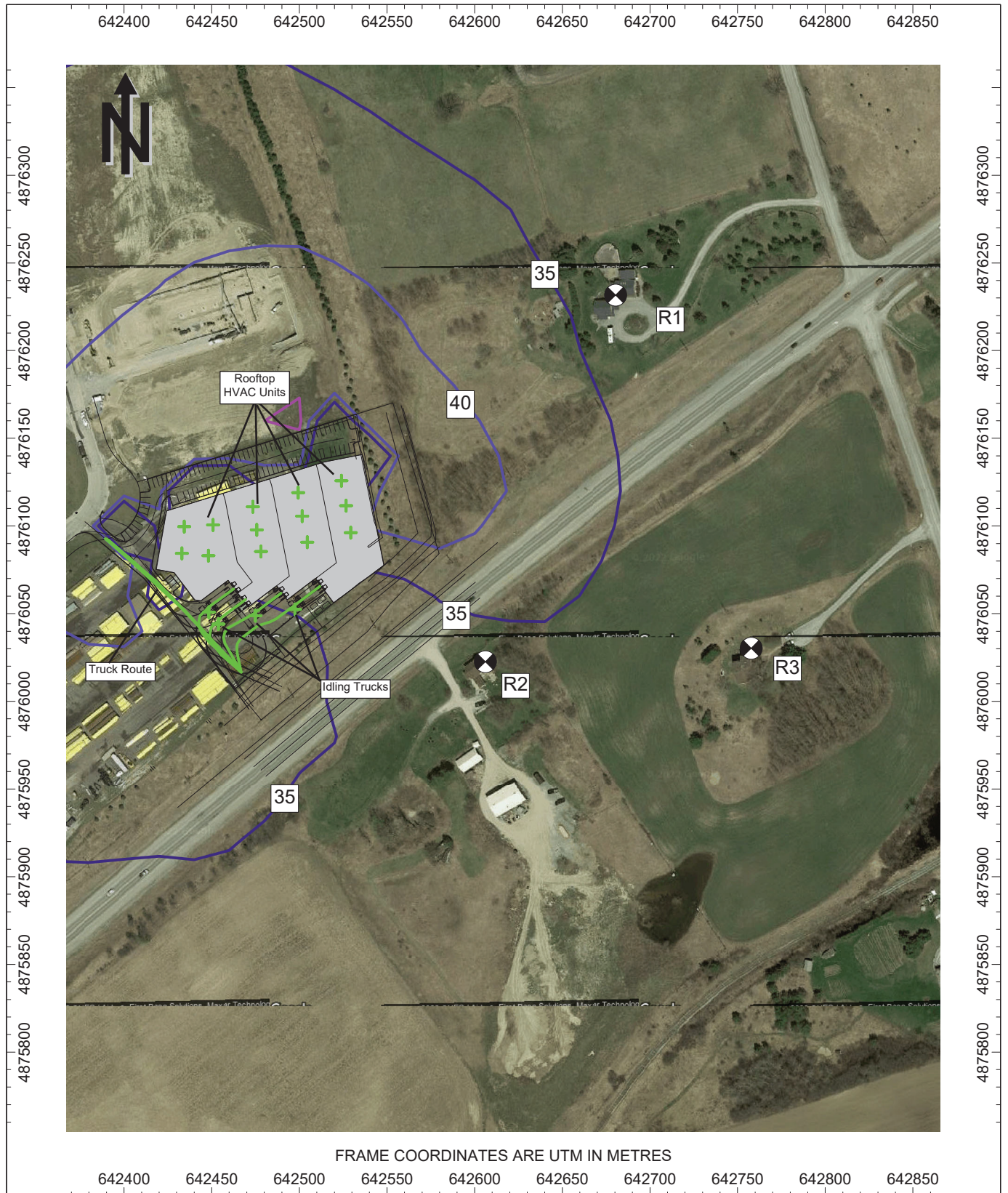


Figure 5: Predicted Nighttime Sound Levels Contours, Leq1hr [dBA]

# APPENDIX A

## Road Traffic Data & Sample Calculations



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# ATR Counts Report

## HIGHWAY 47 (RR HWY 47) - Uxbridge E of YORK-DURHAM T/L (RR 30) - Uxbridge

| ATR No:      | 7401        |              | Affiliated PCS No: |             |             |             | 900         |             | Start Date: |             |             |              | 09/08/2017  |              | End Date:   |             | 09/14/2017 |  |
|--------------|-------------|--------------|--------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|-------------|--------------|-------------|-------------|------------|--|
| Start Time   | 2017-Sep-08 |              | Sat                | Sun         |             | Mon         | Tue         |             | Wed         | Thu         |             | Average Day  |             |              |             |             |            |  |
|              | A.M.        | P.M.         |                    | A.M.        | P.M.        |             | A.M.        | P.M.        |             | A.M.        | P.M.        | A.M.         | P.M.        | A.M.         | P.M.        |             |            |  |
| 12:00        | 33          | 230          | 44                 | 271         | 41          | 214         | 15          | 216         | 23          | 233         | 22          | 208          | 34          | 208          | 30          | 226         |            |  |
| 12:15        | 33          | 232          | 24                 | 228         | 44          | 244         | 21          | 200         | 20          | 224         | 21          | 255          | 25          | 202          | 27          | 226         |            |  |
| 12:30        | 23          | 237          | 41                 | 239         | 38          | 238         | 20          | 200         | 18          | 207         | 21          | 237          | 17          | 197          | 25          | 222         |            |  |
| 12:45        | 21          | 253          | 30                 | 275         | 41          | 234         | 13          | 241         | 12          | 214         | 14          | 208          | 21          | 207          | 22          | 233         |            |  |
| 01:00        | 14          | 201          | 23                 | 235         | 38          | 232         | 4           | 222         | 15          | 198         | 18          | 215          | 10          | 213          | 17          | 217         |            |  |
| 01:15        | 14          | 263          | 27                 | 240         | 37          | 233         | 14          | 184         | 14          | 208         | 19          | 185          | 10          | 196          | 19          | 216         |            |  |
| 01:30        | 11          | 245          | 21                 | 270         | 39          | 234         | 11          | 232         | 10          | 203         | 10          | 217          | 11          | 232          | 16          | 233         |            |  |
| 01:45        | 17          | 230          | 14                 | 259         | 24          | 248         | 13          | 221         | 7           | 198         | 7           | 243          | 8           | 207          | 13          | 229         |            |  |
| 02:00        | 12          | 254          | 17                 | 275         | 25          | 253         | 12          | 225         | 11          | 233         | 15          | 228          | 14          | 206          | 15          | 239         |            |  |
| 02:15        | 14          | 254          | 19                 | 248         | 24          | 225         | 12          | 206         | 11          | 226         | 12          | 265          | 7           | 241          | 14          | 238         |            |  |
| 02:30        | 13          | 328          | 12                 | 258         | 24          | 232         | 12          | 222         | 15          | 269         | 13          | 254          | 18          | 275          | 15          | 263         |            |  |
| 02:45        | 5           | 276          | 11                 | 237         | 14          | 240         | 6           | 246         | 13          | 293         | 13          | 268          | 10          | 311          | 10          | 267         |            |  |
| 03:00        | 8           | 292          | 14                 | 259         | 12          | 258         | 13          | 259         | 13          | 273         | 18          | 301          | 9           | 286          | 12          | 275         |            |  |
| 03:15        | 16          | 303          | 12                 | 255         | 24          | 268         | 17          | 300         | 18          | 297         | 30          | 298          | 19          | 306          | 19          | 290         |            |  |
| 03:30        | 22          | 338          | 13                 | 277         | 17          | 271         | 11          | 304         | 14          | 324         | 15          | 307          | 12          | 339          | 15          | 309         |            |  |
| 03:45        | 18          | 330          | 14                 | 239         | 13          | 216         | 17          | 321         | 18          | 300         | 17          | 288          | 18          | 280          | 16          | 282         |            |  |
| 04:00        | 27          | 400          | 13                 | 260         | 20          | 249         | 22          | 371         | 27          | 364         | 26          | 335          | 26          | 349          | 23          | 333         |            |  |
| 04:15        | 34          | 381          | 22                 | 207         | 11          | 242         | 39          | 366         | 30          | 421         | 27          | 341          | 32          | 375          | 28          | 333         |            |  |
| 04:30        | 34          | 346          | 17                 | 212         | 13          | 230         | 34          | 376         | 28          | 381         | 34          | 394          | 39          | 372          | 28          | 330         |            |  |
| 04:45        | 52          | 371          | 21                 | 225         | 19          | 226         | 59          | 390         | 64          | 369         | 55          | 365          | 61          | 366          | 47          | 330         |            |  |
| 05:00        | 85          | 393          | 21                 | 211         | 9           | 233         | 86          | 422         | 92          | 368         | 83          | 406          | 88          | 411          | 66          | 349         |            |  |
| 05:15        | 101         | 382          | 44                 | 229         | 23          | 224         | 122         | 386         | 119         | 416         | 115         | 408          | 111         | 363          | 91          | 344         |            |  |
| 05:30        | 169         | 389          | 51                 | 195         | 30          | 173         | 184         | 392         | 217         | 377         | 204         | 391          | 180         | 406          | 148         | 332         |            |  |
| 05:45        | 179         | 323          | 49                 | 204         | 26          | 218         | 209         | 296         | 197         | 327         | 214         | 322          | 215         | 334          | 156         | 289         |            |  |
| 06:00        | 183         | 313          | 49                 | 173         | 28          | 185         | 187         | 300         | 194         | 282         | 202         | 306          | 187         | 304          | 147         | 266         |            |  |
| 06:15        | 244         | 271          | 54                 | 169         | 42          | 185         | 255         | 254         | 257         | 292         | 254         | 265          | 258         | 292          | 195         | 247         |            |  |
| 06:30        | 266         | 241          | 79                 | 165         | 44          | 165         | 296         | 265         | 256         | 218         | 291         | 271          | 280         | 241          | 216         | 224         |            |  |
| 06:45        | 257         | 227          | 87                 | 158         | 37          | 173         | 298         | 180         | 323         | 217         | 277         | 231          | 247         | 227          | 218         | 202         |            |  |
| 07:00        | 251         | 188          | 70                 | 154         | 56          | 176         | 282         | 187         | 281         | 188         | 275         | 195          | 301         | 198          | 217         | 184         |            |  |
| 07:15        | 338         | 192          | 102                | 135         | 46          | 174         | 308         | 153         | 357         | 162         | 351         | 206          | 364         | 185          | 267         | 172         |            |  |
| 07:30        | 355         | 177          | 111                | 156         | 69          | 167         | 380         | 164         | 388         | 184         | 363         | 159          | 328         | 179          | 285         | 169         |            |  |
| 07:45        | 328         | 172          | 137                | 152         | 64          | 181         | 351         | 142         | 347         | 191         | 323         | 159          | 351         | 143          | 272         | 163         |            |  |
| 08:00        | 293         | 149          | 119                | 148         | 72          | 157         | 295         | 109         | 323         | 126         | 356         | 138          | 321         | 152          | 254         | 140         |            |  |
| 08:15        | 283         | 149          | 149                | 147         | 80          | 151         | 292         | 136         | 292         | 142         | 315         | 153          | 291         | 169          | 243         | 150         |            |  |
| 08:30        | 273         | 135          | 169                | 148         | 120         | 145         | 278         | 103         | 290         | 147         | 273         | 158          | 275         | 161          | 240         | 142         |            |  |
| 08:45        | 286         | 126          | 163                | 132         | 101         | 128         | 298         | 75          | 252         | 115         | 287         | 118          | 298         | 128          | 241         | 117         |            |  |
| 09:00        | 245         | 145          | 163                | 133         | 129         | 128         | 259         | 92          | 256         | 121         | 256         | 118          | 234         | 122          | 220         | 123         |            |  |
| 09:15        | 245         | 113          | 173                | 135         | 155         | 103         | 235         | 94          | 242         | 95          | 232         | 88           | 219         | 114          | 214         | 106         |            |  |
| 09:30        | 204         | 113          | 250                | 108         | 144         | 101         | 228         | 83          | 242         | 82          | 260         | 97           | 206         | 105          | 219         | 98          |            |  |
| 09:45        | 209         | 91           | 201                | 119         | 163         | 76          | 219         | 79          | 245         | 75          | 224         | 91           | 231         | 86           | 213         | 88          |            |  |
| 10:00        | 222         | 84           | 181                | 110         | 166         | 65          | 201         | 80          | 223         | 62          | 208         | 63           | 207         | 84           | 201         | 78          |            |  |
| 10:15        | 225         | 80           | 176                | 94          | 182         | 57          | 184         | 63          | 237         | 69          | 212         | 60           | 204         | 75           | 203         | 71          |            |  |
| 10:30        | 201         | 71           | 217                | 109         | 191         | 49          | 213         | 44          | 189         | 49          | 210         | 74           | 225         | 72           | 207         | 67          |            |  |
| 10:45        | 235         | 74           | 236                | 85          | 176         | 52          | 208         | 47          | 213         | 55          | 212         | 71           | 203         | 53           | 212         | 62          |            |  |
| 11:00        | 232         | 85           | 210                | 82          | 210         | 48          | 225         | 51          | 193         | 41          | 189         | 59           | 215         | 50           | 211         | 59          |            |  |
| 11:15        | 249         | 60           | 246                | 70          | 218         | 35          | 191         | 39          | 181         | 44          | 191         | 52           | 217         | 38           | 213         | 48          |            |  |
| 11:30        | 228         | 66           | 240                | 62          | 225         | 30          | 209         | 32          | 199         | 32          | 222         | 50           | 213         | 52           | 219         | 46          |            |  |
| 11:45        | 237         | 38           | 229                | 56          | 228         | 27          | 198         | 19          | 190         | 26          | 203         | 44           | 220         | 0            | 215         | 30          |            |  |
| <b>Total</b> | <b>7044</b> | <b>10611</b> | <b>4385</b>        | <b>8808</b> | <b>3552</b> | <b>8393</b> | <b>7056</b> | <b>9589</b> | <b>7176</b> | <b>9938</b> | <b>7209</b> | <b>10165</b> | <b>7090</b> | <b>10112</b> | <b>6214</b> | <b>9657</b> |            |  |
| Day          | 17655       |              | 13193              |             | 11945       |             | 16645       |             | 17114       |             | 17374       |              | 17202       |              | 15871       |             |            |  |
| Total%       | 39.9%       | 60.1%        | 33.24%             | 66.76%      | 29.74%      | 70.26%      | 42.39%      | 57.61%      | 41.93%      | 58.07%      | 41.49%      | 58.51%       | 41.22%      | 58.78%       | 39.15%      | 60.85%      |            |  |
| Splits Peak  | 07:15       | 04:45        | 11:15              | 01:30       | 11:45       | 02:45       | 07:15       | 04:45       | 07:15       | 04:15       | 07:15       | 04:30        | 07:15       | 04:45        | 06:45       | 03:00       |            |  |
| Vol.         | 1314        | 1535         | 986                | 1052        | 924         | 1037        | 1334        | 1590        | 1415        | 1539        | 1393        | 1573         | 1364        | 1546         | 5594        | 6436        |            |  |
| P.H.F.       | 0.93        | 0.98         | 0.91               | 0.96        | 0.95        | 0.96        | 0.88        | 0.94        | 0.91        | 0.91        | 0.96        | 0.96         | 0.94        | 0.94         | 0.7         | 0.74        |            |  |



## R2 Daytime Minimum

STAMSON 5.0                    NORMAL REPORT                    Date: 18-05-2022 15:27:03  
MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r2\_day.te                    Time Period: 1 hours  
Description: Predicted sound level during minimum daytime traffic hour at R2.

Road data, segment # 1: Hwy47

-----  
Car traffic volume : 357 veh/TimePeriod  
Medium truck volume : 16 veh/TimePeriod  
Heavy truck volume : 25 veh/TimePeriod  
Posted speed limit : 70 km/h  
Road gradient : 2 %  
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: Hwy47

-----  
Angle1    Angle2                    : -90.00 deg    0.00 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: Hwy47

-----  
Source height = 1.58 m

ROAD (0.00 + 59.74 + 0.00) = 59.74 dBA  
Angle1 Angle2    Alpha RefLeq    P.Adj    D.Adj    F.Adj    W.Adj    H.Adj    B.Adj    SubLeq  
-----  
-90        0        0.57    68.77    0.00    -4.72    -4.31    0.00    0.00    0.00    59.74  
-----

Segment Leq : 59.74 dBA

Total Leq All Segments: 59.74 dBA

TOTAL Leq FROM ALL SOURCES:                    59.74



ACOUSTICS



NOISE



VIBRATION