**APPENDIX I**

# Noise Assessment Report

MINISTRY OF TRANSPORTATION ONTARIO

# NOISE ASSESSMENT REPORT

## HIGHWAY 401 PLANNING STUDY FROM COLBORNE TO BRIGHTON (GWP 4054-17-00) PRELIMINARY DESIGN AND ENVIRONMENTAL ASSESSMENT

DECEMBER 12, 2023

# NOISE ASSESSMENT REPORT

## HIGHWAY 401 PLANNING STUDY FROM COLBORNE TO BRIGHTON (GWP 4054-17-00) PRELIMINARY DESIGN ENVIRONMENTAL ASSESSMENT

MINISTRY OF TRANSPORTATION ONTARIO

REV2

PROJECT NO.: 17M-01712-11
CLIENT REF: GWP 4054-17-00
DATE: DECEMBER 12, 2023

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The conclusions presented in this report are based on work performed by trained, professional and technical staff, in accordance with their reasonable interpretation of current and accepted engineering and scientific practices at the time the work was performed.

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# DOCUMENT CONTROL PAGE

| | |
|---|---|
| **PROJECT NAME:** | **HIGHWAY 401 WIDENING AND REHABILITATION OF STRUCTURES FROM 0.8 KM EAST OF PERCY STREET TO 0.4 KM WEST OF CHRISTIANI ROAD 4016-E-0034** |
| **WSP PROJECT NUMBER:** | **17M-01712-00** |
| **MTO GWP NUMBER:** | **4054-17-00** |
| **CLIENT:** | **Ministry of Transportation Ontario (MTO)** |
| **PROJECT TEAM:** | **Kana Ganesh, MSc., PhD, P.Eng.**<br>**Zane Charran, MESc., E.I.T.**<br>**Hayley Cahill, B.Sc.** |
| **VERSION:** | **FINAL REV2**<br>(Revision Summary: Following MTO's review of Rev0 updates were included as requested such as updated NSAs and receptors and calibration with TNM.<br>Following MTO's review of RevA, updates to NSAs and receptors were included as requested) |
| **DATE:** | **December 12, 2023** |

# EXECUTIVE SUMMARY

WSP Canada Inc. (WSP) was retained by the Ontario Ministry of Transportation (MTO) to undertake a Planning, Preliminary Design and Class Environmental Assessment (Class EA) for the replacement and rehabilitation of structures, establishing the future footprint of Highway 401 from four lanes to an interim six lanes and ultimate eight lanes from 0.8 km east of Percy Street to 0.4 km west of Christiani Road (GWP 4054-17-00). As a conservative approach, the predictable worst-case of 8 lanes scenario (ultimate) was assessed in this report. The Project was carried out as a Group 'B' undertaking under the MTO Class EA for Provincial Transportation Facilities (2000).

Technically preferred design for its future operation and construction noise impact in the noise sensitive areas was assessed in this report. The potential noise impact due to the operational improvements are from future traffic on the improved and realigned corridors and was assessed in accordance with the MTO's "Environmental Guide for Noise", February 2022 (the MTO's Guide). The following Ontario Ministry of the Environment guidelines such as NPC 118 "Motorized Conveyances", NPC-115 "Construction Equipment", etc., were indirectly complied within this study and are referenced within the MTO guide; therefore, may not be directly referenced.

The study assumptions and input parameters are discussed throughout the report; this includes the following:

- road alignment and gradient in **Section 1.1** and **Appendix A**.
- Traffic data including commercial vehicle percentage, medium/heavy truck split and posted speed in **Section 4.1**.
- Assessment methodology in **Section 3.2** and **Section 4.1**.
- Topographical features and barriers in **Section 4.2**, including existing noise berms or topographic features east of Lake Road on the south side of Highway 401 (Little Lake area).
- Receptor locations, elevations and heights in **Section 3.1**.

The results and analysis are presented in **Section 4**. The analysis was completed using TNM available within CADNA/A software and a calibration of the use of this software is presented within **Section 3.2**. The noise resulting from the Project's construction activities was considered as well in this assessment.

The analysis indicated that both the future traffic noise results in the future no build and future with build scenarios exceeded 65 dBA. A further investigation of noise barriers to mitigate sound level indicated that such barriers are not economically feasible. Therefore, the report concluded that noise control barriers are not feasible for this Project in accordance with the MTO guide.

Construction Noise from General Construction was also reviewed and discussed. Refer to **Section 5** for general recommendations; in summary there is low potential for a significant impact on the acoustic environment due to construction activities during daytime hours. A complaint management process is recommended when construction is occurring during nighttime hours in the vicinity of receptors.

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## APPENDICES

# 1 INTRODUCTION

The Ontario Ministry of Transportation (MTO) has retained WSP Canada Inc. (WSP) to undertake a Planning, Preliminary Design and Class Environmental Assessment (Class EA) Study (the Project) for the replacement and rehabilitation of structures, establishing the future Highway 401 footprint for an interim six lanes and ultimate eight lanes from 0.8 km east of Percy Street to 0.4 km west of Christiani Road (GWP 4054-17-00) (The Project Study Area or PSA). The Project is being carried out in accordance with the MTO Class Environmental Assessment for Provincial Transportation Facilities (2000) as a Group 'B' undertaking. Accordingly, this noise assessment considers the technically preferred design for its future operation and construction noise impact in the noise sensitive areas.

## 1.1 PROJECT DESCRIPTION

The Project Study Area includes Highway 401 from 0.8 km east of Percy Street to 0.4 km west of Christiani Road as shown in **Figure 1.** The Brighton Car Park is **a** commuter parking lot and is located at the intersection of County Road 30 and Highway 401 at 15336 Telephone Road within the PSA. This lot is used for carpool as well as generic commuter usage and can park 46 vehicles with two handicap spaces. It is understood that a previous Environmental Assessment completed in 2005 for the intersection of County Road 30 and Highway 401 and it is not part of this Project (see **Appendix A**). However, the commuter parking lot is part of this study due to proposed improvements. The following improvements are planned for the Project:

- Replacement of structures within the project limits, which are approaching the end of their service life with new bridges planned to have a service life of 75 years.
- Widening of structures to provide sufficient room for the traffic staging for future rehabilitation projects.
- Widening from four lanes to an interim six lanes, and future eight lanes.
- Commuter parking lot improvements

The existing conditions within the PSA consists of the existing four lanes along with sections of passing lanes with traffic travelling in both eastbound and westbound directions. As noted the Project includes replacement and rehabilitation of structures, establishing the future Highway 401 footprint for an interim six lanes and ultimate eight lanes to address current and future transportation needs from 0.8 km east of Percy Street to 0.4 km west of Christiani Road and commuter parking lot improvements. The major proposed changes include the transition of the existing lanes to become westbound lanes, and the addition of two new lanes separated from the existing roadway to be built to the east of the existing lanes for eastbound traffic near the Lake Road overpass. These additional lanes begin slightly east of the existing lanes approximately 17 + 000 marker to the 18 + 500 marker as shown in the imagery attached in **Appendix A**. In this segment the alignment deviates considerably northward away from receptors located to the south.

Future operation/traffic noise after the improvements have the potential to change the future acoustical environment, while the Project's construction has the potential to influence the environment during construction. Therefore, WSP has considered the acoustical effect of future traffic noise, as well as proposed construction in this assessment.

## 1.2 STUDY OBJECTIVES

This noise assessment considered the noise impact resulting from the proposed operational improvements and construction at areas adjacent to the Noise Sensitive Areas (NSAs) within the PSA. The potential noise impact due to the operational improvements are from future traffic on the improved and realigned corridors and was assessed in accordance with the MTO's "Environmental Guide for Noise", February 2022 (the MTO's Guide). The noise resulting from the Project's construction activities was considered as well in this assessment. The methodology, findings, conclusions, and recommendations of this noise assessment are presented in the subsequent sections of this report.

# 2 ASSESSMENT GUIDELINES

Noise is considered a pollutant under the Ontario Environmental Protection Act; therefore, the Project requires a noise assessment to identify and mitigate potential impacts. The environmental noise from transportation sources in freeways such as Highway 401 are typically assessed using 24-hour equivalent sound level (Leq 24hr) and transportation sources for all other classes of highways and arterial roads are typically assessed based on a 16-hour daytime continuous sound level (Leq 16hr). However, it is understood that for all roads, a 24-hour period is to be used when 24 hour traffic counts are available. In cases where 24-hr counts are not available, then 16-hr data can typically be used only for other highways and arterial roads (i.e. non-freeways).

The sound level LAeq is defined as the steady A-weighted sound level having the same total sound energy over a specified period of time (i.e., 24-hour, 16-hour or 8-hour period) as the time varying sound over the same period. Sound levels in the A-weighted decibel scale (dBA) approximate the average human perception of sound and are therefore considered in the guidelines.

It should be noted that although environmental noise in this report is represented by A-weighted decibels (dBA), a difference between two A-weighted sound levels is reported in decibels (dB); in other words, a change (i.e., increase or decrease) in sound level is always reported in decibels (dB). This section focuses on the criteria considered in this assessment for future traffic noise, construction noise as well as noise and vibration from blasting.

## 2.1 NOISE FROM OPERATION/FUTURE TRAFFIC

As discussed, the MTO's Guide provides guidelines for assessing the potential noise impact due to highway and freeway improvement projects. The MTO's Guide is based on assessing future outdoor noise (e.g., 10 years after the construction of the project/undertaking). In determining the noise impact, it requires consideration of future sound levels at the outdoor living area (OLA) of NSAs. NSAs are defined as groups of noise sensitive land uses. A noise sensitive land use is defined as a land use with an OLA associated with them as further discussed within this report. The OLA is an area at ground level, adjacent to a noise sensitive land use with the intended use of enjoyment of the outdoor environment. This can include backyards, swimming pools, patios, etc. The OLA is typically located in the rear yard and may include shielding from the building, where applicable; however, the side of the house closest to the highway should be assumed as the OLA if it is not clearly identifiable. Additionally, noise impacts are assessed at the OLA of a receptor which are evaluation points within an NSA representing up to 3 acoustically similar noise sensitive land use locations within the NSA (i.e. representative receptor).

As per the MTO's Guide, the assessment of noise impact includes two components/steps:

- Step #1 – Estimate the future sound level at the OLA of the representative receptor of the noise sensitive land use within the NSAs for both "Future No-Build" and "Future Build" scenarios. "Future No-Build" is the scenario without the project undertaking, whereas "Future Build" is the scenario with the project undertaking and no noise mitigation. If the assessment predicts that the overall sound level is less than 65 dBA and the change in sound level between the "Future No-Build" and "Future Build" scenarios is less than 5 dB, then no noise mitigation needs to be considered (**Table 1**).
- Step #2 – If the assessment predicts that the overall sound level is greater than or equal to 65 dBA and/or the change in sound level is greater than or equal to 5 dB, then mitigation should be investigated along with its feasibility as per the MTO's Guide (**Table 2**).

The MTO's Guide is summarized in **Table 1** and **Table 2**.

Table 1: MTO Environmental Guide for Noise – Criteria for Mitigation

| Change in Noise Level due to Proposed Improvements / Projected Future Build Noise Levels | Mitigation Effort Required |
|---|---|
| Projected Sound Level of "Future Build" scenario is less than 65 dBA<br>AND<br>Change in Sound Level above the "Future No-Build" scenario is less than 5 dB | - None |
| Projected Sound Level of "Future Build" scenario is greater than or equal to 65 dBA<br>AND/OR<br>Change in Sound Level above the "Future No-Build" scenario is greater than or equal to 5 dB | Noise control to achieve acceptable sound level at the OLA shall be investigated as follows:<br>- Investigate noise control measures on right-of-way (ROW)<br>- Introduce noise control measures within ROW and mitigate to "Future No-Build" noise levels if technically, economically and administratively feasible<br>- Noise control measures, where introduced, should achieve a minimum of 5 dBA attenuation averaged over first row receptors |

Table 2: MTO Environmental Guide for Noise – Technical, Economic and Administrative Feasibility

| | |
|---|---|
| Technical Feasibility | Review the constructability of the noise mitigation (i.e. design of wall, roadside safety, shadow effect, topography, achieve at least a 5 dB reduction, ability to provide a continuous barrier, etc.). |
| Economic Feasibility | Carry out a cost/benefit assessment of the noise mitigation (i.e., determine cost per benefited receiver). |
| Administrative Feasibility | Determine the ability to locate the noise mitigation on lands within public ownership (i.e., provincial or municipal right-of-way). |

## 2.2 NOISE FROM CONSTRUCTION

In accordance with the MTO Guide, construction activities are to be carried out in a way to minimize noise levels and a process for dealing with complaints during construction must be identified.

Construction activities will include the operation of several types of general road construction machinery, such as roller, milling machine, dump trucks, sweeper, paver. This section focuses on the noise from the use of general road construction machinery. Such machinery typically does not create vibration and therefore was not considered.

Due to the temporary nature of construction noise, the MTO's Guide does not provide a noise limit for construction noise. In place of a limit, it requires consideration of the following:

1. Potential noise impact of construction equipment on NSAs;
2. Location of NSAs in relation to the construction area;
3. Timing and hours of construction; and,
4. Technical and economic feasibility of various alternatives and appropriate construction noise control measures.

At this stage of the design, the detailed construction schedule and equipment usage are not available; therefore, general assumptions regarding construction staging and equipment were used to predict the potential construction noise impact on NSAs.

The Project NSAs are located within the Township of Cramahe and Brighton; the municipal bylaws of Cramahe (Colborne region) prohibit noise from construction work between the hours of 20:00 to 7:00 as per by-law 06-71 "The Noise By-law", which is considered to apply for the general public. Municipal bylaws for Brighton township prohibit noise from construction work between the hours of 21:00 to 7:00 as per Noise by-law 118-2017. Although these townships are governed by their own noise by-laws the MTO is exempt from such requirements for municipal noise by-laws. The MTO recognizes the impacts that construction related noise may have on community and best practices for construction noise management are further discussed in **Section 5**.

# 3 NOISE ASSESSMENT METHOD

This section describes noise sensitive areas and noise assessment methods for future traffic noise, construction noise as well as noise and vibration from blasting.

## 3.1 NOISE SENSITIVE AREAS (NSA)

As discussed previously, an NSA is defined as a group of noise sensitive land uses with OLAs associated with them. In accordance with the MTO Guide, NSAs are differentiated between two types: Traditional NSAs (e.g. residences) and Special Land Use NSAs (e.g. educational facilities).

Traditional NSAs include:

- Private homes such as single-family residences.
- Townhouses;
- Multiple unit buildings, such as apartments, with OLAs for use by all occupants; and,
- Hospitals and nursing homes where there are OLAs for patients/residents.

The following may also qualify as Special Land Use NSAs if they are part of a community:

- Educational facilities and day care centres, where there are OLA's for students;
- Campgrounds that provide overnight accommodation;
- Hotels/motels where there are OLAs' (i.e. swimming pool area, etc.) for visitors;
- Community centres with OLAs (e.g. outdoor basketball courts, etc.);
- Municipal parks (excluding golf courses and trails); and,
- Places of worship with OLAs.

The project Study Area was established extending 600 metres from the proposed alignments, this area is considered as the Project Noise Limits, and was considered in the assessment as shown in **Figure 2A** for roads between County Road 25 and County Road 30, and **Figure 2B** for roads between County Road 30 and County Road 40.

NSAs within the Project Noise Limits were identified based on a review of land uses and aerial imagery.

- Areas to the east of County Road 25 (Percy Street) contain sparsely populated residential dwellings to the north and south of Highway 401. The density of dwellings significantly decreases after a 6km stretch until the County Road 30 intersection (**Figure 3-1 to 3-3**).
- From County Road 30 to the end of the study area, approximately 400m west of Christiani Road, the NSAs are scattered along a 4.5km stretch with all but one located south of Highway 401.

For the purpose of this assessment, 90 properties were considered as representative receptors of the 305 noise sensitive land uses within the Study Area. The identified noise receptors represent the OLA of the representative dwellings. The location of receptors was determined following the MTO's Guide at 3.0 metres from the façade and at a height of 1.5 metres above the existing grade. The receptor locations are shown in **Figure 3-1 to 3-3** and **Table 3** summarizes the receptors along with the represented noise sensitive land uses. Areas with no noise sensitive areas, such as industrial plazas, vacant land masses, and areas dismissed from the study (noted in Section 1.1) are depicted in **Figures 3-1 to 3-3**.

**Table 3: Summary of Representative Receptors**

| NSA | RECEPTOR | DESCRIPTION OF NOISE SENSITIVE LAND USES |
|---|---|---|
| NSA01 | R01 | Residential Building with OLA |
| | R02 | Residential Building with OLA |
| NSA02 | R03 | Residential Building with OLA |
| | R04 | Residential Building with OLA |
| | R05 | Residential Building with OLA |
| | R06 | Residential Building with OLA |
| | R07 | Residential Building with OLA |
| | R08 | Residential Building with OLA |
| | R09 | (Second Row) Residential Building with OLA |
| | R10 | (Second Row) Residential Building with OLA |
| | R11 | Residential Building with OLA |
| | R12 | Residential Building with OLA |
| NSA 03 | R13 | Residential Building with OLA |
| | R14 | Residential Building with OLA |
| | R15 | Residential Building with OLA |
| | R16 | Residential Building with OLA |
| | R17 | Residential Building with OLA |
| | R18 | Residential Building with OLA |
| | R19 | Residential Building with OLA |
| | R20 | Residential Building with OLA |
| | R21 | Residential Building with OLA |
| | R22 | Residential Building with OLA |
| | R23 | Residential Building with OLA |
| | R24 | Residential Building with OLA |
| | R25 | Residential Building with OLA |
| | R26 | Residential Building with OLA |
| | R27 | Residential Building with OLA |

| NSA | RECEPTOR | DESCRIPTION OF NOISE SENSITIVE LAND USES |
|---|---|---|
| | R28 | Residential Building with OLA |
| | R29 | Residential Building with OLA |
| | R30 | Residential Building with OLA |
| | R31 | Residential Building with OLA |
| | R32 | Residential Building with OLA |
| | R33 | Residential Building with OLA |
| NSA04 | R34 | Residential Building with OLA |
| | R35 | Residential Building with OLA |
| NSA05 | R36 | Residential Building with OLA |
| | R37 | Residential Building with OLA |
| | R38 | (Second Row) Residential Building with OLA |
| | R39 | (Second Row) Residential Building with OLA |
| | R40 | Residential Building with OLA |
| | R41 | Residential Building with OLA |
| | R42 | Residential Building with OLA |
| | R43 | Residential Building with OLA |
| | R44 | Residential Building with OLA |
| | R45 | Residential Building with OLA |
| | R46 | Residential Building with OLA |
| | R47 | Residential Building with OLA |
| | R48 | Residential Building with OLA |
| | R49 | (Second Row) Residential Building with OLA |
| | R50 | (Second Row) Residential Building with OLA |
| | R51 | Residential Building with OLA |
| NSA06 | R52 | Residential Building with OLA |
| | R53 | Residential Building with OLA |
| | R54 | Residential Building with OLA |
| | R55 | Residential Building with OLA |
| | R56 | Residential Building with OLA |

| NSA | RECEPTOR | DESCRIPTION OF NOISE SENSITIVE LAND USES |
|---|---|---|
| NSA07 | R57 | Residential Building with OLA |
| NSA08 | R58 | Residential Building with OLA |
| | R59 | Residential Building with OLA |
| | R60 | Residential Building with OLA |
| NSA09 | R61 | Residential Building with OLA |
| | R62 | Residential Building with OLA |
| | R63 | Residential Building with OLA |
| NSA10 | R64 | Residential Building with OLA |
| | R65 | Residential Building with OLA |
| NSA11 | R66 | Residential Building with OLA |
| | R67 | Residential Building with OLA |
| | R68 | (Second Row) Residential Building with OLA |
| | R69 | (Second Row) Residential Building with OLA |
| NSA12 | R70 | Residential Building with OLA |
| | R71 | Residential Building with OLA |
| | R72 | Residential Building with OLA |
| | R73 | (Second Row) Residential Building with OLA |
| | R74 | Residential Building with OLA |
| | R75 | Residential Building with OLA |
| | R76 | (Second Row) Residential Building with OLA |
| | R77 | Residential Building with OLA |
| | R78 | Residential Building with OLA |
| | R79 | Residential Building with OLA |
| | R80 | Residential Building with OLA |
| | R81 | Residential Building with OLA |
| | R82 | Residential Building with OLA |
| | R83 | Residential Building with OLA |
| | R84 | Residential Building with OLA |
| | R85 | Residential Building with OLA |

| NSA | RECEPTOR | DESCRIPTION OF NOISE SENSITIVE LAND USES |
|---|---|---|
| | R86 | Residential Building with OLA |
| NSA13 | R87 | (Second Row) Residential Building with OLA |
| NSA14 | R88 | (Second Row) Residential Building with OLA |
| | R89 | Residential Building with OLA |
| | R90 | Residential Building with OLA |

Notes:

(1) Refer to Figure 4 for Noise Sensitive Land Use locations

## 3.2 OPERATION/FUTURE TRAFFIC NOISE

The noise impact from a transportation corridor depends on several parameters (i.e. traffic volume, speed, road surface, etc.) as well as the location of the noise receptors. The MTO's Guide provides an assessment methodology, the study area, traffic parameters and assessment locations for receptors. These are discussed in this section.

Project Noise Limits were established extending 600 metres from the proposed alignments, this area was considered in the assessment as shown in **Figure 2A** and **Figure 2B**. The primary noise sources included in the noise modelling within the Study Area are vehicular traffic noise from Highway 401, and construction noise sources during Project construction. The Project Construction Limits are shown in **Figure 2A** and **Figure 2B**.

The MTO's Guide requires that future sound levels from the proposed undertaking are estimated and assessed using noise prediction methodologies approved by the MECP.

The MECP updated their guidance requiring the use of up-to-date noise prediction methods and software for determining the impacts of noise from roads and railways (Publication NPC-306 "Methods to Determine Sound Levels Due to Road and Rail Traffic" December 2021). The Publication NPC-306 replaces Publication NPC-206 "Sound Levels Due to Road Traffic", dated October 1995.

Although Publication NPC-306 is in circulation for comments as draft, it authorizes the use of other software provided that a sample calculation can be provided showing similar results. This assessment therefore uses the updated guidance set out in NPC-306 to account for complex features of the Project (topography etc.,).

The future road traffic sound levels were predicted using the commercially available software package Cadna/A, a computer implementation of the algorithms ISO Standard 9613-2 "Acoustics – Attenuation of Sound During Propagation Outdoors", and Traffic Noise Model (TNM) by the Federal Highway Administration (FHWA).

Therefore, for the traffic noise prediction, the TNM algorithm was used and a calculation validation against the most recent version (Version 3.1) of the Traffic Noise Model (TNM) software is included in **Appendix B**.

The (TNM and ISO 9613) algorithms consider the source sound levels, distance attenuation, source-receptor geometry, screening provided by intervening structures, ground and air (atmospheric) attenuation, and temperature and humidity effects on noise propagation. The following parameters were taken into consideration in the model:

- Road alignments and gradients;
- Traffic volumes;
- Commercial vehicle percentages - percentage of medium trucks and heavy trucks;
- Traffic speed - the posted speed limits;
- Shielding - provided by intervening buildings, barriers and/or topographical features; and,
- Special details - barrier and receptor locations, elevations, and heights.

The FHWA TNM noise algorithm is based on parametric equations requiring variables such as vehicle volumes, speed, and percentages of heavy trucks and medium trucks or buses. As noted, the TNM predictions were verified against TNM Version 3.1 software at the existing receptor R## using available project topography. The results are considered in agreement within prediction tolerances and the prediction files and comparisons are included in **Appendix B**.

Topographic information of the Study Area was obtained from the design team and used within the model. The following methodology was used for noise assessment for future operation:

- Determine the projected future sound levels and change in sound levels (i.e. noise impact) at NSAs resulting from the proposed undertaking in accordance with the MTO's Guide; the following scenarios were considered to establish the future effect and changes in sound level:
  - Future scenario without the Project undertaking ("Future No-Build") – i.e. the future scenario due to traffic growth with the existing infrastructure (i.e. roadway alignments and profiles remain unchanged).
  - Future with the Project undertaking ("Future Build") – i.e. the future scenario due to traffic growth along with the proposed roadway alignments, profiles, interchanges etc., implemented.
- Determine mitigation requirements, if required, to demonstrate compliance with the MTO's Guide; and,
- Develop design details of noise control measures (if required) and recommendations for the design team.

The MTO's Guide requires the use of 24-hour traffic volumes for freeways and where 24-hour traffic counts are available. Alternatively, 16-hour daytime traffic volumes for other highways and arterial roads can be used where 24-hour traffic counts are not available. For this assessment, 24-hour traffic was used for Highway 401 because it falls under the MTO Guide's definition of "freeway" as a means-controlled access median divided highway facility with grade separated crossings and interchanges, and the 24-hour traffic count information is available.

A review of the available information showed an existing noise berm at the intersection of Lake Road and Highway 401 (east of Lake Road and south of Highway 401). This noise berm provides sound mitigation for NSA05 and is included in the modelling of the Project for scenarios of with undertaking and without undertaking.

## 3.3 CONSTRUCTION NOISE

At this stage of design, construction staging and details on construction machinery along with their operating schedules during the construction period are not available. The noise impact from construction depends on several parameters (i.e. construction activity, operation of equipment etc.) and the location of the noise receptors (Refer to Section 3.1 for receptors).

The MTO's Guide requires the undertaking of highway construction projects in a manner which minimizes sound levels and the identification of a process for handling public complaints during construction. If there are pile driving and blasting operations, those should be in accordance with OPSS 120 and Ministry of the Environment, Conservation and Parks (MECP) Publication NPC-119. Construction equipment shall comply with the requirements provided in MECP publication NPC-115 "Construction Equipment" and any motorized convenance related to construction shall comply with the MECP publication NPC-118 "Motorized Conveyances" for source-based noise limits.

Given that MTO is legally exempt from the requirements of municipal noise by-laws, MTO will no longer be applying for these permits. MTO recognizes the impacts that construction related noise can have on a community and will ensure clear and frequent communication with the municipality to work within the spirit of the municipal noise by-law. All reasonable attempts will be made including public notification and mitigation measures to reduce noise.

Since the construction schedule and details of construction machinery along with their operating schedules during the construction period are not available, construction was reviewed qualitatively in this assessment.

# 4 FUTURE TRAFFIC NOISE RESULTS

As discussed previously, future sound levels were predicted using CADNA/A software at the representative receptors (**Figure 3-1 to 3-3**), which are OLAs of noise sensitive land uses grouped within NSAs.

## 4.1 ROAD TRAFFIC AND OTHER DATA

As discussed, the MTO's Guide requires an assessment based on future sound level. The future is typically considered to be 10 years after construction of the undertaking. The year of construction is not known at this stage; therefore, the future traffic volumes are based on traffic data from the year 2041 as provided by the design team.

The MTO's Guide suggests the use of the higher of the Annual Average Daily Traffic (AADT) or the Summer Average Daily Traffic (SADT) volumes for estimating future sound levels. The projected SADT volumes and medium to heavy truck (refer MECP guide NPC 118 Motorized Conveyances for heavy trucks) split ratios were obtained from the design team and used in this assessment. The traffic information corresponds to the year 2041and was used in this assessment.

The traffic data provided indicated that there is no predicted difference in the future traffic volumes with and without the undertaking of the Project. Therefore, the assessment considered the future traffic volumes with and without the undertaking of the Project. The future traffic data was found to be the same for both cases. In the "Future Build" scenario the traffic volume was assumed to be an even split between the four proposed lanes for each direction.

As per MTO requirements a 24-hour traffic volume was considered. Other road parameters such as alignments and gradients were obtained from the design drawings; topography data within the Project Noise Limits were also obtained from the design drawings and existing geographical contour data.

The traffic volumes for the "Future No-Build" and "Future Build" scenarios are summarized in **Table 4**. As discussed, the traffic volumes are not expected to increase significantly due to the improvements and therefore were assumed to be the same for both scenarios.

**Table 4: Future Traffic Data**

| ROADWAY | YEAR | AADT | SADT | POSTED SPEED LIMIT (KM/H) | TRUCK PERCENTAGE (%) | MEDIUM / HEAVY TRUCK PERCENTAGE (%) |
|---|---|---|---|---|---|---|
| Highway 401 East - bound [County Road 25 to County Road 30] | 2041 | 29700 | 36200 | 100 | 10.2 | 24/76 |
| Highway 401 West - bound [County Road 25 to County Road 30] | 2041 | 30000 | 36500 | 100 | 12.8 | 14/86 |
| Highway 401 East - bound [County Road 30 to County Road 40] | 2041 | 30000 | 36600 | 100 | 10.2 | 24/76 |
| Highway 401 West - bound [County Road 30 to County Road 40] | 2041 | 30400 | 37100 | 100 | 12.8 | 14/86 |

## 4.2 ANALYSIS RESULTS

**Table 5** summarizes the predicted future sound levels at the receptor locations with and without the Project undertaking, as well as the predicted changes in the future sound levels. Cadna/A input and output sheets are attached in **Appendix C**.

**Table 5: Summary of Predicted Sound Levels**

| | | PROJECTED SOUND LEVEL RANGE YEAR 2033 (SPL) ($L_{EQ}$ 24-HR) (DBA) | | | NOISE CONTROL CONSIDERATION | | |
|---|---|---|---|---|---|---|---|
| LAND USE | LOCATION OF THE RECEPTOR | FUTURE WITHOUT PROJECT UNDERTAKING "FUTURE NO BUILD" | FUTURE WITH PROJECT UNDERTAKING "FUTURE BUILD" | PROJECTED CHANGE IN SOUND LEVEL (SPL CHANGE) (DB) | SPL ≥65 dBA | SPL CHANGE ≥5 dB | MITIGATION INVESTIGATION REQUIRED? Y/N OR N/A(1) |
| NSA 01 | OLA | 31 – 40.2 | 30.5 – 40 | 0.2 – 0.5 | X | X | N |
| NSA 02 | OLA | 54.0 – 61.4 | 54.0 – 61.4 | 0 | X | X | N |
| NSA 03 | OLA | 47.3 – 67.5 | 47.2 – 67.8 | 0.1 – 0.3 | ✓ | X | Y |
| NSA 04 | OLA | 55.2 – 57.4 | 55.1 – 56.9 | 0.1 – 0.5 | X | X | N |
| NSA 05 | OLA | 55.3 – 64.4 | 55.1 – 64.3 | 0.1 - 0.2 | X | X | N |
| NSA 06 | OLA | 53.4 – 55.6 | 53.4 – 54.6 | 1.0 | X | X | N |
| NSA 07 | OLA | 64.2 | 64.2 | 0 | X | X | N |
| NSA 08 | OLA | 57.3 – 62.2 | 57.2 – 62.1 | 0.1 | X | X | N |
| NSA 09 | OLA | 37.4 - 43.2 | 37.5 - 43.2 | 0.1 | X | X | N |
| NSA 10 | OLA | 50.7 – 58.4 | 50.6 – 58.7 | 0.1 – 0.3 | X | X | N |
| NSA 11 | OLA | 54 – 66.7 | 53.9 – 66.8 | 0.1 | ✓ | X | Y |
| NSA 12 | OLA | 53.3 – 70.1 | 53.4 – 70.1 | 0.1 | ✓ | X | Y |
| NSA 13 | OLA | 51.8 | 51.8 | 0 | X | X | N |
| NSA 14 | OLA | 52.3 – 60.2 | 52.4 – 60.2 | 0.1 | X | X | N |

Notes:

(1) Y: Yes, Mitigation investigation is required; N: No, Mitigation investigation is not required; and N/A: not applicable.

**Table 5** shows that the predicted future sound level with the undertaking of the Project is below 65 dBA for all Noise Sensitive Areas other than the following three (3): NSA 03, NSA 11 and NSA 12; and the corresponding changes in sound level are less than 5 dB for every receptor location.

Therefore, a preliminary noise control investigation was completed for the above-mentioned 3 NSAs in accordance with the MTO's Guide. The findings of the preliminary noise control are provided in the following sections.

As mentioned in **Section 3.2** noise mitigation measures for NSA 05 are provided by the noise berm located at the intersection of Lake Road and Highway 401. This noise berm provides coverage for the above-mentioned land uses, thus, no mitigation will be required for this area with Project undertaking. Additionally, this noise berm is identified under the MTO's noise barrier retrofit policy.

Detailed results are provided in **Appendix D**.

## 4.3 ASSESSMENT OF MITIGATION

Where the future sound levels are greater than or equal to 65 dBA and/or increase in sound levels greater than or equal to 5 dB are predicted, the MTO's Guide requires that noise control measures be investigated within the MTO's right-of-way (ROW). In order to be technically feasible, the mitigation measures should achieve a minimum attenuation of 5 dB averaged over the first-row receptors and mitigate as close to, or lower than, the ambient sound level. In addition, such mitigation measures should also be economically and administratively feasible.

Investigation of noise control measure was conducted for NSA 03, NSA 11, and NSA 12. Noise control measures in the form of barriers were introduced within the ROW to investigate the technical, economic, and administrative feasibility of mitigating noise levels to less than 65 dBA at the impacted receptors. The following were assumed:

- A 5-metre-high noise wall, which is consistent with the maximum height considered for MTO projects; and,
- Typical cost for installing barrier per square meter is $600 (i.e., $600/ Square meter installation cost, includes materials)
- An acceptable or reasonable value for overall barrier is $120,000/benefited receptor.

A 5-metre-high noise wall was reviewed along the ROW of the proposed Highway 401 from County Road 25 to County Road 40. The locations and alignments are shown in **Figures 4A – 4B** and labelled as "Reviewed Noise Wall #1 - #3". Summary of the review is provided in **Table 6** and **Table 7**.

**Table 6: Summary of Mitigated Sound Levels**

| BARRIER ID | RECEPTORS ON FIRST ROW (OLAS) | PROJECTED SOUND LEVEL YEAR 2041 (SPL) ($L_{EQ}$ 16-HR) (DBA) | | PROJECTED CHANGE IN SOUND LEVEL (SPL CHANGE) (DB) | AVERAGED OVER 1ST ROW OF RECEPTORS (DB) | TECHNICALLY FEASIBLE? [Y/N] (I.E. MINIMUM 5 DB REDUCTION?)(1) |
|---|---|---|---|---|---|---|
| | | FUTURE WITHOUT PROJECT UNDERTAKING "FUTURE NO BILD" | FUTURE WITH PROJECT UNDERTAKING+ Mitigation "FUTURE BUILD Mitigated" | | | |
| BR#1 | NSA 03 | 47.3 – 67.5 | 46.5 - 59.8 | 0.8 – 7.7 | 9 | Y |
| BR#2 | NSA 11 | 54 – 66.7 | 53.5 – 59.3 | 0.5 – 7.4 | 5 | Y |
| BR#3 | NSA 12 | 53.3 – 70.1 | 53.3 – 63.4 | 0 – 6.7 | 6 | Y |

Notes:

(1) Y: Yes, Mitigation investigation is required; N: No, Mitigation investigation is not required; and N/A: not applicable.

**Table 7: Summary of Feasibility Analysis**

| REVIEWED NOISE WALL #(1) | LENGTH OF NOISE WALL (M) | AVERAGE NOISE LEVEL REDUCTION OVER FIRST ROW RECEPTORS (DB) | TECHNICALLY FEASIBLE? (YES/NO) | TOTAL NOISE WALL COST ($) @ $600/SQ.M | NUMBER OF BENIFITED RECEPTORS (OVER 5 DB REDUCTION) | ESTIMATED NOISE WALL COST PER BENEFITTED HOUSE ($) | ECONOMICALLY FEASIBLE? (YES/NO) |
|---|---|---|---|---|---|---|---|
| 1 | 1370 | 9 | Yes | 4,110,000 | 18 | 228,333 | No |
| 2 | 320 | 5 | Yes | 930,000 | 1 | 930,000 | No |
| 3 | 1530 | 6 | Yes | 4,590,000 | 23 | 199,565 | No |

(1) Refer to Figure 4 for location.

No administrative feasibility issues were identified.

As shown in **Table 6** and **Table 7**, all of the reviewed noise walls are considered to be technically feasible as they provide a noise attenuation of at least 5 dB over the first-row receptors at the extended lengths listed in **Table 6** and **Table 7**. Though these barriers provide a technically feasible reduction of sound produced for their respective receptor locations, these are not considered economically feasible given their length and relative number of NSAs that will be benefitted as per the MTO's guidelines.

**Figure 5-1 to 5-3** shows the cross-section view of the reviewed noise walls, roadways, and associated receptors. As shown in **Figure 5-1 to 5-3**, the NSAs are located adjacent to the road on either side of Highway 401, whereas to be administratively feasible, the lands available for the noise walls are placed closest to the boarder of MTO's ROW and the future build roads. Since none of the noise walls are considered to be both technically and economically feasible, they are not further considered or discussed in this report.

Barrier height requirements were based on preliminary design topographic information (i.e. road elevation and ROW elevations, as well as available topographical information at the receptors. This should be reviewed once final grading plans becomes available and typically done during the detailed design stage of the project.

## 4.4 SUMMARY OF ANALYSIS

The difference in sound level between the "Future No Build" and "Future Build" scenarios was less than 5 dB for all receptor locations. The future sound level with the project undertaking ("Future Build" scenario) was less than 65 dBA for the majority of the identified NSAs apart from the following three Noise Sensitive Areas: NSA 03, NSA 11 and NSA 12.

Therefore, an assessment of noise mitigation along with a feasibility study was carried out for the three identified NSAs. Noise control was investigated considering 5 m noise barrier at the right-of-way (ROW); the investigation focused on technical, economical, and administrative feasibility.

As shown in **Table 7** above, none of the three noise walls achieved both technical and economical feasibility; therefore, the selected noise mitigation is not feasible.

# 5 CONSTRUCTION NOISE GENERAL RECOMMENDATIONS

Construction-related activities will occur throughout the project development area; however, a detailed construction schedule or equipment usage details are not available at this time for review. It is recommended to implement a complaint management process and noise mitigation measures on construction equipment/activities. These measures will include, but are not limited to:

- Where possible, major construction activities to be scheduled during daytime hours (i.e. 07:00 to 19:00), avoiding the nighttime period in the vicinity of receptors. It should be noted that the township of Brighton has municipal by-laws exempting construction noise, between the hours of 07:00 and 21:00 Monday to Saturday, as per Noise By-Law 118-2017 Section 3.1(e); therefore, the following should be considered:
    - Although MTO is legally exempt from the requirements of municipal noise bylaws, where possible, avoid major noise generating construction between the nighttime hours of 21:00 to 7:00 in the vicinity of the receptors.
- The Contractor to keep the idling of construction equipment to a minimum as necessary and to maintain equipment in good working order to reduce noise from construction activities and meet MECP guideline NPC – 115 “Construction Equipment”.
- Equipment manufacturer recommended noise mitigation measures (e.g. muffler systems) to be installed on construction equipment and equipment to be properly maintained.
- Where possible, the Contractor is to implement administrative controls such as maintaining setbacks from NSAs, plan activities considering timing constraints, or scheduling of specific construction activities to minimally disturb the NSAs.
- Where required and where practical, the contract documents shall include these best management practice guidelines and identify NSAs in the contract package using SP 199F33 or similar documents.
- Special Provisions similar to the MTO’s 199F33 should be included in the contract documents.
- Given that MTO is legally exempt from the requirements of municipal noise bylaws, MTO will no longer be applying for these exemptions. MTO recognizes the impacts that construction related noise can have on a community and will ensure clear and frequent communication with the municipality to work within the spirit of the municipal noise by-law. All reasonable attempts will be made including public notification and mitigation measures to reduce noise.
- Provide a contact number to the local municipality for residents to call if they have any concerns or questions (typically the Contract Administrator or Contract Services Administrator).
- Provide notification of the project prior to commencement of any work advising local residents and businesses of the project timeframe and that the project may create noise in the evening and/or night. Provide notification to property owners adjacent to the worksite prior to work commencing advising of the project timeframe and that the project may create noise in the evening and/or night (e.g. door-to-door flyers). Timing should be consistent with the timelines the local municipality would normally require in a noise bylaw exemption for a project of this scope/magnitude (typically 2-4 weeks prior to work commencing and 2-4 weeks prior to work recommencing each spring).
- A construction noise complaint management process should be implemented with the following steps:

- Maintain a record of all noise complaints including date, time, location and nature of complaint.
- All complaints should be investigated by a Qualified Noise Specialist.
- Appropriate mitigation measures are to be implemented where it is technically, economically, and administratively feasible as required.

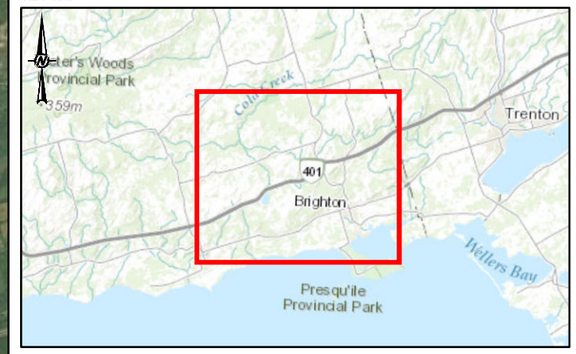
# 6 CONCLUSIONS AND RECOMMENDATIONS

This noise assessment report documents the noise impact of the replacement and rehabilitation of structures and establishing the future Highway 401 footprint for an interim six lanes and ultimate 8 lanes from 0.8 km east of Percy Street to 0.4 km west of Christiani Road (GWP 4054-17-00). The land uses within the Project Noise Limits consist of largely greenspaces and dispersed residential properties. The following provides a summary of recommendations:

- Future Traffic Noise - the results of the assessment indicated that the future no build and future with build exceeded 65 dBA at three NSAs. A further investigation of noise barriers to mitigate sound level indicated that such barriers are not economically feasible. Therefore, noise control barriers are not recommended for this Project.
- Construction Noise from General Construction – Refer to **Section 5** for general recommendations; in summary there is low potential for a significant impact on the acoustic environment due to construction activities during the daytime. A complaint management process is recommended when construction is occurring during nighttime hours in the vicinity of receptors.

# FIGURES


**KEY MAP**

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**LEGEND**

PROPJECT ALIGNMENT

RAILWAY

0 500 1,000 2,000

SCALE 1:55,000 METRES

**NOTE(S)**

1. ALL LOCATIONS ARE APPROXIMATE

**REFERENCE(S)**

1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
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3. COORDINATE SYSTEM: NAD 1983 UTM ZONE 18N

CLIENT

ONTARIO MINISTRY OF TRANSPORTATION (MTO)

PROJECT

HWY 401 COLBORNE TO BRIGHTON - ENVIRONMENTAL IMPACT ASSESSMENT REPORTING, ONTARIO

TITLE

**OVERALL PROJECT AREA**

CONSULTANT

wsp

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| YYYY-MM-DD | 2023-04-05 |
| DESIGNED | ---- |
| PREPARED | RSM |
| REVIEWED | ---- |
| APPROVED | ---- |

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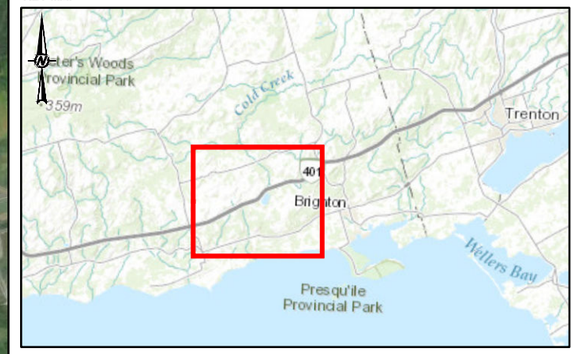
**KEY MAP**




SCALE 1:500,000

**LEGEND**

PROPJECT ALIGNMENT

RAILWAY

0 345 690 1,380

SCALE 1:35,000 METRES

**NOTE(S)**

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**REFERENCE(S)**

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ONTARIO MINISTRY OF TRANSPORTATION (MTO)

PROJECT

HWY 401 COLBORNE TO BRIGHTON - ENVIRONMENTAL IMPACT ASSESSMENT REPORTING, ONTARIO

TITLE

**PROJECT AREA COUNTY ROAD 25 TO COUNTY ROAD 30**

CONSULTANT

wsp

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| YYYY-MM-DD | 2023-04-05 |
| DESIGNED | ---- |
| PREPARED | RSM |
| REVIEWED | ---- |
| APPROVED | ---- |

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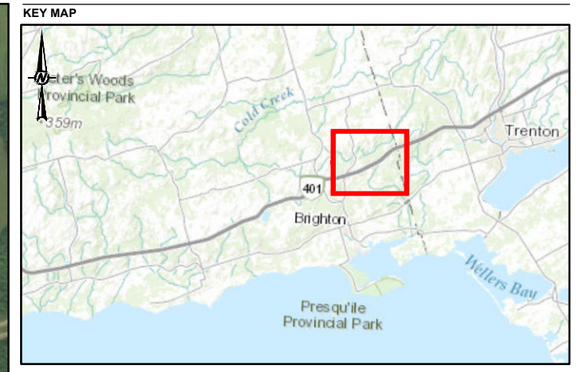


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**LEGEND**

PROPJECT ALIGNMENT

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SCALE 1:20,000 METRES

**NOTE(S)**

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PROJECT

HWY 401 COLBORNE TO BRIGHTON - ENVIRONMENTAL IMPACT ASSESSMENT REPORTING, ONTARIO

TITLE

**PROJECT AREA COUNTY ROAD 30 TO COUNTY ROAD 40**

CONSULTANT

wsp

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| YYYY-MM-DD | 2023-04-05 |
| DESIGNED | ---- |
| PREPARED | RSM |
| REVIEWED | ---- |
| APPROVED | ---- |

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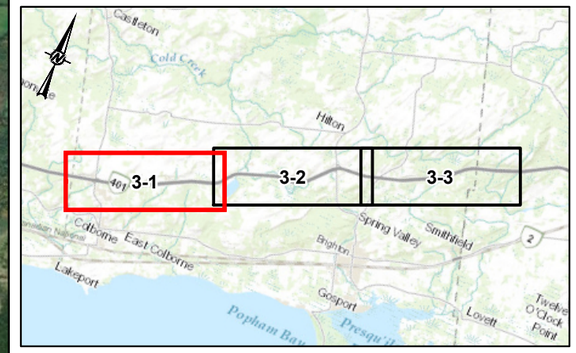
| 17M-01712-11 | 0001 | A | 2B |

KEY MAP

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LEGEND

- NOISE SENSITIVE LANDUSE
- RECEPTORS
- FUTURE ROAD BUILD
- RAILWAY
- NOISE SENSITIVE AREA
- PROJECT BOUNDARY
- INDUSTRIAL
- VACCANT

0 345 690 1,380

SCALE 1:35,000 METRES

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

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ONTARIO MINISTRY OF TRANSPORTATION (MTO)

PROJECT

HWY 401 COLBORNE TO BRIGHTON - ENVIRONMENTAL IMPACT ASSESSMENT REPORTING, ONTARIO

TITLE

**AND FUTURE ROAD BUILD**

CONSULTANT

wsp

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| YYYY-MM-DD | 2023-11-23 |
| DESIGNED | ---- |
| PREPARED | RSM |
| REVIEWED | ---- |
| APPROVED | ---- |

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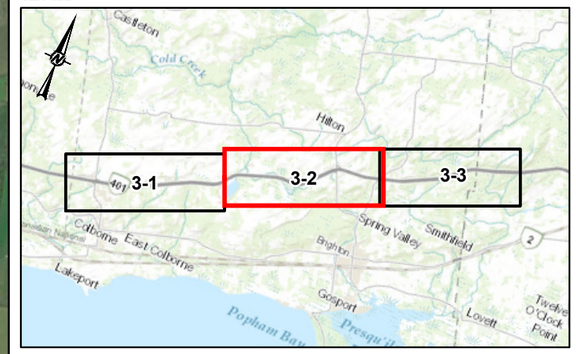


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LEGEND

- NOISE SENSITIVE LANDUSE
- RECEPTORS
- PLACES
- FUTURE ROAD BUILD
- RAILWAY
- NOISE SENSITIVE AREA
- PROJECT BOUNDARY
- DISMISSED
- VACCANT

0 345 690 1,380

SCALE 1:35,000 METRES

**NOTE(S)**

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CLIENT

ONTARIO MINISTRY OF TRANSPORTATION (MTO)

PROJECT

HWY 401 COLBORNE TO BRIGHTON - ENVIRONMENTAL IMPACT ASSESSMENT REPORTING, ONTARIO

TITLE

**AND FUTURE ROAD BUILD**

CONSULTANT

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| APPROVED | ---- |

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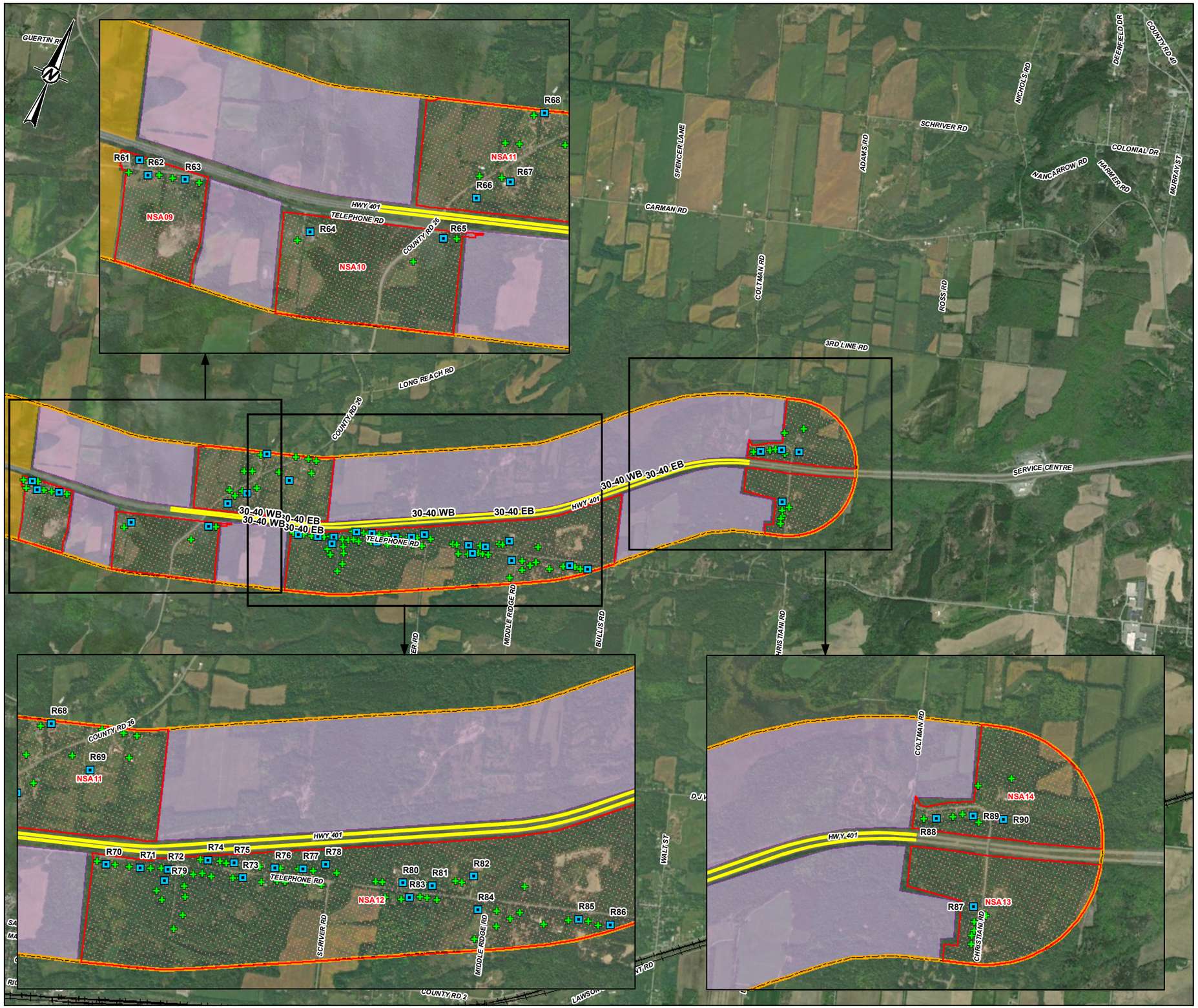


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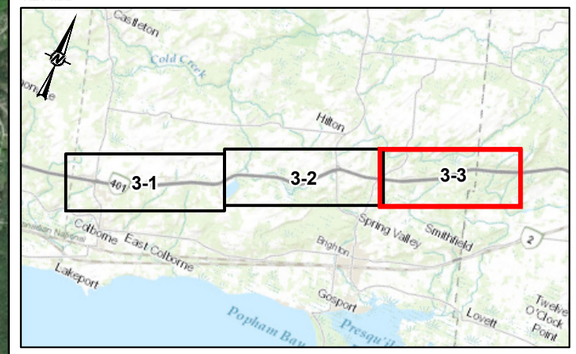


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LEGEND

- NOISE SENSITIVE LANDUSE
- RECEPTORS
- PLACES
- FUTURE ROAD BUILD
- RAILWAY
- NOISE SENSITIVE AREA
- PROJECT BOUNDARY
- DISMISSED
- VACCANT

0 345 690 1,380

SCALE 1:35,000 METRES

**NOTE(S)**

1. ALL LOCATIONS ARE APPROXIMATE

**REFERENCE(S)**

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ONTARIO MINISTRY OF TRANSPORTATION (MTO)

PROJECT

HWY 401 COLBORNE TO BRIGHTON - ENVIRONMENTAL IMPACT ASSESSMENT REPORTING, ONTARIO

TITLE

**AND FUTURE ROAD BUILD**

CONSULTANT

wsp

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| YYYY-MM-DD | 2023-11-24 |
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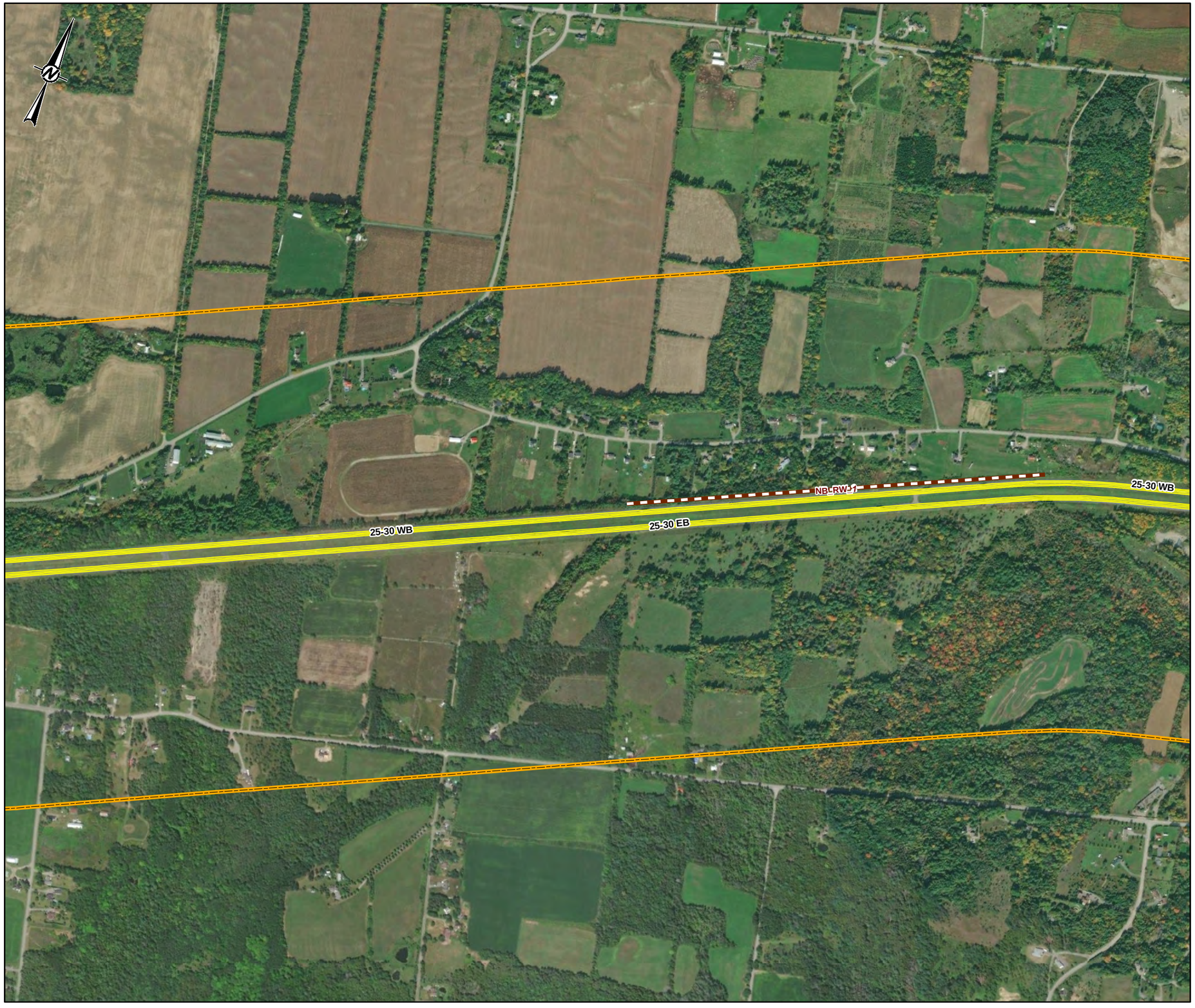
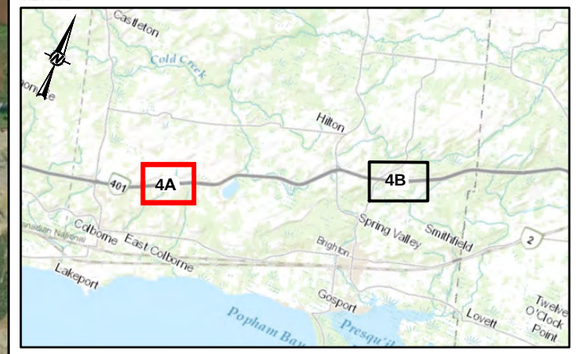



KEY MAP




SCALE 1:300,000

LEGEND

- NOISE BARRIER
- FUTURE ROAD BUILD
- 600 M STUDY AREA

0 100 200 400

SCALE 1:10,000 METRES

**NOTE(S)**

1. ALL LOCATIONS ARE APPROXIMATE

**REFERENCE(S)**

1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. IMAGERY CREDITS: SOURCES: ESRI, HERE, GARMIN, INTERMAP, INCREMENT P CORP., GEBCO, USGS, FAO, NPS, NRCAN, GEOBASE, IGN, KADASTER NL, ORDNANCE SURVEY, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), (C) OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY
   SOURCE: ESRI, MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY
3. COORDINATE SYSTEM: NAD 1983 UTM ZONE 18N

CLIENT

ONTARIO MINISTRY OF TRANSPORTATION (MTO)

PROJECT

HWY 401 COLBORNE TO BRIGHTON - ENVIRONMENTAL IMPACT ASSESSMENT REPORTING, ONTARIO

TITLE

**COUNTY ROAD 25 TO COUNTY ROAD 30 NOISE BARRIERS AND FUTUE ROAD BUILD**

CONSULTANT

wsp

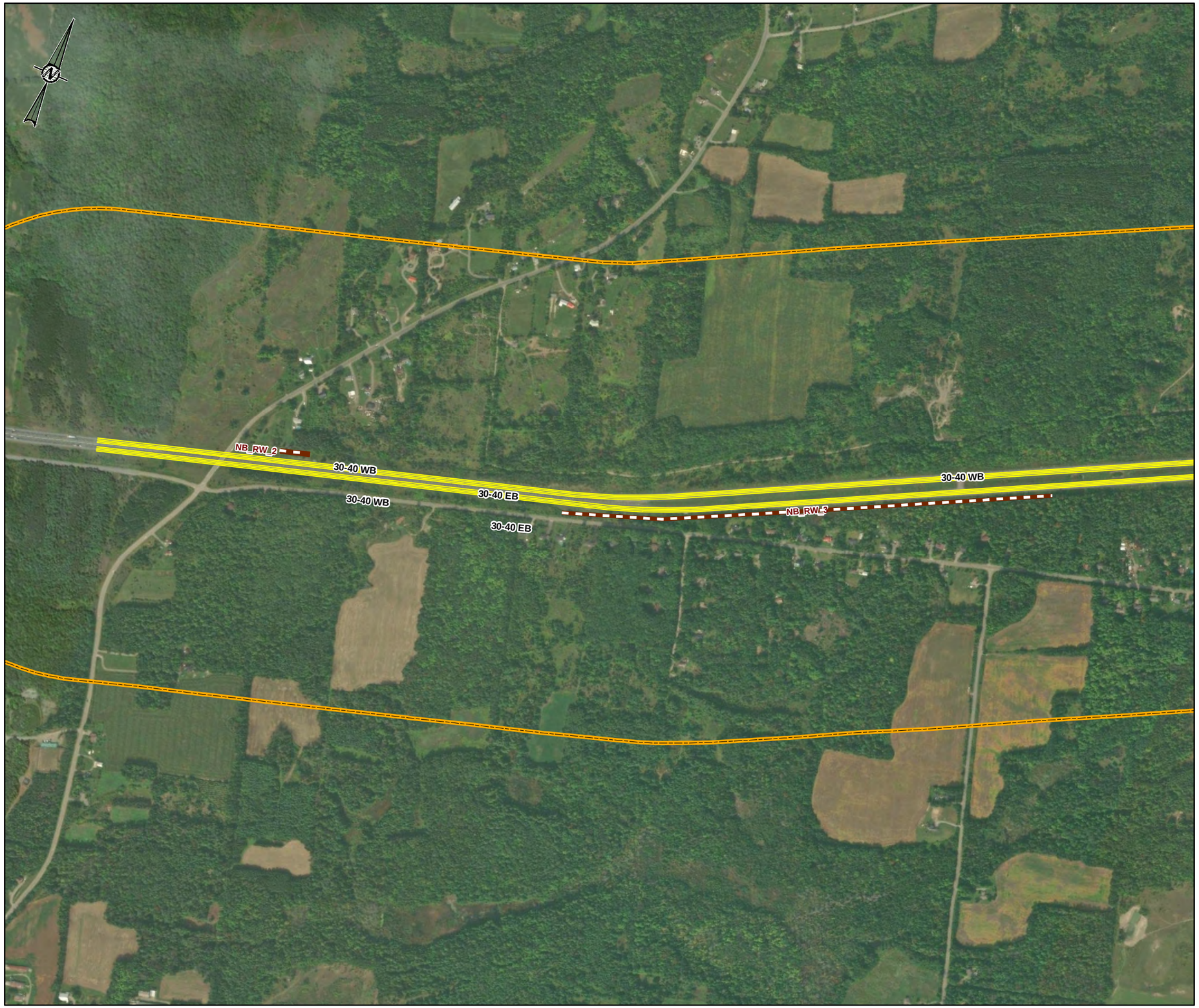
| | |
|---|---|
| YYYY-MM-DD | 2023-09-10 |
| DESIGNED | ---- |
| PREPARED | JJ |
| REVIEWED | ---- |
| APPROVED | ---- |

| PROJECT NO. | CONTROL | REV. | FIGURE |
|---|---|---|---|
| 17M-01712-11 | 0001 | A | 4A |

PATH: S:\Client\MTO\Hwy_401_Colborne_to_Brighton\99_PRO\17M-01712-11_EIAAD_PROD\0001 Noise\17M-01712-11-0460-HS-0004.mxd PRINTED ON: 2023-04-12 AT 8:32:22 PM

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

0 25mm




**KEY MAP**


SCALE 1:300,000

**LEGEND**

- NOISE BARRIER
- FUTURE ROAD BUILD
- 600 M STUDY AREA

0 100 200 400

SCALE 1:10,000 METRES

**NOTE(S)**

1. ALL LOCATIONS ARE APPROXIMATE

**REFERENCE(S)**

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2. IMAGERY CREDITS: SOURCES: ESRI, HERE, GARMIN, INTERMAP, INCREMENT P CORP., GEBCO, USGS, FAO, NPS, NRCAN, GEOBASE, IGN, KADASTER NL, ORDNANCE SURVEY, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), (C) OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY
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CLIENT

ONTARIO MINISTRY OF TRANSPORTATION (MTO)

PROJECT

HWY 401 COLBORNE TO BRIGHTON - ENVIRONMENTAL IMPACT ASSESSMENT REPORTING, ONTARIO

TITLE

**COUNTY ROAD 25 TO COUNTY ROAD 30 NOISE BARRIERS AND FUTUE ROAD BUILD**

CONSULTANT

wsp

| | |
|---|---|
| YYYY-MM-DD | 2023-09-10 |
| DESIGNED | ---- |
| PREPARED | JJ |
| REVIEWED | ---- |
| APPROVED | ---- |

| PROJECT NO. | CONTROL | REV. | FIGURE |
|---|---|---|---|
| 17M-01712-11 | 0001 | A | 4B |

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

0 25mm

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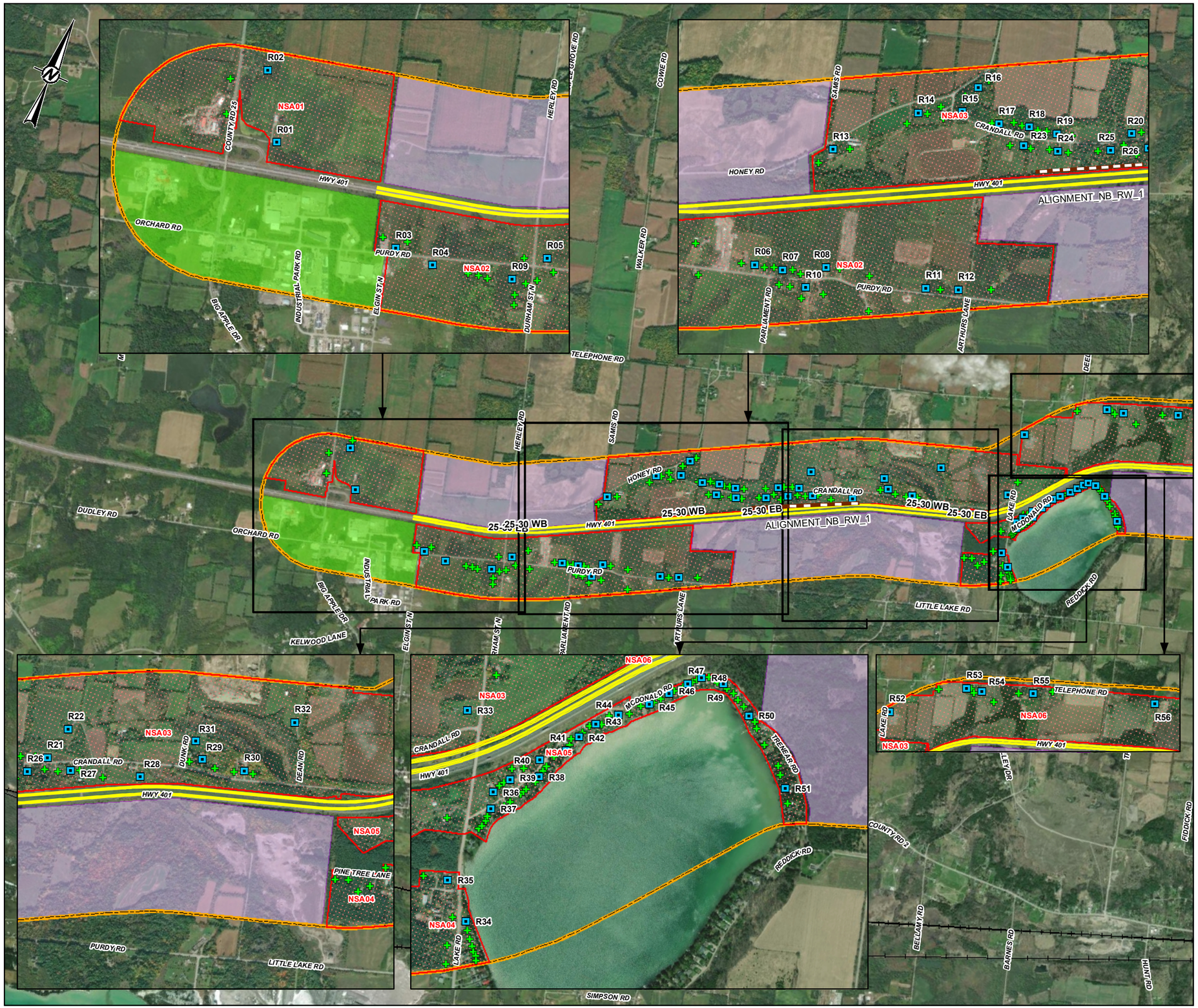
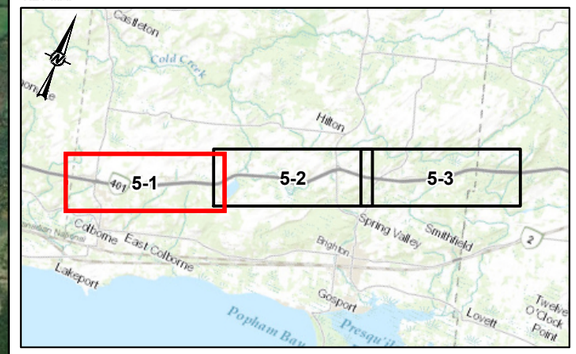



**KEY MAP**




SCALE 1:300,000

**LEGEND**

- NOISE SENSITIVE LANDUSE
- RECEPTORS
- FUTURE ROAD BUILD
- RAILWAY
- NOISE SENSITIVE AREA
- PROJECT BOUNDARY
- INDUSTRIAL
- VACCANT
- BARRIER

0 345 690 1,380

SCALE 1:35,000 METRES

**NOTE(S)**

1. ALL LOCATIONS ARE APPROXIMATE

**REFERENCE(S)**

1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. IMAGERY CREDITS: SOURCES: ESRI, HERE, GARMIN, INTERMAP, INCREMENT P CORP., GEBCO, USGS, FAO, NPS, NRCAN, GEOBASE, IGN, KADASTER NL, ORDNANCE SURVEY, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), (C) OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY
   SOURCE: ESRI, MAXAR, EARTHSTAR GEOGRAPHICS, AND THE GIS USER COMMUNITY
3. COORDINATE SYSTEM: NAD 1983 UTM ZONE 18N

CLIENT

ONTARIO MINISTRY OF TRANSPORTATION (MTO)

PROJECT

HWY 401 COLBORNE TO BRIGHTON - ENVIRONMENTAL IMPACT ASSESSMENT REPORTING, ONTARIO

TITLE

CONSULTANT

wsp

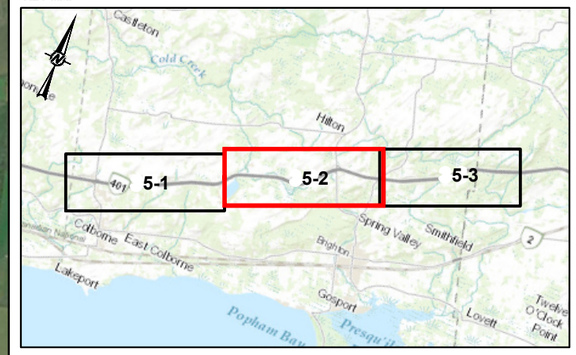
| | |
|---|---|
| YYYY-MM-DD | 2023-11-23 |
| DESIGNED | ---- |
| PREPARED | RSM |
| REVIEWED | ---- |
| APPROVED | ---- |

| PROJECT NO. | CONTROL | REV. | FIGURE |
|---|---|---|---|
| 17M-01712-11 | 0001 | A | 5-1 |

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

PATH: S:\Clients\MTO\Hwy_401_Colborne_to_Brighton\99_PROJ\17M-01712-11_EIA\4)_PROD\0001_Noise\17M-01712-11-0460-HS-0003_1.mxd PRINTED ON: 2023-11-23 AT: 11:04:03 PM


KEY MAP




SCALE 1:300,000

LEGEND

- NOISE SENSITIVE LANDUSE
- RECEPTORS
- PLACES
- FUTURE ROAD BUILD
- RAILWAY
- NOISE SENSITIVE AREA
- PROJECT BOUNDARY
- DISMISSED
- VACCANT
- BARRIER

0 345 690 1,380

SCALE 1:35,000 METRES

**NOTE(S)**

1. ALL LOCATIONS ARE APPROXIMATE

**REFERENCE(S)**

1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. IMAGERY CREDITS: SOURCES: ESRI, HERE, GARMIN, INTERMAP, INCREMENT P CORP., GEBCO, USGS, FAO, NPS, NRCAN, GEOBASE, IGN, KADASTER NL, ORDNANCE SURVEY, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), (C) OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY
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3. COORDINATE SYSTEM: NAD 1983 UTM ZONE 18N

CLIENT

ONTARIO MINISTRY OF TRANSPORTATION (MTO)

PROJECT

HWY 401 COLBORNE TO BRIGHTON - ENVIRONMENTAL IMPACT ASSESSMENT REPORTING, ONTARIO

TITLE

CONSULTANT

wsp

| | |
|---|---|
| YYYY-MM-DD | 2023-11-24 |
| DESIGNED | ---- |
| PREPARED | RSM |
| REVIEWED | ---- |
| APPROVED | ---- |

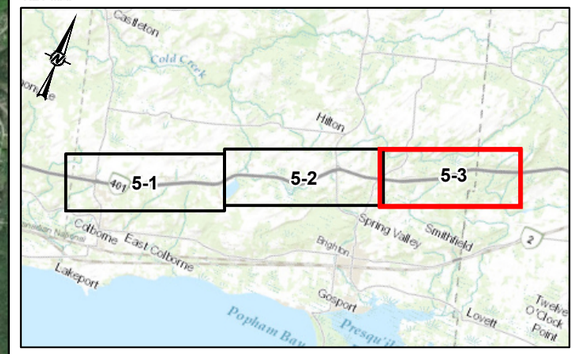
| PROJECT NO. | CONTROL | REV. | FIGURE |
|---|---|---|---|
| 17M-01712-11 | 0001 | A | 5-2 |

PATH: S:\Clients\MTO\Hwy_401_Colborne_to_Brighton\99_PROJ\17M-01712-11_EIA\40_PROD\0001_Noise\17M-01712-11-0460-HS-0003_2.mxd PRINTED ON: 2023-11-24 AT: 12:56:28 AM

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

0 25mm

KEY MAP




SCALE 1:300,000

LEGEND

- NOISE SENSITIVE LANDUSE
- RECEPTORS
- PLACES
- FUTURE ROAD BUILD
- RAILWAY
- NOISE SENSITIVE AREA
- PROJECT BOUNDARY
- DISMISSED
- VACCANT
- BARRIER

0 345 690 1,380

SCALE 1:35,000 METRES

**NOTE(S)**

1. ALL LOCATIONS ARE APPROXIMATE

**REFERENCE(S)**

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ONTARIO MINISTRY OF TRANSPORTATION (MTO)

PROJECT

HWY 401 COLBORNE TO BRIGHTON - ENVIRONMENTAL IMPACT ASSESSMENT REPORTING, ONTARIO

TITLE

CONSULTANT

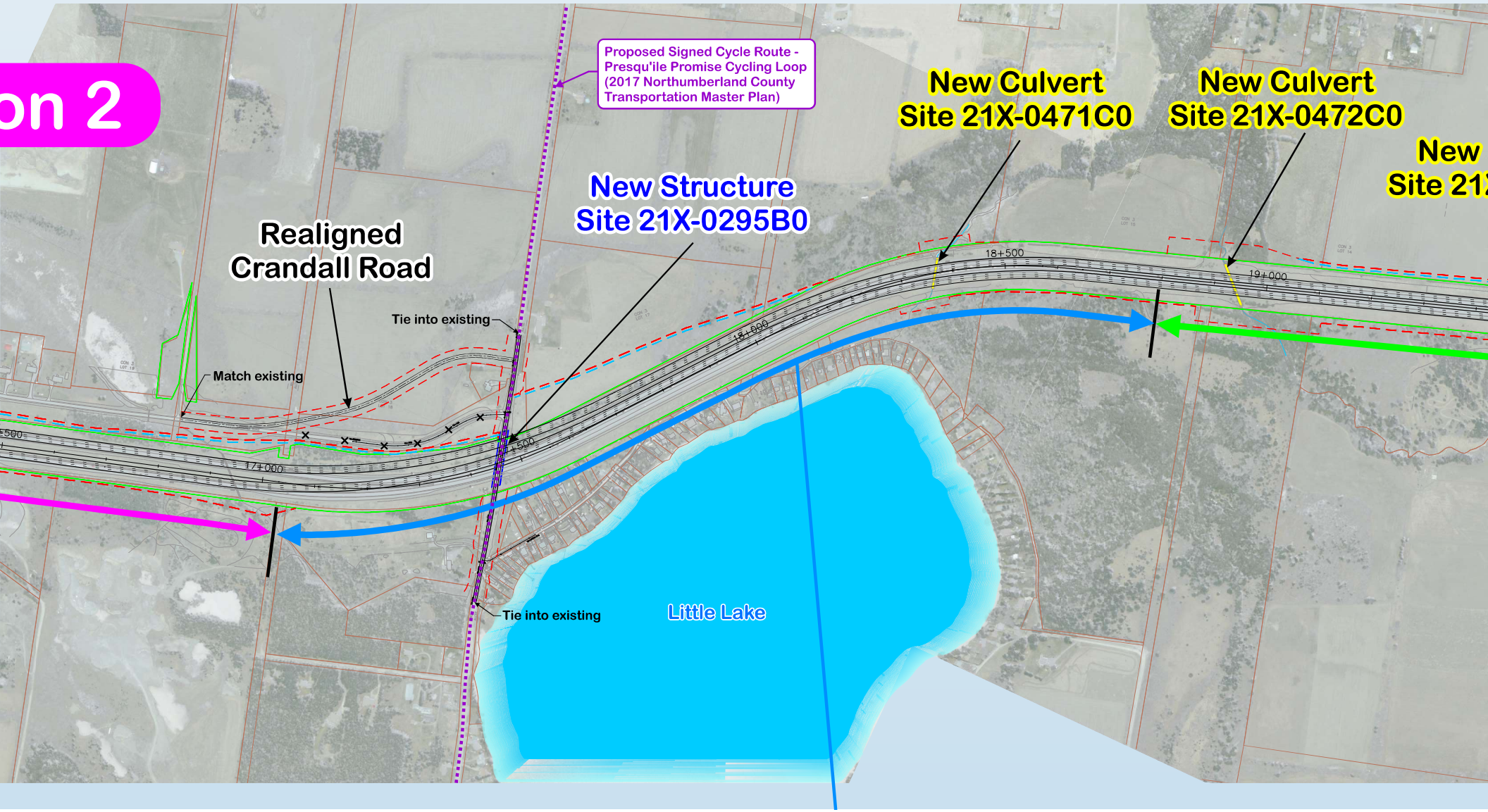
wsp

| | |
|---|---|
| YYYY-MM-DD | 2023-11-24 |
| DESIGNED | ---- |
| PREPARED | RSM |
| REVIEWED | ---- |
| APPROVED | ---- |

| PROJECT NO. | CONTROL | REV. | FIGURE |
|---|---|---|---|
| 17M-01712-11 | 0001 | A | 5-3 |

# APPENDIX

# A MTO BACKGROUND


on 2
Proposed Signed Cycle Route - Presqu'ile Promise Cycling Loop (2017 Northumberland County Transportation Master Plan)
New Culvert Site 21X-0471C0
New Culvert Site 21X-0472C0
New Site 21
New Structure Site 21X-0295B0
Realigned Crandall Road
Tie into existing
Match existing
18+500
19+000
18+000
17+500
17+000
Tie into existing
Little Lake

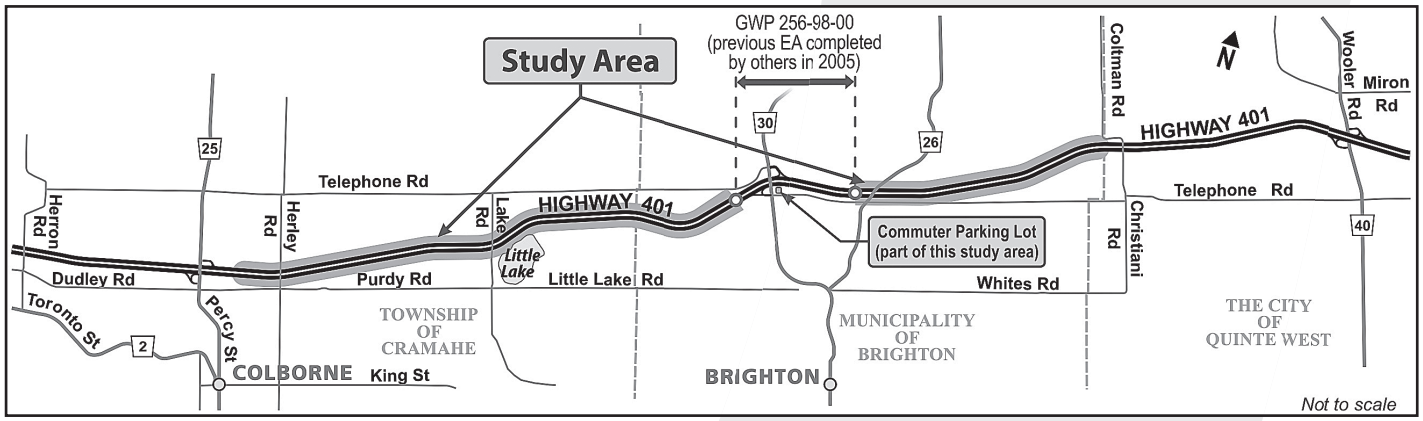
# Notice of Study Commencement

## Preliminary Design Study and Class Environmental Assessment
## Highway 401 Planning Study from Colborne to Brighton (GWP 4054-17-00)

**THE STUDY**

The **Ontario Ministry of Transportation (MTO)** has retained **WSP Canada Group Limited** to undertake a Planning, Preliminary Design and Class Environmental Assessment (Class EA) Study on Highway 401 for the replacement and rehabilitation of structures, establishing the future Highway 401 footprint for an interim six lanes and ultimate eight lanes to address current and future transportation needs, and commuter parking lot improvements from 0.8 km east of Percy Street to 0.4 km west of Christiani Road. The approximate length of the study area is 16 km.

This study will include reviewing existing conditions, developing and evaluating alternatives, identifying appropriate improvements, and developing environmental protection/mitigation measures. A Recommended Plan will be confirmed and designated (protected) at the completion of the study.




**THE PROCESS**

This study is a "Group B" project under the *Class Environmental Assessment (Class EA) for Provincial Transportation Facilities (2000)* and includes undertaking environmental and engineering field investigations and seeking input from the public, local municipalities, external ministries/agencies, and businesses. Two Public Information Centres (PICs) are planned, and notices of the PICs will be advertised in local newspapers, posted on the project website, and sent to the project mailing list.

Upon completion of preliminary design, a Transportation Environmental Study Report (TESR) will be prepared and made available for a 30-day public review period. Notices will be published in local newspapers, posted on the project website, and sent to the project mailing list to advise the public of the TESR public review period.

**CONSULTATION AND COMMENTS**

You are encouraged to participate in the study and to provide comments in writing to the Project Team. If you wish to have your name added to the project mailing list or have any comments, questions or concerns about the study, please contact one of the following Project Team members:

**Mr. Brent Gotts, P.Eng.**
Consultant Project Manager
WSP Canada Group Limited
610 Chartwell Road, Suite 300
Oakville, ON L6J 4A5
tel: 905-823-8500
toll-free: 1-877-562-7947
e-mail: project-team@Highway401colbornebrighton.ca

**Mr. Muhammad Waseem, P.Eng.**
Senior Project Engineer
Ministry of Transportation - Eastern Region
1355 John Counter Boulevard, P.O. Box 4000
Kingston, ON K7L 5A3
tel: 613-449-2615
toll-free: 1-800-267-0295, ext. 4701
e-mail: project-team@Highway401colbornebrighton.ca

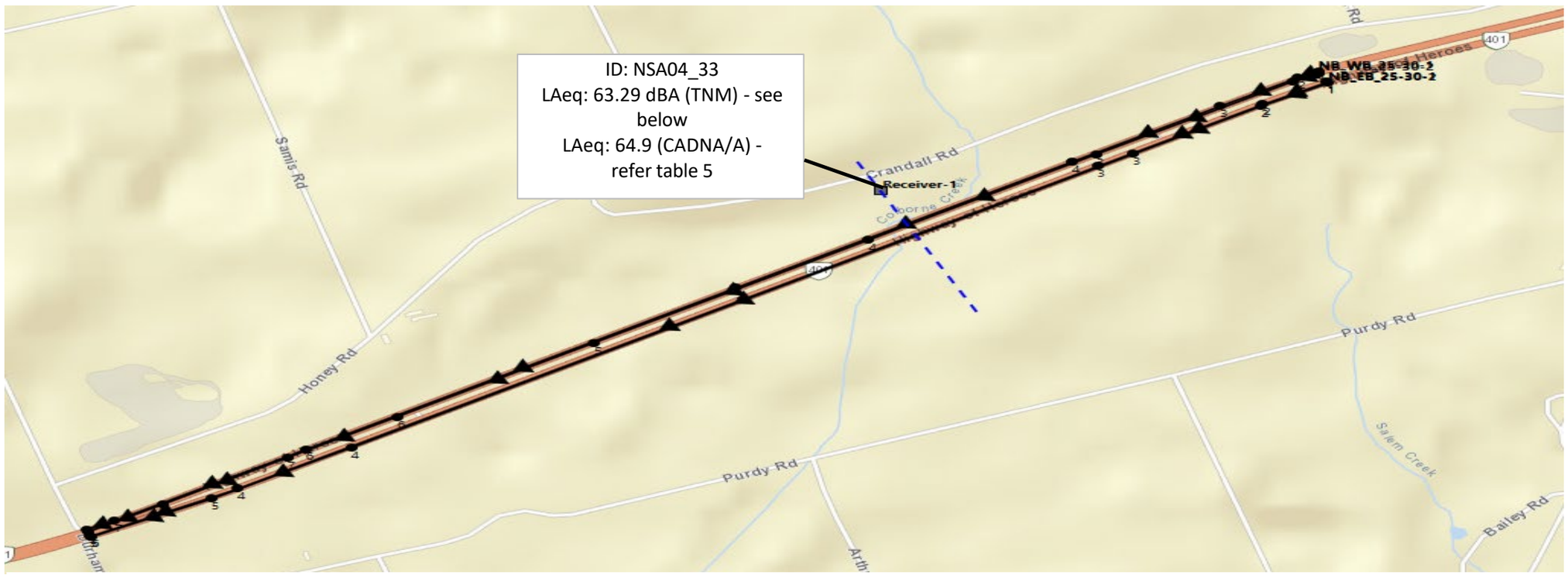
You are encouraged to visit the project website, **www.highway401colbornebrighton.ca,** where project information including study notices, background information, PIC displays, and the TESR will be made available as the study progresses. You can also submit comments and questions to the Project Team on the project website.

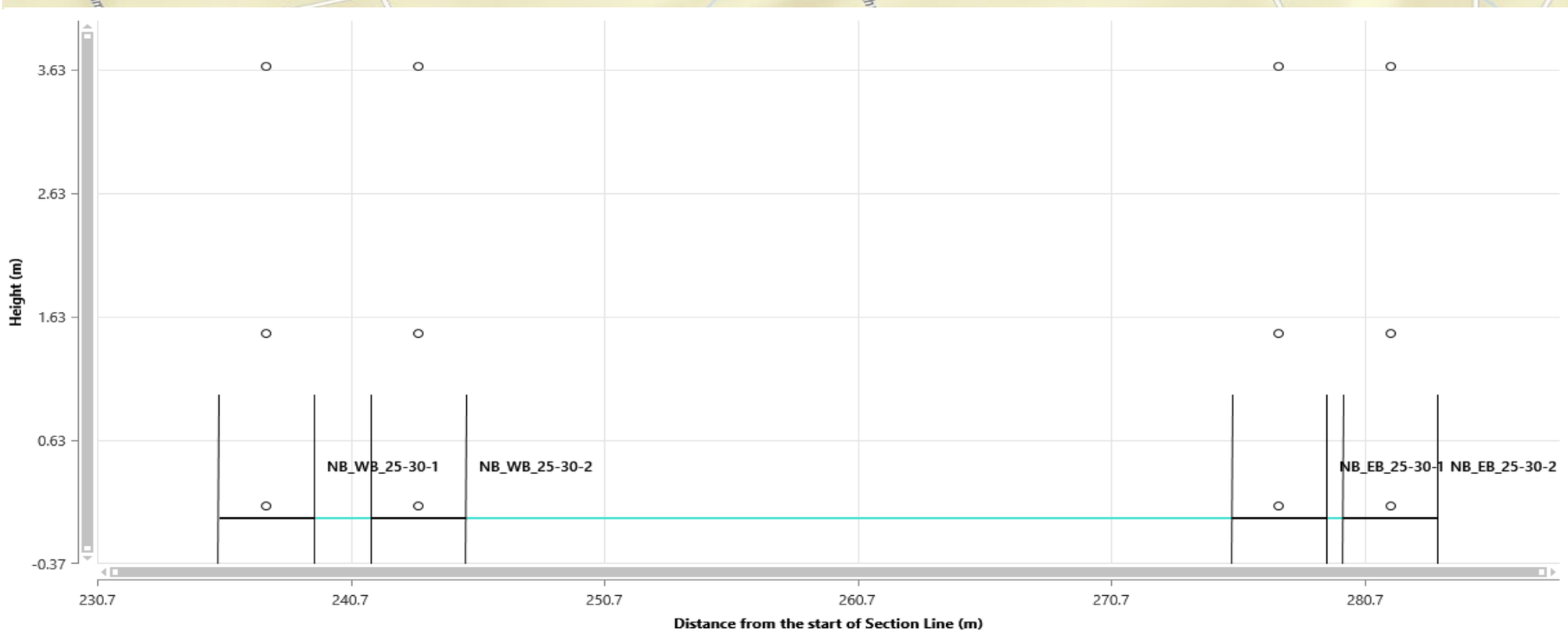
If you have any accessibility requirements in order to participate in this project, please contact one of the Project Team members listed above. Comments and information are being collected to assist the MTO in meeting the requirements of the Ontario *Environmental Assessment Act.* Information will be collected in accordance with the *Freedom of Information and Protection of Privacy Act.* All comments will be maintained on file for use during the study and, with the exception of personal information, may be included in study documentation and become part of the public record.

Ontario

# APPENDIX

# B TNM VERIFICATION FILES


ID: NSA04_33
LAeq: 63.29 dBA (TNM) - see below
LAeq: 64.9 (CADNA/A) - refer table 5
Receiver-1
NB_WB_25-30-2
NB_EB_25-30-2
Crandall Rd
Sanis Rd
Honey Rd
Purdy Rd
Purdy Rd
Salem Creek
Bailey Rd
401


3.63
2.63
1.63
0.63
-0.37
Height (m)
NB_WB_25-30-1
NB_WB_25-30-2
NB_EB_25-30-1
NB_EB_25-30-2
230.7
240.7
250.7
260.7
270.7
280.7
Distance from the start of Section Line (m)

| | | | |
|---|---|---|---|
| REPORT: | **Results: Sound Levels - No Barrier Objects** | | |
| TNM VERSION | 3.1.7970.37608 | REPORT DATE: | 18 September 2023 |
| CALCULATED WITH: | 3.1.7970.37608 | CALCULATION DATE: | 2023-09-06 3:10:28 PM |
| CASE: | Highway 401 Colborne to Brighton | ORGANIZATION: | WSP Canada Inc. |
| UNITS: | Metric | ANALYSIS BY: | Zane Charran |
| DEFAULT GROUND TYPE: | HardSoil | PROJECT/CONTRACT | HIGHWAY 401 PLANNING STUDY FROM COLBORNE TO BRIGHTON (GWP 4054-17-00) PRELIMINARY DESIGN AND ENVIRONMENTAL ASSESSMENT |
| ATMOSPHERICS: | 10°C, 70% | Average pavement type shall be used unless a state highway agency substantiates the use of a different type with approval FHWA. | |
| PAVEMENT TYPE(S) USED: | Average | | |

| Receiver | | | | Modeled Traffic Noise Levels | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | LAeq | | Increase over Existing | | |
| Name | No. | Nb. R.R. | Existing LAeq | Calc. | Absolute Criterion | Calc. | Relative Criterion | Type of Impact |
| | | | dBA | dBA | dBA | dBA | dBA | |
| Receiver-1 | 0 | 0 | --- | 62.8 | 0.0 | --- | --- | Sound Level |

| | | | |
|---|---|---|---|
| REPORT: | **INPUT TRAFFIC FOR TNM VEHICLES (LAeq)** | | |
| TNM VERSION: | 3.1.7970.37608 | REPORT DATE: | 18 September 2023 |
| CALCULATED WITH: | 3.1.7970.37608 | CALCULATION DATE: | 2023-09-06 3:10:28 PM |
| CASE: | Highway 401 Colborne to Brighton | ORGANIZATION: | WSP Canada Inc. |
| ANALYSIS BY: | Zane Charran | PROJECT/CONTRACT: | HIGHWAY 401 PLANNING STUDY FROM COLBORNE TO BRIGHTON (GWP 4054-17-00) PRELIMINARY DESIGN AND ENVIRONMENTAL ASSESSMENT |

| Roadway Name | Road Segment Start Point | | Auto | | Medium Truck | | Heavy Truck | | Bus | | Motorcycle | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Name | No. | Volume [Veh/hr] | Speed [km/h] | Volume [Veh/hr] | Speed [km/h] | Volume [Veh/hr] | Speed [km/h] | Volume [Veh/hr] | Speed [km/h] | Volume [Veh/hr] | Speed [km/h] |
| NB_WB_25-30-1 | Start WB_1 25-30 | 2 | 663 | 100 | 14 | 100 | 84 | 100 | 0 | 0 | 0 | 0 |
| | End WB_1 25-30 | 3 | 663 | 100 | 14 | 100 | 84 | 100 | 0 | 0 | 0 | 0 |
| NB_WB_25-30-2 | End WB_2 25-30 | 0 | 663 | 100 | 14 | 100 | 84 | 100 | 0 | 0 | 0 | 0 |
| | Start WB_2 25-30 | 1 | 663 | 100 | 14 | 100 | 84 | 100 | 0 | 0 | 0 | 0 |
| NB_EB_25-30-1 | End EB_1 25-30 | 4 | 677 | 100 | 18 | 100 | 59 | 100 | 0 | 0 | 0 | 0 |
| | Start EB_1 25-30 | 5 | 677 | 100 | 18 | 100 | 59 | 100 | 0 | 0 | 0 | 0 |
| NB_EB_25-30-2 | End EB_2 25-30 | 6 | 677 | 100 | 18 | 100 | 59 | 100 | 0 | 0 | 0 | 0 |
| | Start EB_2 25-30 | 7 | 677 | 100 | 18 | 100 | 59 | 100 | 0 | 0 | 0 | 0 |

# APPENDIX

# C CADNA/A SAMPLE CALCULATIONS

Configuration

| Configuration | |
|---|---|
| Parameter | Value |
| General | |
| Max. Error (dB) | 0 |
| Max. Search Radius (#(Unit,LEN)) | 2000 |
| Min. Dist Src to Rcvr | 0 |
| Partition | |
| Raster Factor | 0.5 |
| Max. Length of Section (#(Unit,LEN)) | 1000 |
| Min. Length of Section (#(Unit,LEN)) | 1 |
| Min. Length of Section (%) | 0 |
| Proj. Line Sources | On |
| Proj. Area Sources | On |
| Ref. Time | |
| Reference Time Day (min) | 960 |
| Reference Time Night (min) | 480 |
| Daytime Penalty (dB) | 0 |
| Recr. Time Penalty (dB) | 6 |
| Night-time Penalty (dB) | 10 |
| DTM | |
| Standard Height (m) | 0 |
| Model of Terrain | Triangulation |
| Reflection | |
| max. Order of Reflection | 0 |
| Search Radius Src | 100 |
| Search Radius Rcvr | 100 |
| Max. Distance Source - Rcvr | 1000.00 1000.00 |
| Min. Distance Rvcr - Reflector | 1.00 1.00 |
| Min. Distance Source - Reflector | 0.1 |
| Industrial (ISO 9613) | |
| Lateral Diffraction | some Obj |
| Obst. within Area Src do not shield | On |
| Screening | Excl. Ground Att. over Barrier |
| | Dz with limit (20/25) |
| Barrier Coefficients C1,2,3 | 3.0 20.0 0.0 |
| Temperature (#(Unit,TEMP)) | 10 |
| rel. Humidity (%) | 70 |
| Ground Absorption G | 1 |
| Wind Speed for Dir. (#(Unit,SPEED)) | 3 |
| Roads (RLS-90) | |
| Strictly acc. to RLS-90 | |
| Railways (Schall 03 (1990)) | |
| Strictly acc. to Schall 03 / Schall-Transrapid | |
| Aircraft (???) | |
| Strictly acc. to AzB | |

## Receivers

| Name | M. | ID | Level Lr | | Limit. Value | | Land Use | | | Height | | Coordinates | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Day | Night | Day | Night | Type | Auto | Noise Type | | | X | Y | Z |
| | | | (dBA) | (dBA) | (dBA) | (dBA) | | | | (m) | | (m) | (m) | (m) |
| R001 | | NSA01_01 | 34.3 | -80.0 | 65.0 | 0.0 | | | | 1.50 | r | 267284.87 | 4878866.36 | 181.50 |
| R002 | | NSA01_02 | 40.0 | -79.4 | 65.0 | 0.0 | | | | 1.50 | r | 267585.72 | 4878832.61 | 183.05 |
| R003 | | NSA01_03 | 30.5 | -80.1 | 65.0 | 0.0 | | | | 1.50 | r | 267230.96 | 4879046.00 | 186.31 |
| R004 | | NSA01_04 | 30.4 | -80.2 | 65.0 | 0.0 | | | | 1.50 | r | 267387.05 | 4879235.28 | 186.50 |
| R005 | | NSA01_05 | 30.3 | -80.2 | 65.0 | 0.0 | | | | 1.50 | r | 267392.42 | 4879162.14 | 184.47 |
| R006 | | NSA02_01 | 59.5 | -72.3 | 65.0 | 0.0 | | | | 1.50 | r | 268293.99 | 4878591.52 | 171.50 |
| R007 | | NSA02_02 | 58.9 | -72.7 | 65.0 | 0.0 | | | | 1.50 | r | 268378.01 | 4878564.74 | 170.58 |
| R008 | | NSA02_03 | 60.7 | -71.4 | 65.0 | 0.0 | | | | 1.50 | r | 268422.71 | 4878620.35 | 170.42 |
| R009 | | NSA02_04 | 58.5 | -72.9 | 65.0 | 0.0 | | | | 1.50 | r | 268591.57 | 4878556.00 | 168.03 |
| R010 | | NSA02_05 | 61.5 | -70.8 | 65.0 | 0.0 | | | | 1.50 | r | 269019.76 | 4878781.11 | 167.69 |
| R011 | | NSA02_06 | 61.4 | -70.9 | 65.0 | 0.0 | | | | 1.50 | r | 269132.33 | 4878826.16 | 166.50 |
| R012 | | NSA02_07 | 62.7 | -70.0 | 65.0 | 0.0 | | | | 1.50 | r | 269245.41 | 4878935.82 | 166.50 |
| R013 | | NSA02_08 | 59.5 | -72.1 | 65.0 | 0.0 | | | | 1.50 | r | 269505.43 | 4878934.44 | 166.50 |
| R014 | | NSA02_09 | 59.0 | -72.4 | 65.0 | 0.0 | | | | 1.50 | r | 269571.31 | 4878953.61 | 166.50 |
| R015 | | NSA02_10 | 58.3 | -72.9 | 65.0 | 0.0 | | | | 1.50 | r | 269625.14 | 4878960.67 | 166.50 |
| R016 | | NSA02_11 | 57.6 | -73.8 | 65.0 | 0.0 | | | | 1.50 | r | 269669.07 | 4878979.68 | 166.50 |
| R017 | | NSA02_12 | 57.3 | -73.9 | 65.0 | 0.0 | | | | 1.50 | r | 269715.68 | 4878985.98 | 167.98 |
| R018 | | NSA02_13 | 59.2 | -72.3 | 65.0 | 0.0 | | | | 1.50 | r | 269765.78 | 4879006.71 | 170.10 |
| R019 | | NSA02_14 | 58.2 | -72.7 | 65.0 | 0.0 | | | | 1.50 | r | 269811.40 | 4879002.90 | 171.47 |
| R020 | | NSA02_15 | 59.5 | -72.1 | 65.0 | 0.0 | | | | 1.50 | r | 269919.90 | 4879084.83 | 170.43 |
| R021 | | NSA02_16 | 55.7 | -75.7 | 65.0 | 0.0 | | | | 1.50 | r | 269988.79 | 4879105.31 | 169.23 |
| R022 | | NSA02_17 | 58.4 | -72.8 | 65.0 | 0.0 | | | | 1.50 | r | 268781.57 | 4878590.65 | 167.44 |
| R023 | | NSA02_18 | 58.5 | -72.8 | 65.0 | 0.0 | | | | 1.50 | r | 268835.65 | 4878604.25 | 167.07 |
| R024 | | NSA02_19 | 58.3 | -72.9 | 65.0 | 0.0 | | | | 1.50 | r | 268884.63 | 4878605.32 | 166.54 |
| R025 | | NSA02_20 | 58.4 | -72.7 | 65.0 | 0.0 | | | | 1.50 | r | 269004.95 | 4878653.23 | 166.50 |
| R026 | | NSA02_21 | 56.9 | -73.8 | 65.0 | 0.0 | | | | 1.50 | r | 269049.67 | 4878582.96 | 165.06 |
| R027 | | NSA02_22 | 54.4 | -75.2 | 65.0 | 0.0 | | | | 1.50 | r | 269066.81 | 4878531.84 | 163.14 |
| R028 | | NSA02_23 | 58.2 | -73.1 | 65.0 | 0.0 | | | | 1.50 | r | 269081.20 | 4878659.96 | 165.45 |
| R029 | | NSA02_24 | 58.7 | -72.8 | 65.0 | 0.0 | | | | 1.50 | r | 269129.52 | 4878697.95 | 164.46 |
| R030 | | NSA02_25 | 59.1 | -72.8 | 65.0 | 0.0 | | | | 1.50 | r | 269191.28 | 4878771.42 | 163.05 |
| R031 | | NSA02_26 | 58.5 | -73.1 | 65.0 | 0.0 | | | | 1.50 | r | 269322.92 | 4878789.96 | 161.50 |
| R032 | | NSA02_27 | 56.8 | -73.8 | 65.0 | 0.0 | | | | 1.50 | r | 269730.05 | 4878906.65 | 167.10 |
| R033 | | NSA02_28 | 56.5 | -74.4 | 65.0 | 0.0 | | | | 1.50 | r | 269786.08 | 4878919.49 | 169.03 |
| R034 | | NSA02_29 | 55.5 | -74.9 | 65.0 | 0.0 | | | | 1.50 | r | 269865.28 | 4878886.42 | 169.51 |
| R035 | | NSA02_30 | 56.8 | -73.5 | 65.0 | 0.0 | | | | 1.50 | r | 269864.21 | 4878948.17 | 171.50 |
| R036 | | NSA02_31 | 53.9 | -75.9 | 65.0 | 0.0 | | | | 1.50 | r | 269961.11 | 4878950.30 | 167.38 |
| R037 | | NSA02_32 | 54.4 | -75.4 | 65.0 | 0.0 | | | | 1.50 | r | 270213.97 | 4878963.32 | 166.50 |
| R038 | | NSA02_33 | 58.0 | -74.0 | 65.0 | 0.0 | | | | 1.50 | r | 270144.80 | 4879131.70 | 168.99 |
| R039 | | NSA02_34 | 56.5 | -74.6 | 65.0 | 0.0 | | | | 1.50 | r | 270440.39 | 4879188.64 | 166.50 |
| R040 | | NSA02_35 | 56.3 | -74.4 | 65.0 | 0.0 | | | | 1.50 | r | 270511.84 | 4879211.47 | 166.50 |
| R041 | | NSA02_36 | 53.8 | -75.4 | 65.0 | 0.0 | | | | 1.50 | r | 270600.20 | 4879244.87 | 162.23 |
| R042 | | NSA02_37 | 53.9 | -75.3 | 65.0 | 0.0 | | | | 1.50 | r | 270757.64 | 4879313.96 | 162.11 |
| R043 | | NSA03_01 | 63.9 | -69.7 | 65.0 | 0.0 | | | | 1.50 | r | 269670.50 | 4879573.78 | 190.11 |
| R044 | | NSA03_02 | 57.0 | -73.9 | 65.0 | 0.0 | | | | 1.50 | r | 269714.82 | 4879666.03 | 191.50 |
| R045 | | NSA03_03 | 62.0 | -71.1 | 65.0 | 0.0 | | | | 1.50 | r | 269794.44 | 4879700.95 | 189.18 |
| R046 | | NSA03_04 | 58.6 | -73.1 | 65.0 | 0.0 | | | | 1.50 | r | 270015.18 | 4879939.58 | 191.50 |
| R047 | | NSA03_05 | 51.5 | -76.7 | 65.0 | 0.0 | | | | 1.50 | r | 270048.70 | 4880013.33 | 191.50 |
| R048 | | NSA03_06 | 52.7 | -76.1 | 65.0 | 0.0 | | | | 1.50 | r | 270091.61 | 4880029.42 | 191.50 |
| R049 | | NSA03_07 | 52.4 | -76.0 | 65.0 | 0.0 | | | | 1.50 | r | 270145.25 | 4880088.42 | 191.43 |
| R050 | | NSA03_08 | 58.5 | -73.3 | 65.0 | 0.0 | | | | 1.50 | r | 270256.74 | 4880111.45 | 194.21 |
| R051 | | NSA03_09 | 58.7 | -73.0 | 65.0 | 0.0 | | | | 1.50 | r | 270180.12 | 4880038.80 | 189.40 |
| R052 | | NSA03_10 | 51.0 | -76.9 | 65.0 | 0.0 | | | | 1.50 | r | 270238.48 | 4880190.12 | 195.24 |
| R053 | | NSA03_11 | 47.4 | -78.5 | 65.0 | 0.0 | | | | 1.50 | r | 270283.74 | 4880259.87 | 197.18 |
| R054 | | NSA03_12 | 48.5 | -78.2 | 65.0 | 0.0 | | | | 1.50 | r | 270321.01 | 4880312.57 | 197.80 |
| R055 | | NSA03_13 | 59.4 | -72.2 | 65.0 | 0.0 | | | | 1.50 | r | 270422.60 | 4880115.04 | 181.50 |
| R056 | | NSA03_14 | 59.4 | -72.2 | 65.0 | 0.0 | | | | 1.50 | r | 270455.21 | 4880126.76 | 181.58 |
| R057 | | NSA03_15 | 59.4 | -72.1 | 65.0 | 0.0 | | | | 1.50 | r | 270525.44 | 4880161.37 | 182.25 |
| R058 | | NSA03_16 | 59.8 | -71.8 | 65.0 | 0.0 | | | | 1.50 | r | 270571.76 | 4880165.10 | 181.50 |
| R059 | | NSA03_17 | 60.1 | -71.7 | 65.0 | 0.0 | | | | 1.50 | r | 270606.37 | 4880173.09 | 181.50 |
| R060 | | NSA03_18 | 60.6 | -71.3 | 65.0 | 0.0 | | | | 1.50 | r | 270654.89 | 4880174.12 | 180.44 |
| R061 | | NSA03_19 | 60.8 | -71.2 | 65.0 | 0.0 | | | | 1.50 | r | 270700.04 | 4880187.63 | 180.08 |
| R062 | | NSA03_20 | 61.2 | -70.7 | 65.0 | 0.0 | | | | 1.50 | r | 270755.82 | 4880195.24 | 178.78 |
| R063 | | NSA03_21 | 61.7 | -70.4 | 65.0 | 0.0 | | | | 1.50 | r | 270830.93 | 4880217.84 | 178.14 |
| R064 | | NSA03_22 | 62.3 | -70.1 | 65.0 | 0.0 | | | | 1.50 | r | 271008.49 | 4880298.85 | 177.40 |
| R065 | | NSA03_23 | 62.4 | -70.0 | 65.0 | 0.0 | | | | 1.50 | r | 271115.49 | 4880348.48 | 178.94 |
| R066 | | NSA03_24 | 62.1 | -70.2 | 65.0 | 0.0 | | | | 1.50 | r | 271157.28 | 4880375.27 | 180.74 |
| R067 | | NSA03_25 | 62.3 | -70.1 | 65.0 | 0.0 | | | | 1.50 | r | 271227.20 | 4880404.55 | 181.36 |
| R068 | | NSA03_26 | 62.7 | -69.8 | 65.0 | 0.0 | | | | 1.50 | r | 271290.17 | 4880420.81 | 181.71 |
| R069 | | NSA03_27 | 59.7 | -72.6 | 65.0 | 0.0 | | | | 1.50 | r | 271329.94 | 4880601.24 | 211.50 |
| R070 | | NSA03_28 | 62.5 | -70.0 | 65.0 | 0.0 | | | | 1.50 | r | 270553.94 | 4880045.50 | 174.01 |
| R071 | | NSA03_29 | 62.7 | -69.8 | 65.0 | 0.0 | | | | 1.50 | r | 270618.68 | 4880071.38 | 173.46 |
| R072 | | NSA03_30 | 63.3 | -69.4 | 65.0 | 0.0 | | | | 1.50 | r | 270659.58 | 4880072.72 | 173.01 |
| R073 | | NSA03_31 | 63.9 | -68.9 | 65.0 | 0.0 | | | | 1.50 | r | 270752.11 | 4880104.90 | 174.25 |
| R074 | | NSA03_32 | 64.3 | -68.5 | 65.0 | 0.0 | | | | 1.50 | r | 270793.67 | 4880114.29 | 174.44 |
| R075 | | NSA03_33 | 64.9 | -68.1 | 65.0 | 0.0 | | | | 1.50 | r | 270847.86 | 4880130.39 | 174.53 |
| R076 | | NSA03_34 | 65.2 | -68.0 | 65.0 | 0.0 | | | | 1.50 | r | 270986.21 | 4880198.94 | 174.11 |
| R077 | | NSA03_35 | 65.4 | -67.9 | 65.0 | 0.0 | | | | 1.50 | r | 271044.27 | 4880225.27 | 174.92 |
| R078 | | NSA03_36 | 64.6 | -68.6 | 65.0 | 0.0 | | | | 1.50 | r | 271098.88 | 4880279.89 | 176.50 |
| R079 | | NSA03_37 | 67.1 | -66.5 | 65.0 | 0.0 | | | | 1.50 | r | 271177.90 | 4880258.30 | 176.50 |
| R080 | | NSA03_38 | 65.5 | -68.1 | 65.0 | 0.0 | | | | 1.50 | r | 271222.12 | 4880314.72 | 176.50 |
| R081 | | NSA03_39 | 64.9 | -68.2 | 65.0 | 0.0 | | | | 1.50 | r | 271298.75 | 4880360.26 | 178.24 |
| R082 | | NSA03_40 | 65.7 | -67.7 | 65.0 | 0.0 | | | | 1.50 | r | 271367.48 | 4880378.10 | 178.60 |

| Name | M. | ID | Level Lr | | Limit. Value | | Land Use | | | Height | | Coordinates | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Day | Night | Day | Night | Type | Auto | Noise Type | | | X | Y | Z |
| | | | (dBA) | (dBA) | (dBA) | (dBA) | | | | (m) | | (m) | (m) | (m) |
| R083 | | NSA03_41 | 66.0 | -67.7 | 65.0 | 0.0 | | | | 1.50 | r | 271425.63 | 4880407.39 | 179.46 |
| R084 | | NSA03_42 | 66.0 | -67.4 | 65.0 | 0.0 | | | | 1.50 | r | 271471.01 | 4880427.12 | 181.50 |
| R085 | | NSA03_43 | 69.1 | -64.9 | 65.0 | 0.0 | | | | 1.50 | r | 271595.31 | 4880439.20 | 181.50 |
| R086 | | NSA03_44 | 67.9 | -66.1 | 65.0 | 0.0 | | | | 1.50 | r | 271770.74 | 4880520.58 | 181.50 |
| R087 | | NSA03_45 | 64.0 | -69.2 | 65.0 | 0.0 | | | | 1.50 | r | 271976.55 | 4880692.53 | 181.50 |
| R088 | | NSA03_46 | 63.5 | -69.5 | 65.0 | 0.0 | | | | 1.50 | r | 272035.09 | 4880730.45 | 181.50 |
| R089 | | NSA03_47 | 65.5 | -67.9 | 65.0 | 0.0 | | | | 1.50 | r | 272113.12 | 4880712.05 | 181.50 |
| R090 | | NSA03_48 | 66.1 | -67.4 | 65.0 | 0.0 | | | | 1.50 | r | 272213.18 | 4880732.52 | 181.50 |
| R091 | | NSA03_49 | 65.6 | -67.8 | 65.0 | 0.0 | | | | 1.50 | r | 272259.62 | 4880758.49 | 181.50 |
| R092 | | NSA03_50 | 66.2 | -67.3 | 65.0 | 0.0 | | | | 1.50 | r | 272307.64 | 4880761.46 | 181.50 |
| R093 | | NSA03_51 | 60.3 | -71.8 | 65.0 | 0.0 | | | | 1.50 | r | 271964.79 | 4880803.54 | 181.50 |
| R094 | | NSA03_52 | 55.5 | -74.8 | 65.0 | 0.0 | | | | 1.50 | r | 272405.72 | 4881096.25 | 184.51 |
| R095 | | NSA03_53 | 57.1 | -74.4 | 65.0 | 0.0 | | | | 1.50 | r | 273057.05 | 4881110.55 | 196.50 |
| R096 | | NSA03_54 | 57.2 | -74.5 | 65.0 | 0.0 | | | | 1.50 | r | 273096.45 | 4881246.85 | 196.50 |
| R097 | | NSA04_01 | 55.2 | -75.1 | 65.0 | 0.0 | | | | 1.50 | r | 273308.65 | 4880503.09 | 176.98 |
| R098 | | NSA04_02 | 54.9 | -75.3 | 65.0 | 0.0 | | | | 1.50 | r | 273324.62 | 4880478.60 | 177.14 |
| R099 | | NSA04_03 | 54.3 | -75.6 | 65.0 | 0.0 | | | | 1.50 | r | 273342.19 | 4880456.77 | 177.29 |
| R100 | | NSA04_04 | 53.9 | -75.8 | 65.0 | 0.0 | | | | 1.50 | r | 273357.63 | 4880439.73 | 177.28 |
| R101 | | NSA04_05 | 53.7 | -75.9 | 65.0 | 0.0 | | | | 1.50 | r | 273367.75 | 4880424.82 | 177.50 |
| R102 | | NSA04_06 | 53.3 | -76.1 | 65.0 | 0.0 | | | | 1.50 | r | 273378.93 | 4880415.24 | 177.42 |
| R103 | | NSA04_07 | 53.0 | -76.1 | 65.0 | 0.0 | | | | 1.50 | r | 273385.32 | 4880403.53 | 177.68 |
| R104 | | NSA04_08 | 52.3 | -76.4 | 65.0 | 0.0 | | | | 1.50 | r | 273304.39 | 4880356.14 | 181.50 |
| R105 | | NSA04_09 | 53.5 | -75.8 | 65.0 | 0.0 | | | | 1.50 | r | 273284.15 | 4880411.51 | 181.50 |
| R106 | | NSA04_10 | 55.4 | -75.0 | 65.0 | 0.0 | | | | 1.50 | r | 273265.52 | 4880499.90 | 179.71 |
| R107 | | NSA04_11 | 54.8 | -75.1 | 65.0 | 0.0 | | | | 1.50 | r | 273094.85 | 4880462.81 | 181.84 |
| R108 | | NSA04_12 | 53.7 | -75.5 | 65.0 | 0.0 | | | | 1.50 | r | 273052.26 | 4880410.10 | 181.50 |
| R109 | | NSA04_13 | 53.9 | -75.5 | 65.0 | 0.0 | | | | 1.50 | r | 272981.44 | 4880447.90 | 181.50 |
| R110 | | NSA04_14 | 55.5 | -74.7 | 65.0 | 0.0 | | | | 1.50 | r | 272915.42 | 4880422.88 | 181.50 |
| R111 | | NSA04_15 | 58.2 | -73.0 | 65.0 | 0.0 | | | | 1.50 | r | 273132.66 | 4880582.61 | 181.50 |
| R112 | | NSA04_16 | 56.8 | -74.0 | 65.0 | 0.0 | | | | 1.50 | r | 273206.67 | 4880599.12 | 178.68 |
| R113 | | NSA05_01 | 60.0 | -72.8 | 65.0 | 0.0 | | | | 1.50 | r | 273129.55 | 4880776.64 | 176.55 |
| R114 | | NSA05_02 | 58.7 | -72.6 | 65.0 | 0.0 | | | | 1.50 | r | 273233.27 | 4880785.30 | 176.50 |
| R115 | | NSA05_03 | 58.7 | -72.6 | 65.0 | 0.0 | | | | 1.50 | r | 273238.13 | 4880797.12 | 176.50 |
| R116 | | NSA05_04 | 58.6 | -72.8 | 65.0 | 0.0 | | | | 1.50 | r | 273244.68 | 4880815.29 | 176.44 |
| R117 | | NSA05_05 | 58.5 | -72.9 | 65.0 | 0.0 | | | | 1.50 | r | 273243.25 | 4880830.84 | 176.50 |
| R118 | | NSA05_06 | 59.8 | -72.5 | 65.0 | 0.0 | | | | 1.50 | r | 273244.01 | 4880856.91 | 177.85 |
| R119 | | NSA05_07 | 63.3 | -69.7 | 65.0 | 0.0 | | | | 1.50 | r | 273229.62 | 4880907.00 | 181.50 |
| R120 | | NSA05_08 | 63.2 | -69.9 | 65.0 | 0.0 | | | | 1.50 | r | 273240.95 | 4880932.86 | 181.50 |
| R121 | | NSA05_09 | 58.9 | -73.1 | 65.0 | 0.0 | | | | 1.50 | r | 273279.37 | 4880880.59 | 177.57 |
| R122 | | NSA05_10 | 59.3 | -73.0 | 65.0 | 0.0 | | | | 1.50 | r | 273290.97 | 4880899.98 | 177.69 |
| R123 | | NSA05_11 | 63.1 | -70.1 | 65.0 | 0.0 | | | | 1.50 | r | 273249.36 | 4880946.91 | 181.50 |
| R124 | | NSA05_12 | 62.8 | -70.3 | 65.0 | 0.0 | | | | 1.50 | r | 273264.42 | 4880962.09 | 181.50 |
| R125 | | NSA05_13 | 63.6 | -69.6 | 65.0 | 0.0 | | | | 1.50 | r | 273256.64 | 4880995.99 | 181.50 |
| R126 | | NSA05_14 | 58.6 | -73.1 | 65.0 | 0.0 | | | | 1.50 | r | 273312.11 | 4880934.10 | 177.86 |
| R127 | | NSA05_15 | 59.1 | -72.7 | 65.0 | 0.0 | | | | 1.50 | r | 273315.65 | 4880945.31 | 178.29 |
| R128 | | NSA05_16 | 59.3 | -72.6 | 65.0 | 0.0 | | | | 1.50 | r | 273321.45 | 4880955.34 | 178.24 |
| R129 | | NSA05_17 | 63.2 | -70.2 | 65.0 | 0.0 | | | | 1.50 | r | 273289.32 | 4881012.48 | 181.50 |
| R130 | | NSA05_18 | 59.1 | -72.6 | 65.0 | 0.0 | | | | 1.50 | r | 273340.42 | 4880986.50 | 176.86 |
| R131 | | NSA05_19 | 59.9 | -72.1 | 65.0 | 0.0 | | | | 1.50 | r | 273344.29 | 4881007.37 | 177.12 |
| R132 | | NSA05_20 | 61.1 | -71.4 | 65.0 | 0.0 | | | | 1.50 | r | 273347.37 | 4881028.54 | 178.12 |
| R133 | | NSA05_21 | 63.3 | -70.1 | 65.0 | 0.0 | | | | 1.50 | r | 273324.80 | 4881055.57 | 180.84 |
| R134 | | NSA05_22 | 61.5 | -71.1 | 65.0 | 0.0 | | | | 1.50 | r | 273351.25 | 4881045.93 | 178.16 |
| R135 | | NSA05_23 | 62.0 | -70.8 | 65.0 | 0.0 | | | | 1.50 | r | 273361.25 | 4881083.36 | 177.50 |
| R136 | | NSA05_24 | 61.8 | -70.8 | 65.0 | 0.0 | | | | 1.50 | r | 273388.89 | 4881115.04 | 175.23 |
| R137 | | NSA05_25 | 62.1 | -70.6 | 65.0 | 0.0 | | | | 1.50 | r | 273391.23 | 4881136.52 | 174.85 |
| R138 | | NSA05_26 | 62.1 | -70.5 | 65.0 | 0.0 | | | | 1.50 | r | 273389.20 | 4881155.06 | 175.83 |
| R139 | | NSA05_27 | 61.8 | -70.8 | 65.0 | 0.0 | | | | 1.50 | r | 273409.25 | 4881170.59 | 175.29 |
| R140 | | NSA05_28 | 62.3 | -70.4 | 65.0 | 0.0 | | | | 1.50 | r | 273413.35 | 4881186.49 | 175.80 |
| R141 | | NSA05_29 | 62.6 | -70.2 | 65.0 | 0.0 | | | | 1.50 | r | 273426.11 | 4881212.73 | 175.42 |
| R142 | | NSA05_30 | 61.3 | -70.9 | 65.0 | 0.0 | | | | 1.50 | r | 273441.94 | 4881228.12 | 174.87 |
| R143 | | NSA05_31 | 63.0 | -70.3 | 65.0 | 0.0 | | | | 1.50 | r | 273459.30 | 4881233.94 | 174.16 |
| R144 | | NSA05_32 | 61.1 | -71.0 | 65.0 | 0.0 | | | | 1.50 | r | 273469.86 | 4881266.76 | 174.85 |
| R145 | | NSA05_33 | 61.7 | -70.9 | 65.0 | 0.0 | | | | 1.50 | r | 273495.97 | 4881281.12 | 174.47 |
| R146 | | NSA05_34 | 62.2 | -70.7 | 65.0 | 0.0 | | | | 1.50 | r | 273525.67 | 4881297.66 | 174.07 |
| R147 | | NSA05_35 | 63.0 | -70.2 | 65.0 | 0.0 | | | | 1.50 | r | 273548.80 | 4881333.88 | 174.26 |
| R148 | | NSA05_36 | 62.7 | -70.4 | 65.0 | 0.0 | | | | 1.50 | r | 273570.33 | 4881350.03 | 173.90 |
| R149 | | NSA05_37 | 62.5 | -70.5 | 65.0 | 0.0 | | | | 1.50 | r | 273581.98 | 4881359.57 | 173.79 |
| R150 | | NSA05_38 | 62.5 | -70.5 | 65.0 | 0.0 | | | | 1.50 | r | 273597.47 | 4881377.97 | 173.74 |
| R151 | | NSA05_39 | 63.0 | -70.0 | 65.0 | 0.0 | | | | 1.50 | r | 273614.48 | 4881404.22 | 173.86 |
| R152 | | NSA05_40 | 63.1 | -69.8 | 65.0 | 0.0 | | | | 1.50 | r | 273625.82 | 4881418.23 | 173.84 |
| R153 | | NSA05_41 | 63.8 | -69.1 | 65.0 | 0.0 | | | | 1.50 | r | 273648.29 | 4881440.88 | 173.67 |
| R154 | | NSA05_42 | 64.5 | -68.6 | 65.0 | 0.0 | | | | 1.50 | r | 273656.74 | 4881455.34 | 173.72 |
| R155 | | NSA05_43 | 64.7 | -68.5 | 65.0 | 0.0 | | | | 1.50 | r | 273668.15 | 4881463.58 | 173.56 |
| R156 | | NSA05_44 | 64.8 | -68.8 | 65.0 | 0.0 | | | | 1.50 | r | 273676.95 | 4881472.05 | 173.51 |
| R157 | | NSA05_45 | 65.0 | -68.7 | 65.0 | 0.0 | | | | 1.50 | r | 273688.45 | 4881484.36 | 173.46 |
| R158 | | NSA05_46 | 64.8 | -68.8 | 65.0 | 0.0 | | | | 1.50 | r | 273706.90 | 4881485.58 | 173.79 |
| R159 | | NSA05_47 | 63.3 | -70.1 | 65.0 | 0.0 | | | | 1.50 | r | 273739.88 | 4881493.74 | 173.54 |
| R160 | | NSA05_48 | 62.9 | -70.3 | 65.0 | 0.0 | | | | 1.50 | r | 273759.23 | 4881496.93 | 173.73 |
| R161 | | NSA05_49 | 62.7 | -70.4 | 65.0 | 0.0 | | | | 1.50 | r | 273774.99 | 4881488.14 | 173.90 |
| R162 | | NSA05_50 | 62.0 | -70.9 | 65.0 | 0.0 | | | | 1.50 | r | 273800.20 | 4881482.91 | 174.08 |
| R163 | | NSA05_51 | 61.2 | -71.2 | 65.0 | 0.0 | | | | 1.50 | r | 273819.98 | 4881468.77 | 173.85 |
| R164 | | NSA05_52 | 60.4 | -71.8 | 65.0 | 0.0 | | | | 1.50 | r | 273844.91 | 4881456.93 | 173.90 |
| R165 | | NSA05_53 | 58.9 | -73.0 | 65.0 | 0.0 | | | | 1.50 | r | 273871.12 | 4881438.34 | 173.23 |
| R166 | | NSA05_54 | 58.5 | -73.3 | 65.0 | 0.0 | | | | 1.50 | r | 273895.20 | 4881426.08 | 173.25 |

| Name | M. | ID | Level Lr | | Limit. Value | | Land Use | | | Height | | Coordinates | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Day | Night | Day | Night | Type | Auto | Noise Type | | | X | Y | Z |
| | | | (dBA) | (dBA) | (dBA) | (dBA) | | | | (m) | | (m) | (m) | (m) |
| R167 | | NSA05_55 | 57.8 | -73.6 | 65.0 | 0.0 | | | | 1.50 | r | 273909.15 | 4881410.44 | 173.05 |
| R168 | | NSA05_56 | 56.7 | -74.2 | 65.0 | 0.0 | | | | 1.50 | r | 273950.99 | 4881372.41 | 172.84 |
| R169 | | NSA05_57 | 55.9 | -74.6 | 65.0 | 0.0 | | | | 1.50 | r | 274016.08 | 4881329.72 | 173.88 |
| R170 | | NSA05_58 | 56.1 | -74.4 | 65.0 | 0.0 | | | | 1.50 | r | 274032.13 | 4881306.06 | 175.10 |
| R171 | | NSA05_59 | 55.1 | -75.0 | 65.0 | 0.0 | | | | 1.50 | r | 274062.99 | 4881273.51 | 176.03 |
| R172 | | NSA05_60 | 54.1 | -75.6 | 65.0 | 0.0 | | | | 1.50 | r | 274088.34 | 4881232.52 | 176.00 |
| R173 | | NSA06_01 | 53.6 | -76.2 | 65.0 | 0.0 | | | | 1.50 | r | 272982.11 | 4881668.17 | 206.50 |
| R174 | | NSA06_02 | 53.2 | -76.0 | 65.0 | 0.0 | | | | 1.50 | r | 273339.08 | 4882052.75 | 191.14 |
| R175 | | NSA06_03 | 53.5 | -76.2 | 65.0 | 0.0 | | | | 1.50 | r | 273584.02 | 4882167.77 | 178.31 |
| R176 | | NSA06_04 | 53.6 | -75.9 | 65.0 | 0.0 | | | | 1.50 | r | 273626.62 | 4882182.68 | 176.70 |
| R177 | | NSA06_05 | 54.5 | -75.4 | 65.0 | 0.0 | | | | 1.50 | r | 273667.09 | 4882160.31 | 176.68 |
| R178 | | NSA06_06 | 55.0 | -75.0 | 65.0 | 0.0 | | | | 1.50 | r | 273734.18 | 4882200.78 | 176.50 |
| R179 | | NSA06_07 | 57.5 | -73.5 | 65.0 | 0.0 | | | | 1.50 | r | 273879.01 | 4882151.79 | 176.50 |
| R180 | | NSA06_08 | 54.8 | -75.1 | 65.0 | 0.0 | | | | 1.50 | r | 274067.51 | 4882322.19 | 172.40 |
| R181 | | NSA06_09 | 55.1 | -75.8 | 65.0 | 0.0 | | | | 1.50 | r | 274200.32 | 4882378.60 | 174.60 |
| R182 | | NSA06_10 | 52.4 | -76.5 | 65.0 | 0.0 | | | | 1.50 | r | 274365.86 | 4882463.80 | 177.61 |
| R183 | | NSA06_11 | 55.6 | -74.9 | 65.0 | 0.0 | | | | 1.50 | r | 275323.81 | 4882748.05 | 191.50 |
| R184 | | NSA06_12 | 54.5 | -75.7 | 65.0 | 0.0 | | | | 1.50 | r | 275613.82 | 4882874.31 | 194.09 |
| R185 | | NSA07_01 | 64.3 | -69.2 | 65.0 | 0.0 | | | | 1.50 | r | 275114.24 | 4882027.67 | 191.54 |
| R186 | | NSA08_01 | 62.5 | -71.1 | 65.0 | 0.0 | | | | 1.50 | r | 277135.61 | 4883032.97 | 226.50 |
| R187 | | NSA08_02 | 56.7 | -74.8 | 65.0 | 0.0 | | | | 1.50 | r | 277264.80 | 4883389.64 | 226.50 |
| R188 | | NSA08_03 | 57.1 | -74.6 | 65.0 | 0.0 | | | | 1.50 | r | 277292.29 | 4883398.36 | 223.86 |
| R189 | | NSA08_04 | 57.4 | -74.1 | 65.0 | 0.0 | | | | 1.50 | r | 277331.85 | 4883406.40 | 219.27 |
| R190 | | NSA08_05 | 55.0 | -75.3 | 65.0 | 0.0 | | | | 1.50 | r | 277408.96 | 4883528.44 | 213.84 |
| R191 | | NSA08_06 | 57.3 | -74.0 | 65.0 | 0.0 | | | | 1.50 | r | 277568.35 | 4883485.81 | 210.53 |
| R192 | | NSA08_07 | 57.2 | -74.1 | 65.0 | 0.0 | | | | 1.50 | r | 277654.12 | 4883480.98 | 214.06 |
| R193 | | NSA09_01 | 43.8 | -79.7 | 65.0 | 0.0 | | | | 1.50 | r | 278786.49 | 4883934.71 | 212.17 |
| R194 | | NSA09_02 | 37.8 | -80.0 | 65.0 | 0.0 | | | | 1.50 | r | 278869.02 | 4883957.25 | 210.71 |
| R195 | | NSA09_03 | 38.5 | -80.0 | 65.0 | 0.0 | | | | 1.50 | r | 278915.89 | 4883971.39 | 211.50 |
| R196 | | NSA09_04 | 38.9 | -79.8 | 65.0 | 0.0 | | | | 1.50 | r | 278840.91 | 4883875.01 | 207.55 |
| R197 | | NSA09_05 | 38.6 | -79.8 | 65.0 | 0.0 | | | | 1.50 | r | 278938.75 | 4883900.23 | 208.38 |
| R198 | | NSA09_06 | 42.2 | -79.3 | 65.0 | 0.0 | | | | 1.50 | r | 278994.63 | 4883922.85 | 211.50 |
| R199 | | NSA09_07 | 42.7 | -79.3 | 65.0 | 0.0 | | | | 1.50 | r | 279065.38 | 4883936.44 | 209.31 |
| R200 | | NSA09_08 | 43.3 | -79.2 | 65.0 | 0.0 | | | | 1.50 | r | 279130.22 | 4883955.11 | 207.18 |
| R201 | | NSA09_09 | 44.0 | -79.1 | 65.0 | 0.0 | | | | 1.50 | r | 279203.46 | 4883968.95 | 205.67 |
| R202 | | NSA10_01 | 48.5 | -78.2 | 65.0 | 0.0 | | | | 1.50 | r | 279797.78 | 4883894.37 | 196.72 |
| R203 | | NSA10_11 | 50.6 | -77.8 | 65.0 | 0.0 | | | | 1.50 | r | 279841.92 | 4883960.22 | 196.46 |
| R204 | | NSA10_12 | 52.3 | -76.8 | 65.0 | 0.0 | | | | 1.50 | r | 280402.76 | 4884027.49 | 193.41 |
| R205 | | NSA10_13 | 58.7 | -73.9 | 65.0 | 0.0 | | | | 1.50 | r | 280500.30 | 4884200.89 | 203.24 |
| R206 | | NSA10_14 | 61.6 | -70.2 | 65.0 | 0.0 | | | | 1.50 | r | 280566.04 | 4884225.65 | 206.50 |
| R207 | | NSA11_01 | 66.8 | -66.9 | 65.0 | 0.0 | | | | 1.50 | r | 280577.59 | 4884464.11 | 196.50 |
| R208 | | NSA11_02 | 61.2 | -71.3 | 65.0 | 0.0 | | | | 1.50 | r | 280547.03 | 4884577.46 | 201.50 |
| R209 | | NSA11_03 | 62.8 | -70.1 | 65.0 | 0.0 | | | | 1.50 | r | 280613.04 | 4884550.34 | 199.92 |
| R210 | | NSA11_04 | 60.5 | -72.0 | 65.0 | 0.0 | | | | 1.50 | r | 280657.89 | 4884617.30 | 201.34 |
| R211 | | NSA11_05 | 60.8 | -71.6 | 65.0 | 0.0 | | | | 1.50 | r | 280707.51 | 4884612.94 | 201.50 |
| R212 | | NSA11_06 | 59.2 | -72.8 | 65.0 | 0.0 | | | | 1.50 | r | 280767.82 | 4884694.64 | 202.57 |
| R213 | | NSA11_07 | 56.1 | -74.6 | 65.0 | 0.0 | | | | 1.50 | r | 280603.41 | 4884790.16 | 211.50 |
| R214 | | NSA11_08 | 57.1 | -74.4 | 65.0 | 0.0 | | | | 1.50 | r | 280674.42 | 4884815.51 | 216.81 |
| R215 | | NSA11_09 | 54.6 | -75.9 | 65.0 | 0.0 | | | | 1.50 | r | 280685.41 | 4884981.62 | 233.08 |
| R216 | | NSA11_10 | 53.6 | -76.3 | 65.0 | 0.0 | | | | 1.50 | r | 280733.53 | 4885016.63 | 236.50 |
| R217 | | NSA11_11 | 43.5 | -78.9 | 65.0 | 0.0 | | | | 1.50 | r | 280986.45 | 4885091.27 | 226.50 |
| R218 | | NSA11_12 | 49.0 | -77.0 | 65.0 | 0.0 | | | | 1.50 | r | 281097.18 | 4885118.32 | 231.50 |
| R219 | | NSA11_13 | 49.4 | -77.2 | 65.0 | 0.0 | | | | 1.50 | r | 281167.34 | 4885131.00 | 231.00 |
| R220 | | NSA11_14 | 54.2 | -75.5 | 65.0 | 0.0 | | | | 1.50 | r | 281174.95 | 4885010.97 | 227.47 |
| R221 | | NSA11_15 | 57.2 | -73.9 | 65.0 | 0.0 | | | | 1.50 | r | 281012.65 | 4884872.34 | 224.57 |
| R222 | | NSA11_16 | 54.4 | -75.5 | 65.0 | 0.0 | | | | 1.50 | r | 280897.85 | 4884904.58 | 223.20 |
| R223 | | NSA12_01 | 64.9 | -67.1 | 65.0 | 0.0 | | | | 1.50 | r | 281231.75 | 4884447.60 | 183.65 |
| R224 | | NSA12_02 | 64.2 | -67.8 | 65.0 | 0.0 | | | | 1.50 | r | 281282.90 | 4884451.26 | 181.03 |
| R225 | | NSA12_03 | 64.5 | -67.6 | 65.0 | 0.0 | | | | 1.50 | r | 281324.73 | 4884469.64 | 180.56 |
| R226 | | NSA12_04 | 64.2 | -68.0 | 65.0 | 0.0 | | | | 1.50 | r | 281396.07 | 4884487.04 | 179.88 |
| R227 | | NSA12_05 | 64.9 | -67.5 | 65.0 | 0.0 | | | | 1.50 | r | 281449.77 | 4884506.22 | 179.79 |
| R228 | | NSA12_06 | 66.1 | -67.0 | 65.0 | 0.0 | | | | 1.50 | r | 281502.37 | 4884524.72 | 179.46 |
| R229 | | NSA12_07 | 66.8 | -66.6 | 65.0 | 0.0 | | | | 1.50 | r | 281552.29 | 4884546.74 | 179.02 |
| R230 | | NSA12_08 | 66.5 | -66.9 | 65.0 | 0.0 | | | | 1.50 | r | 281586.20 | 4884555.18 | 178.06 |
| R231 | | NSA12_09 | 65.3 | -67.8 | 65.0 | 0.0 | | | | 1.50 | r | 281667.41 | 4884566.38 | 176.50 |
| R232 | | NSA12_10 | 65.3 | -67.7 | 65.0 | 0.0 | | | | 1.50 | r | 281720.24 | 4884583.26 | 176.50 |
| R233 | | NSA12_11 | 65.5 | -67.6 | 65.0 | 0.0 | | | | 1.50 | r | 281759.80 | 4884605.56 | 176.50 |
| R234 | | NSA12_12 | 64.5 | -68.3 | 65.0 | 0.0 | | | | 1.50 | r | 281810.12 | 4884606.49 | 176.50 |
| R235 | | NSA12_13 | 64.0 | -68.8 | 65.0 | 0.0 | | | | 1.50 | r | 281916.37 | 4884644.59 | 176.50 |
| R236 | | NSA12_14 | 63.8 | -68.9 | 65.0 | 0.0 | | | | 1.50 | r | 281952.54 | 4884658.09 | 176.50 |
| R237 | | NSA12_15 | 62.9 | -69.6 | 65.0 | 0.0 | | | | 1.50 | r | 282061.01 | 4884683.96 | 176.14 |
| R238 | | NSA12_16 | 61.5 | -70.8 | 65.0 | 0.0 | | | | 1.50 | r | 282135.30 | 4884721.57 | 173.32 |
| R239 | | NSA12_17 | 59.9 | -71.5 | 65.0 | 0.0 | | | | 1.50 | r | 282175.14 | 4884731.36 | 171.50 |
| R240 | | NSA12_18 | 58.7 | -72.2 | 65.0 | 0.0 | | | | 1.50 | r | 282270.85 | 4884769.73 | 168.86 |
| R241 | | NSA12_19 | 56.2 | -73.8 | 65.0 | 0.0 | | | | 1.50 | r | 282354.23 | 4884791.67 | 165.19 |
| R242 | | NSA12_20 | 70.9 | -63.3 | 65.0 | 0.0 | | | | 1.50 | r | 281723.26 | 4884669.09 | 177.04 |
| R243 | | NSA12_21 | 69.9 | -64.1 | 65.0 | 0.0 | | | | 1.50 | r | 281760.48 | 4884678.48 | 176.50 |
| R244 | | NSA12_22 | 69.1 | -64.8 | 65.0 | 0.0 | | | | 1.50 | r | 281820.91 | 4884697.72 | 176.50 |
| R245 | | NSA12_23 | 68.4 | -65.3 | 65.0 | 0.0 | | | | 1.50 | r | 281854.55 | 4884704.16 | 176.50 |
| R246 | | NSA12_24 | 68.4 | -65.4 | 65.0 | 0.0 | | | | 1.50 | r | 281892.11 | 4884721.19 | 177.12 |
| R247 | | NSA12_25 | 67.3 | -66.3 | 65.0 | 0.0 | | | | 1.50 | r | 281958.71 | 4884737.03 | 177.33 |
| R248 | | NSA12_26 | 66.4 | -67.0 | 65.0 | 0.0 | | | | 1.50 | r | 282023.58 | 4884753.93 | 176.96 |
| R249 | | NSA12_27 | 65.7 | -67.6 | 65.0 | 0.0 | | | | 1.50 | r | 282098.51 | 4884778.35 | 176.54 |
| R250 | | NSA12_28 | 65.7 | -67.6 | 65.0 | 0.0 | | | | 1.50 | r | 282124.50 | 4884789.77 | 176.50 |

| Name | M. | ID | Level Lr | | Limit. Value | | Land Use | | | Height | | Coordinates | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Day | Night | Day | Night | Type | Auto | Noise Type | | | X | Y | Z |
| | | | (dBA) | (dBA) | (dBA) | (dBA) | | | | (m) | | (m) | (m) | (m) |
| R251 | | NSA12_29 | 65.4 | -68.0 | 65.0 | 0.0 | | | | 1.50 | r | 282211.77 | 4884822.01 | 175.61 |
| R252 | | NSA12_30 | 65.1 | -68.1 | 65.0 | 0.0 | | | | 1.50 | r | 282233.37 | 4884830.16 | 175.84 |
| R253 | | NSA12_31 | 64.6 | -68.5 | 65.0 | 0.0 | | | | 1.50 | r | 282287.39 | 4884843.33 | 175.51 |
| R254 | | NSA12_32 | 65.6 | -67.8 | 65.0 | 0.0 | | | | 1.50 | r | 282333.30 | 4884895.06 | 175.14 |
| R255 | | NSA12_33 | 61.1 | -70.6 | 65.0 | 0.0 | | | | 1.50 | r | 282403.44 | 4884882.18 | 171.58 |
| R256 | | NSA12_34 | 63.5 | -69.2 | 65.0 | 0.0 | | | | 1.50 | r | 281593.69 | 4884492.02 | 176.98 |
| R257 | | NSA12_35 | 62.7 | -69.7 | 65.0 | 0.0 | | | | 1.50 | r | 281700.63 | 4884508.79 | 176.50 |
| R258 | | NSA12_36 | 62.1 | -70.3 | 65.0 | 0.0 | | | | 1.50 | r | 281576.68 | 4884429.50 | 176.50 |
| R259 | | NSA12_37 | 61.0 | -70.9 | 65.0 | 0.0 | | | | 1.50 | r | 281726.15 | 4884456.90 | 176.50 |
| R260 | | NSA12_38 | 60.5 | -71.3 | 65.0 | 0.0 | | | | 1.50 | r | 281620.91 | 4884396.32 | 176.50 |
| R261 | | NSA12_39 | 56.8 | -74.1 | 65.0 | 0.0 | | | | 1.50 | r | 281752.31 | 4884363.50 | 173.50 |
| R262 | | NSA12_40 | 51.1 | -76.3 | 65.0 | 0.0 | | | | 1.50 | r | 281737.20 | 4884280.87 | 163.32 |
| R263 | | NSA12_41 | 61.1 | -71.2 | 65.0 | 0.0 | | | | 1.50 | r | 282607.24 | 4884920.22 | 176.50 |
| R264 | | NSA12_42 | 60.6 | -71.5 | 65.0 | 0.0 | | | | 1.50 | r | 282641.46 | 4884929.94 | 176.50 |
| R265 | | NSA12_43 | 61.3 | -71.1 | 65.0 | 0.0 | | | | 1.50 | r | 282739.04 | 4884966.27 | 176.97 |
| R266 | | NSA12_44 | 61.0 | -71.3 | 65.0 | 0.0 | | | | 1.50 | r | 282841.27 | 4885006.20 | 176.50 |
| R267 | | NSA12_45 | 60.7 | -71.4 | 65.0 | 0.0 | | | | 1.50 | r | 282885.52 | 4885014.91 | 176.50 |
| R268 | | NSA12_46 | 61.1 | -71.1 | 65.0 | 0.0 | | | | 1.50 | r | 282991.04 | 4885083.99 | 176.16 |
| R269 | | NSA12_47 | 57.3 | -73.4 | 65.0 | 0.0 | | | | 1.50 | r | 283023.22 | 4885090.03 | 173.01 |
| R270 | | NSA12_48 | 58.5 | -72.5 | 65.0 | 0.0 | | | | 1.50 | r | 283068.94 | 4885143.48 | 173.84 |
| R271 | | NSA12_49 | 59.5 | -72.3 | 65.0 | 0.0 | | | | 1.50 | r | 283330.67 | 4885198.15 | 171.50 |
| R272 | | NSA12_50 | 59.2 | -72.3 | 65.0 | 0.0 | | | | 1.50 | r | 282686.55 | 4884861.18 | 176.50 |
| R273 | | NSA12_51 | 59.2 | -72.3 | 65.0 | 0.0 | | | | 1.50 | r | 282766.39 | 4884885.66 | 176.50 |
| R274 | | NSA12_52 | 59.4 | -72.2 | 65.0 | 0.0 | | | | 1.50 | r | 282802.58 | 4884912.27 | 176.50 |
| R275 | | NSA12_53 | 58.7 | -73.0 | 65.0 | 0.0 | | | | 1.50 | r | 282851.54 | 4884935.69 | 174.47 |
| R276 | | NSA12_54 | 55.4 | -74.6 | 65.0 | 0.0 | | | | 1.50 | r | 282887.74 | 4884946.34 | 172.59 |
| R277 | | NSA12_55 | 54.9 | -74.9 | 65.0 | 0.0 | | | | 1.50 | r | 282938.83 | 4884955.92 | 169.57 |
| R278 | | NSA12_56 | 52.8 | -75.5 | 65.0 | 0.0 | | | | 1.50 | r | 283199.32 | 4884843.21 | 161.50 |
| R279 | | NSA12_57 | 53.8 | -75.3 | 65.0 | 0.0 | | | | 1.50 | r | 283277.07 | 4884948.66 | 166.50 |
| R280 | | NSA12_58 | 53.5 | -75.3 | 65.0 | 0.0 | | | | 1.50 | r | 283156.71 | 4884990.20 | 161.86 |
| R281 | | NSA12_59 | 55.9 | -74.3 | 65.0 | 0.0 | | | | 1.50 | r | 283248.31 | 4885023.21 | 168.28 |
| R282 | | NSA12_60 | 56.3 | -74.3 | 65.0 | 0.0 | | | | 1.50 | r | 283327.22 | 4885014.80 | 171.50 |
| R283 | | NSA12_61 | 56.7 | -74.0 | 65.0 | 0.0 | | | | 1.50 | r | 283363.16 | 4885063.00 | 171.50 |
| R284 | | NSA12_62 | 55.3 | -74.7 | 65.0 | 0.0 | | | | 1.50 | r | 283501.84 | 4885054.96 | 171.50 |
| R285 | | NSA12_63 | 55.1 | -74.8 | 65.0 | 0.0 | | | | 1.50 | r | 283610.49 | 4885124.92 | 171.50 |
| R286 | | NSA12_64 | 55.0 | -74.9 | 65.0 | 0.0 | | | | 1.50 | r | 283657.94 | 4885150.86 | 171.50 |
| R287 | | NSA12_65 | 54.2 | -75.4 | 65.0 | 0.0 | | | | 1.50 | r | 283708.99 | 4885161.68 | 171.50 |
| R288 | | NSA12_66 | 53.4 | -75.9 | 65.0 | 0.0 | | | | 1.50 | r | 283763.11 | 4885160.84 | 171.50 |
| R289 | | NSA12_67 | 53.4 | -76.0 | 65.0 | 0.0 | | | | 1.50 | r | 283823.15 | 4885186.21 | 171.50 |
| R290 | | NSA13_01 | 51.8 | -77.0 | 65.0 | 0.0 | | | | 1.50 | r | 285208.46 | 4886439.59 | 176.50 |
| R291 | | NSA13_02 | 50.5 | -77.5 | 65.0 | 0.0 | | | | 1.50 | r | 285287.64 | 4886419.46 | 176.50 |
| R292 | | NSA13_03 | 51.4 | -77.3 | 65.0 | 0.0 | | | | 1.50 | r | 285242.14 | 4886367.95 | 176.50 |
| R293 | | NSA13_04 | 51.0 | -77.5 | 65.0 | 0.0 | | | | 1.50 | r | 285262.01 | 4886325.26 | 172.92 |
| R294 | | NSA13_05 | 51.1 | -77.5 | 65.0 | 0.0 | | | | 1.50 | r | 285258.49 | 4886296.36 | 171.50 |
| R295 | | NSA13_06 | 50.6 | -77.6 | 65.0 | 0.0 | | | | 1.50 | r | 285273.93 | 4886255.43 | 169.02 |
| R296 | | NSA14_01 | 63.3 | -70.1 | 65.0 | 0.0 | | | | 1.50 | r | 284791.80 | 4886759.08 | 188.51 |
| R297 | | NSA14_02 | 60.1 | -72.6 | 65.0 | 0.0 | | | | 1.50 | r | 284851.37 | 4886786.33 | 188.43 |
| R298 | | NSA14_03 | 57.7 | -74.5 | 65.0 | 0.0 | | | | 1.50 | r | 284926.64 | 4886828.07 | 189.02 |
| R299 | | NSA14_04 | 56.2 | -75.3 | 65.0 | 0.0 | | | | 1.50 | r | 284966.53 | 4886859.91 | 189.67 |
| R300 | | NSA14_05 | 54.9 | -76.1 | 65.0 | 0.0 | | | | 1.50 | r | 285023.14 | 4886872.59 | 188.63 |
| R301 | | NSA14_06 | 53.8 | -76.5 | 65.0 | 0.0 | | | | 1.50 | r | 285061.16 | 4886852.73 | 186.50 |
| R302 | | NSA14_07 | 52.2 | -77.4 | 65.0 | 0.0 | | | | 1.50 | r | 285172.38 | 4886917.24 | 186.50 |
| R303 | | NSA14_08 | 39.1 | -79.9 | 65.0 | 0.0 | | | | 1.50 | r | 285131.15 | 4887128.78 | 208.11 |
| R304 | | NSA14_09 | 47.1 | -78.3 | 65.0 | 0.0 | | | | 1.50 | r | 284984.89 | 4887026.49 | 216.50 |
| NSA01_Receptor_01 | | R01: NSA01_01, NSA01_02, NSA01_03 | 40.0 | -79.4 | 65.0 | 0.0 | | | | 1.50 | r | 267585.74 | 4878832.67 | 183.05 |
| NSA01_Receptor_02 | | R02: NSA01_04, NSA01_05 | 30.5 | -80.1 | 65.0 | 0.0 | | | | 1.50 | r | 267392.42 | 4879163.48 | 184.53 |
| NSA02_Receptor_03 | | R03: NSA02_01, NSA02_02, NSA02_03 | 58.9 | -72.7 | 65.0 | 0.0 | | | | 1.50 | r | 268378.23 | 4878564.85 | 170.58 |
| NSA02_Receptor_04 | | R04: NSA02_04 | 58.6 | -72.9 | 65.0 | 0.0 | | | | 1.50 | r | 268590.97 | 4878556.88 | 168.05 |
| NSA02_Receptor_05 | | R05: NSA02_05, NSA02_06, NSA02_07 | 61.4 | -70.9 | 65.0 | 0.0 | | | | 1.50 | r | 269132.05 | 4878826.10 | 166.50 |
| NSA02_Receptor_06 | | R06: NSA02_08, NSA02_09, NSA02_10 | 59.0 | -72.4 | 65.0 | 0.0 | | | | 1.50 | r | 269572.72 | 4878953.83 | 166.50 |
| NSA02_Receptor_07 | | R07: NSA02_11, NSA02_12, NSA02_13 | 57.3 | -73.9 | 65.0 | 0.0 | | | | 1.50 | r | 269716.66 | 4878987.00 | 168.03 |
| NSA02_Receptor_08 | | R08: NSA02_14, NSA02_15, NSA02_16 | 59.5 | -72.1 | 65.0 | 0.0 | | | | 1.50 | r | 269919.17 | 4879084.61 | 170.44 |
| NSA02_Receptor_09 | | R09: NSA02_17 - NSA02_26 | 56.2 | -74.2 | 65.0 | 0.0 | | | | 1.50 | r | 269004.35 | 4878652.60 | 159.14 |
| NSA02_Receptor_10 | | R10: NSA02_27 - NSA02_32 | 56.8 | -73.5 | 65.0 | 0.0 | | | | 1.50 | r | 269863.15 | 4878948.17 | 171.48 |
| NSA02_Receptor_11 | | R11: NSA02_33, NSA02_34, NSA02_35 | 56.5 | -74.5 | 65.0 | 0.0 | | | | 1.50 | r | 270439.45 | 4879189.63 | 166.50 |
| NSA02_Receptor_12 | | R12: NSA02_36, NSA02_37 | 54.0 | -75.4 | 65.0 | 0.0 | | | | 1.50 | r | 270599.70 | 4879248.16 | 162.41 |
| NSA03_Receptor_13 | | R13: NSA03_01, NSA03_02, NSA03_03 | 56.8 | -74.0 | 65.0 | 0.0 | | | | 1.50 | r | 269713.86 | 4879666.06 | 191.50 |
| NSA03_Receptor_14 | | R14: NSA03_04, NSA03_05, NSA03_06 | 51.4 | -76.7 | 65.0 | 0.0 | | | | 1.50 | r | 270047.64 | 4880014.62 | 191.50 |
| NSA03_Receptor_15 | | R15: NSA03_07, NSA03_08, NSA03_09 | 58.5 | -73.3 | 65.0 | 0.0 | | | | 1.50 | r | 270255.58 | 4880111.21 | 194.26 |
| NSA03_Receptor_16 | | R16: NSA03_10, NSA03_11, NSA03_12 | 47.2 | -78.5 | 65.0 | 0.0 | | | | 1.50 | r | 270282.41 | 4880258.78 | 197.12 |
| NSA03_Receptor_17 | | R17: NSA03_13, NSA03_14, NSA03_15 | 59.5 | -72.2 | 65.0 | 0.0 | | | | 1.50 | r | 270455.83 | 4880126.11 | 181.41 |
| NSA03_Receptor_18 | | R18: NSA03_16, NSA03_17, NSA03_18 | 60.1 | -71.7 | 65.0 | 0.0 | | | | 1.50 | r | 270606.80 | 4880173.09 | 181.50 |
| NSA03_Receptor_19 | | R19: NSA03_19, NSA03_20, NSA03_21 | 61.2 | -70.7 | 65.0 | 0.0 | | | | 1.50 | r | 270755.41 | 4880195.44 | 178.81 |
| NSA03_Receptor_20 | | R20: NSA03_22, NSA03_23, NSA03_24 | 62.4 | -70.0 | 65.0 | 0.0 | | | | 1.50 | r | 271113.82 | 4880349.41 | 178.98 |
| NSA03_Receptor_21 | | R21: NSA03_25, NSA03_26 | 62.7 | -69.8 | 65.0 | 0.0 | | | | 1.50 | r | 271287.85 | 4880420.73 | 181.73 |
| NSA03_Receptor_22 | | R22: NSA03_27 | 59.7 | -72.6 | 65.0 | 0.0 | | | | 1.50 | r | 271330.78 | 4880600.50 | 211.50 |
| NSA03_Receptor_23 | | R23: NSA03_28, NSA03_29, NSA03_30 | 62.7 | -69.8 | 65.0 | 0.0 | | | | 1.50 | r | 270619.75 | 4880071.92 | 173.47 |
| NSA03_Receptor_24 | | R24: NSA03_31, NSA03_32, NSA03_33 | 64.3 | -68.5 | 65.0 | 0.0 | | | | 1.50 | r | 270794.16 | 4880114.86 | 174.46 |
| NSA03_Receptor_25 | | R25: NSA03_34, NSA03_35, NSA03_36 | 65.4 | -67.9 | 65.0 | 0.0 | | | | 1.50 | r | 271044.82 | 4880226.15 | 174.96 |
| NSA03_Receptor_26 | | R26: NSA03_37, NSA03_38, NSA03_39 | 65.5 | -68.1 | 65.0 | 0.0 | | | | 1.50 | r | 271221.73 | 4880314.41 | 176.50 |
| NSA03_Receptor_27 | | R27: NSA03_40, NSA03_41, NSA03_42 | 66.0 | -67.7 | 65.0 | 0.0 | | | | 1.50 | r | 271426.25 | 4880407.38 | 179.46 |
| NSA03_Receptor_28 | | R28: NSA03_43, NSA03_44 | 67.8 | -66.1 | 65.0 | 0.0 | | | | 1.50 | r | 271771.42 | 4880520.80 | 181.50 |
| NSA03_Receptor_29 | | R29: NSA03_45, NSA03_46, NSA03_47 | 63.5 | -69.5 | 65.0 | 0.0 | | | | 1.50 | r | 272035.40 | 4880729.39 | 181.50 |
| NSA03_Receptor_30 | | R30: NSA03_48, NSA03_49, NSA03_50 | 65.5 | -67.9 | 65.0 | 0.0 | | | | 1.50 | r | 272259.44 | 4880759.57 | 181.50 |

| Name | M. | ID | Level Lr | | Limit. Value | | Land Use | | | Height | | Coordinates | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Day | Night | Day | Night | Type | Auto | Noise Type | | | X | Y | Z |
| | | | (dBA) | (dBA) | (dBA) | (dBA) | | | | (m) | | (m) | (m) | (m) |
| NSA03_Receptor_31 | | R31: NSA03_51 | 60.3 | -71.8 | 65.0 | 0.0 | | | | 1.50 | r | 271964.79 | 4880803.32 | 181.50 |
| NSA03_Receptor_32 | | R32: NSA03_52 | 55.5 | -74.8 | 65.0 | 0.0 | | | | 1.50 | r | 272403.12 | 4881095.33 | 184.37 |
| NSA03_Receptor_33 | | R33: NSA03_53, NSA09_54 | 57.5 | -74.3 | 65.0 | 0.0 | | | | 1.50 | r | 273057.15 | 4881110.42 | 196.50 |
| NSA04_Receptor_34 | | R34: NSA04_01 - NSA04_10 | 55.1 | -75.2 | 65.0 | 0.0 | | | | 1.50 | r | 273308.96 | 4880502.82 | 176.97 |
| NSA04_Receptor_35 | | R35: NSA04_11 - NSA04_16 | 56.9 | -74.0 | 65.0 | 0.0 | | | | 1.50 | r | 273206.57 | 4880599.54 | 178.69 |
| NSA05_Receptor_36 | | R36: NSA05_01, NSA05_07, NSA05_08 | 63.2 | -69.7 | 65.0 | 0.0 | | | | 1.50 | r | 273230.08 | 4880906.87 | 181.50 |
| NSA05_Receptor_37 | | R37: NSA05_02 - NSA05_06 | 59.9 | -72.4 | 65.0 | 0.0 | | | | 1.50 | r | 273244.29 | 4880856.83 | 177.83 |
| NSA05_Receptor_38 | | R38: NSA05_09, 10, 16,18 20, 21, 22 | 59.9 | -72.1 | 65.0 | 0.0 | | | | 1.50 | r | 273343.57 | 4881007.10 | 177.16 |
| NSA05_Receptor_39 | | R39: NSA05_11, NSA05_12, NSA05_13 | 62.8 | -70.3 | 65.0 | 0.0 | | | | 1.50 | r | 273264.62 | 4880962.22 | 181.50 |
| NSA05_Receptor_40 | | R40: NSA05_17, NSA05_21 | 63.3 | -70.1 | 65.0 | 0.0 | | | | 1.50 | r | 273324.77 | 4881055.56 | 180.85 |
| NSA05_Receptor_41 | | R41: NSA05_23, NSA05_24, NSA05_25 | 61.7 | -70.9 | 65.0 | 0.0 | | | | 1.50 | r | 273388.52 | 4881114.72 | 175.30 |
| NSA05_Receptor_42 | | R42: NSA05_26, NSA05_27, NSA05_28 | 61.8 | -70.7 | 65.0 | 0.0 | | | | 1.50 | r | 273408.98 | 4881170.40 | 175.28 |
| NSA05_Receptor_43 | | R43: NSA05_29, NSA05_30, NSA05_31 | 61.3 | -70.9 | 65.0 | 0.0 | | | | 1.50 | r | 273442.02 | 4881227.75 | 174.86 |
| NSA05_Receptor_44 | | R44: NSA05_32, NSA05_33, NSA05_34 | 61.9 | -70.8 | 65.0 | 0.0 | | | | 1.50 | r | 273496.22 | 4881281.29 | 174.47 |
| NSA05_Receptor_45 | | R45: NSA05_35, NSA05_36, NSA05_37 | 62.7 | -70.4 | 65.0 | 0.0 | | | | 1.50 | r | 273570.54 | 4881350.16 | 173.90 |
| NSA05_Receptor_46 | | R46: NSA05_38, NSA05_39, NSA05_40 | 62.9 | -70.0 | 65.0 | 0.0 | | | | 1.50 | r | 273614.59 | 4881404.38 | 173.86 |
| NSA05_Receptor_47 | | R47: NSA05_41, NSA05_42, NSA05_43 | 64.5 | -68.6 | 65.0 | 0.0 | | | | 1.50 | r | 273656.98 | 4881455.53 | 173.72 |
| NSA05_Receptor_48 | | R48: NSA05_44, NSA05_45, NSA05_46 | 65.0 | -68.7 | 65.0 | 0.0 | | | | 1.50 | r | 273688.52 | 4881484.11 | 173.44 |
| NSA05_Receptor_49 | | R49: NSA05_47, NSA05_48, NSA05_49 | 62.9 | -70.3 | 65.0 | 0.0 | | | | 1.50 | r | 273758.89 | 4881497.19 | 173.75 |
| NSA05_Receptor_50 | | R50: NSA05_50 - NSA05_57 | 58.9 | -73.0 | 65.0 | 0.0 | | | | 1.50 | r | 273870.03 | 4881437.83 | 173.20 |
| NSA05_Receptor_51 | | R51: NSA05_58 - NSA05_60 | 55.1 | -75.0 | 65.0 | 0.0 | | | | 1.50 | r | 274063.27 | 4881273.30 | 176.04 |
| NSA06_Receptor_52 | | R52: NSA06_01 | 53.4 | -76.1 | 65.0 | 0.0 | | | | 1.50 | r | 272981.68 | 4881667.38 | 171.50 |
| NSA06_Receptor_53 | | R53: NSA06_02, NSA06_03, NSA06_04 | 53.1 | -76.3 | 65.0 | 0.0 | | | | 1.50 | r | 273583.23 | 4882169.76 | 178.26 |
| NSA06_Receptor_54 | | R54: NSA06_05, NSA06_06, NSA06_07 | 55.1 | -74.9 | 65.0 | 0.0 | | | | 1.50 | r | 273733.68 | 4882198.50 | 176.50 |
| NSA06_Receptor_55 | | R55: NSA06_08, NSA06_09, NSA06_10 | 55.4 | -75.6 | 65.0 | 0.0 | | | | 1.50 | r | 274200.26 | 4882376.00 | 174.71 |
| NSA06_Receptor_56 | | R56: NSA06_11, NSA06_12 | 55.6 | -74.9 | 65.0 | 0.0 | | | | 1.50 | r | 275323.59 | 4882747.77 | 191.50 |
| NSA07_Receptor_57 | | R57: NSA07_01 | 64.2 | -69.2 | 65.0 | 0.0 | | | | 1.50 | r | 275114.65 | 4882028.31 | 191.54 |
| NSA08_Receptor_58 | | R58: NSA08_01 | 62.1 | -71.2 | 65.0 | 0.0 | | | | 1.50 | r | 277134.17 | 4883034.54 | 226.50 |
| NSA08_Receptor_59 | | R59: NSA08_02, NSA08_03, NSA08_04 | 57.2 | -74.5 | 65.0 | 0.0 | | | | 1.50 | r | 277293.55 | 4883394.41 | 223.60 |
| NSA08_Receptor_60 | | R60: NSA08_05, NSA08_06, NSA08_07 | 57.2 | -74.0 | 65.0 | 0.0 | | | | 1.50 | r | 277567.27 | 4883488.33 | 210.63 |
| NSA09_Receptor_61 | | R61: NSA09_01, NSA09_02, NSA09_03 | 37.5 | -80.0 | 65.0 | 0.0 | | | | 1.50 | r | 278868.41 | 4883956.97 | 210.71 |
| NSA09_Receptor_62 | | R62: NSA09_04, NSA09_05, NSA09_06 | 38.9 | -79.7 | 65.0 | 0.0 | | | | 1.50 | r | 278939.23 | 4883899.46 | 208.35 |
| NSA09_Receptor_63 | | R63: NSA09_07, NSA09_08, NSA09_09 | 43.2 | -79.2 | 65.0 | 0.0 | | | | 1.50 | r | 279129.33 | 4883955.37 | 207.27 |
| NSA09_Receptor_64 | | R64: NSA09_10, NSA09_11 | 50.6 | -77.8 | 65.0 | 0.0 | | | | 1.50 | r | 279841.02 | 4883959.27 | 196.50 |
| NSA09_Receptor_67 | | R67: NSA09_12, NSA09_13, NSA09_14 | 58.7 | -73.9 | 65.0 | 0.0 | | | | 1.50 | r | 280500.57 | 4884201.09 | 203.27 |
| NSA11_Receptor_68 | | R68: NSA11_01, NSA11_02, NSA11_03 | 66.8 | -66.9 | 65.0 | 0.0 | | | | 1.50 | r | 280577.69 | 4884464.34 | 196.50 |
| NSA11_Receptor_69 | | R69: NSA11_04, NSA11_05, NSA11_06 | 60.8 | -71.5 | 65.0 | 0.0 | | | | 1.50 | r | 280707.18 | 4884612.62 | 201.50 |
| NSA11_Receptor_70 | | R70: NSA11_07 - NSA11_11 | 53.9 | -76.1 | 65.0 | 0.0 | | | | 1.50 | r | 280731.45 | 4885015.32 | 236.50 |
| NSA11_Receptor_71 | | R71: NSA11_12 - NSA11_16 | 57.2 | -73.9 | 65.0 | 0.0 | | | | 1.50 | r | 281012.30 | 4884872.04 | 224.55 |
| NSA12_Receptor_72 | | R72: NSA12_01, NSA12_02, NSA12_03 | 64.1 | -67.8 | 65.0 | 0.0 | | | | 1.50 | r | 281281.57 | 4884451.07 | 181.04 |
| NSA12_Receptor_73 | | R73: NSA12_04, NSA12_05, NSA12_06 | 64.9 | -67.5 | 65.0 | 0.0 | | | | 1.50 | r | 281450.41 | 4884505.72 | 179.77 |
| NSA12_Receptor_74 | | R74: NSA12_07, NSA12_08, NSA12_09 | 66.4 | -67.0 | 65.0 | 0.0 | | | | 1.50 | r | 281586.61 | 4884554.03 | 178.04 |
| NSA12_Receptor_75 | | R75: NSA12_10 - NSA12_19 | 63.9 | -68.8 | 65.0 | 0.0 | | | | 1.50 | r | 281963.91 | 4884665.83 | 176.50 |
| NSA12_Receptor_76 | | R76: NSA12_20, NSA12_21, NSA12_22 | 70.1 | -63.9 | 65.0 | 0.0 | | | | 1.50 | r | 281759.24 | 4884679.69 | 176.50 |
| NSA12_Receptor_77 | | R77: NSA12_23, NSA12_24, NSA12_25 | 68.3 | -65.5 | 65.0 | 0.0 | | | | 1.50 | r | 281892.09 | 4884720.62 | 177.09 |
| NSA12_Receptor_78 | | R78: NSA12_26, NSA12_27, NSA12_28 | 65.7 | -67.6 | 65.0 | 0.0 | | | | 1.50 | r | 282098.35 | 4884777.64 | 176.52 |
| NSA12_Receptor_79 | | R79: NSA12_29, NSA12_30, NSA12_31 | 65.1 | -68.1 | 65.0 | 0.0 | | | | 1.50 | r | 282233.71 | 4884830.68 | 175.88 |
| NSA12_Receptor_80 | | R80: NSA12_32, NSA12_33 | 65.7 | -67.7 | 65.0 | 0.0 | | | | 1.50 | r | 282333.62 | 4884897.40 | 175.24 |
| NSA12_Receptor_81 | | R81: NSA12_34 - NSA12_40 | 63.5 | -69.2 | 65.0 | 0.0 | | | | 1.50 | r | 281593.27 | 4884492.76 | 177.00 |
| NSA12_Receptor_82 | | R82: NSA12_41, NSA12_42, NSA12_43 | 61.3 | -71.1 | 65.0 | 0.0 | | | | 1.50 | r | 282740.18 | 4884967.50 | 177.00 |
| NSA12_Receptor_83 | | R83: NSA12_44, NSA12_45, NSA12_46 | 60.6 | -71.4 | 65.0 | 0.0 | | | | 1.50 | r | 282887.79 | 4885014.47 | 176.50 |
| NSA12_Receptor_84 | | R84: NSA12_47, NSA12_48, NSA12_49 | 58.5 | -72.5 | 65.0 | 0.0 | | | | 1.50 | r | 283067.61 | 4885143.30 | 173.88 |
| NSA12_Receptor_85 | | R85: NSA12_50 - NSA12_55 | 59.4 | -72.2 | 65.0 | 0.0 | | | | 1.50 | r | 282803.25 | 4884911.14 | 176.40 |
| NSA12_Receptor_86 | | R86: NSA12_56 - NSA12_62 | 53.6 | -75.2 | 65.0 | 0.0 | | | | 1.50 | r | 283156.69 | 4884990.43 | 161.86 |
| NSA12_Receptor_87 | | R87: NSA12_63, NSA12_64, NSA12_65 | 55.0 | -74.9 | 65.0 | 0.0 | | | | 1.50 | r | 283658.39 | 4885150.69 | 171.50 |
| NSA12_Receptor_88 | | R88: NSA12_66, NSA12_67 | 53.4 | -76.1 | 65.0 | 0.0 | | | | 1.50 | r | 283820.54 | 4885187.26 | 171.50 |
| NSA13_Receptor_89 | | R89: NSA13_01 - NSA13_06 | 51.8 | -77.0 | 65.0 | 0.0 | | | | 1.50 | r | 285208.84 | 4886439.95 | 176.50 |
| NSA14_Receptor_90 | | R90: NSA14_01, NSA14_02, NSA14_03 | 60.2 | -72.5 | 65.0 | 0.0 | | | | 1.50 | r | 284850.96 | 4886785.80 | 188.41 |
| NSA14_Receptor_91 | | R91: NSA14_04, NSA14_05, NSA14_06 | 54.8 | -76.1 | 65.0 | 0.0 | | | | 1.50 | r | 285022.45 | 4886872.61 | 188.65 |
| NSA14_Receptor_92 | | R92: NSA14_07, NSA14_08, NSA14_09 | 52.4 | -77.4 | 65.0 | 0.0 | | | | 1.50 | r | 285173.00 | 4886917.22 | 186.50 |

# APPENDIX

# D RECEPTOR RESULTS

| Location | Receptor | Noise Sensitive Land Use | Build (dBA) | No Build (dBA) |
|---|---|---|---|---|
| NSA01_Receptor_01 | NSA01_01 | OLA | 34.3 | 34.5 |
| | NSA01_02 | OLA | 40 | 40.2 |
| | NSA01_03 | OLA | 30.5 | 30.7 |
| NSA01_Receptor_02 | NSA01_04 | OLA | 30.4 | 29.8 |
| | NSA01_05 | OLA | 30.3 | 30.6 |
| NSA02_Receptor_03 | NSA02_01 | OLA | 59.5 | 59.5 |
| | NSA02_02 | OLA | 58.9 | 58.9 |
| | NSA02_03 | OLA | 60.7 | 60.7 |
| NSA02_Receptor_04 | NSA02_04 | OLA | 58.5 | 58.6 |
| NSA02_Receptor_05 | NSA02_05 | OLA | 61.5 | 61.5 |
| | NSA02_06 | OLA | 61.4 | 61.3 |
| | NSA02_07 | OLA | 62.7 | 62.6 |
| NSA02_Receptor_06 | NSA02_08 | OLA | 59.5 | 59.5 |
| | NSA02_09 | OLA | 59 | 59.1 |
| | NSA02_10 | OLA | 58.3 | 58.4 |
| NSA02_Receptor_07 | NSA02_11 | OLA | 57.6 | 57.7 |
| | NSA02_12 | OLA | 57.3 | 57.2 |
| | NSA02_13 | OLA | 59.2 | 59.1 |
| NSA02_Receptor_08 | NSA02_14 | OLA | 58.2 | 58.2 |
| | NSA02_15 | OLA | 59.5 | 59.5 |
| | NSA02_16 | OLA | 55.7 | 55.6 |
| NSA02_Receptor_09 | NSA02_17 | OLA | 58.4 | 58.5 |
| | NSA02_18 | OLA | 58.5 | 58.5 |
| | NSA02_19 | OLA | 58.3 | 58.3 |
| | NSA02_20 | OLA | 58.4 | 58.4 |
| | NSA02_21 | OLA | 56.9 | 56.9 |
| | NSA02_22 | OLA | 54.4 | 54.6 |
| | NSA02_23 | OLA | 58.2 | 58.2 |
| | NSA02_24 | OLA | 58.7 | 58.8 |
| | NSA02_25 | OLA | 59.1 | 59 |
| | NSA02_26 | OLA | 58.5 | 58.5 |
| NSA02_Receptor_10 | NSA02_27 | OLA | 56.8 | 56.8 |
| | NSA02_28 | OLA | 56.5 | 56.5 |
| | NSA02_29 | OLA | 55.5 | 55.5 |
| | NSA02_30 | OLA | 56.8 | 56.8 |
| | NSA02_31 | OLA | 53.9 | 53.9 |
| | NSA02_32 | OLA | 54.4 | 54.3 |
| NSA02_Receptor_11 | NSA02_33 | OLA | 58 | 58 |
| | NSA02_34 | OLA | 56.5 | 56.6 |
| | NSA02_35 | OLA | 56.3 | 56.3 |
| NSA02_Receptor_12 | NSA02_36 | OLA | 53.8 | 53.9 |
| | NSA02_37 | OLA | 53.9 | 53.8 |

| | | | | |
|---|---|---|---|---|
| NSA03_Receptor_13 | NSA03_01 | OLA | 63.9 | 63.9 |
| | NSA03_02 | OLA | 57 | 57 |
| | NSA03_03 | OLA | 62 | 62 |
| NSA03_Receptor_14 | NSA03_04 | OLA | 58.6 | 58.6 |
| | NSA03_05 | OLA | 51.5 | 51.5 |
| | NSA03_06 | OLA | 52.7 | 52.6 |
| NSA03_Receptor_15 | NSA03_07 | OLA | 52.4 | 52.2 |
| | NSA03_08 | OLA | 58.5 | 58.5 |
| | NSA03_09 | OLA | 58.7 | 58.7 |
| NSA03_Receptor_16 | NSA03_10 | OLA | 51 | 51 |
| | NSA03_11 | OLA | 47.4 | 47.1 |
| | NSA03_12 | OLA | 48.5 | 48.4 |
| NSA03_Receptor_17 | NSA03_13 | OLA | 59.4 | 59.4 |
| | NSA03_14 | OLA | 59.4 | 59.4 |
| | NSA03_15 | OLA | 59.4 | 59.4 |
| NSA03_Receptor_18 | NSA03_16 | OLA | 59.8 | 59.9 |
| | NSA03_17 | OLA | 60.1 | 60.2 |
| | NSA03_18 | OLA | 60.6 | 60.5 |
| NSA03_Receptor_19 | NSA03_19 | OLA | 60.8 | 60.8 |
| | NSA03_20 | OLA | 61.2 | 61.2 |
| | NSA03_21 | OLA | 61.7 | 61.7 |
| NSA03_Receptor_20 | NSA03_22 | OLA | 62.3 | 62.2 |
| | NSA03_23 | OLA | 62.4 | 62.4 |
| | NSA03_24 | OLA | 62.1 | 62 |
| NSA03_Receptor_21 | NSA03_25 | OLA | 62.3 | 62.2 |
| | NSA03_26 | OLA | 62.7 | 62.7 |
| NSA03_Receptor_22 | NSA03_27 | OLA | 59.7 | 59.6 |
| NSA03_Receptor_23 | NSA03_28 | OLA | 62.5 | 62.4 |
| | NSA03_29 | OLA | 62.7 | 62.7 |
| | NSA03_30 | OLA | 63.3 | 63.4 |
| NSA03_Receptor_24 | NSA03_31 | OLA | 63.9 | 63.9 |
| | NSA03_32 | OLA | 64.3 | 64.4 |
| | NSA03_33 | OLA | 64.9 | 64.9 |
| NSA03_Receptor_25 | NSA03_34 | OLA | 65.2 | 65.2 |
| | NSA03_35 | OLA | 65.4 | 65.4 |
| | NSA03_36 | OLA | 64.6 | 64.6 |
| NSA03_Receptor_26 | NSA03_37 | OLA | 67.1 | 67.1 |
| | NSA03_38 | OLA | 65.5 | 65.4 |
| | NSA03_39 | OLA | 64.9 | 65 |
| NSA03_Receptor_27 | NSA03_40 | OLA | 65.7 | 65.6 |
| | NSA03_41 | OLA | 66 | 65.8 |
| | NSA03_42 | OLA | 66 | 65.9 |
| NSA03_Receptor_28 | NSA03_43 | OLA | 69.1 | 69.1 |
| | NSA03_44 | OLA | 67.9 | 67.6 |
| NSA03_Receptor_29 | NSA03_45 | OLA | 64 | 63.8 |
| | NSA03_46 | OLA | 63.5 | 63.3 |
| | NSA03_47 | OLA | 65.5 | 65.3 |

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|---|---|---|---|---|
| NSA03_Receptor_30 | NSA03_48 | OLA | 66.1 | 65.9 |
| | NSA03_49 | OLA | 65.6 | 65.4 |
| | NSA03_50 | OLA | 66.2 | 66 |
| NSA03_Receptor_31 | NSA03_51 | OLA | 60.3 | 60.2 |
| NSA03_Receptor_32 | NSA03_52 | OLA | 55.5 | 55.4 |
| NSA03_Receptor_33 | NSA03_53 | OLA | 57.1 | 60.6 |
| | NSA03_54 | OLA | 57.2 | 56.4 |
| NSA04_Receptor_34 | NSA04_01 | OLA | 55.2 | 55.2 |
| | NSA04_02 | OLA | 54.9 | 55 |
| | NSA04_03 | OLA | 54.3 | 54.5 |
| | NSA04_04 | OLA | 53.9 | 54.1 |
| | NSA04_05 | OLA | 53.7 | 53.6 |
| | NSA04_06 | OLA | 53.3 | 53.4 |
| | NSA04_07 | OLA | 53 | 53.1 |
| | NSA04_08 | OLA | 52.3 | 52.6 |
| | NSA04_09 | OLA | 53.5 | 53.7 |
| | NSA04_10 | OLA | 55.4 | 55.8 |
| NSA04_Receptor_35 | NSA04_11 | OLA | 54.8 | 55.3 |
| | NSA04_12 | OLA | 53.7 | 54.5 |
| | NSA04_13 | OLA | 53.9 | 54.2 |
| | NSA04_14 | OLA | 55.5 | 55.6 |
| | NSA04_15 | OLA | 58.2 | 58.7 |
| | NSA04_16 | OLA | 56.8 | 57.5 |
| NSA05_Receptor_36 | NSA05_01 | OLA | 60 | 60.9 |
| | NSA05_07 | OLA | 58.7 | 60.1 |
| | NSA05_08 | OLA | 58.7 | 60.1 |
| NSA05_Receptor_37 | NSA05_02 | OLA | 58.6 | 60.2 |
| | NSA05_03 | OLA | 58.5 | 60.2 |
| | NSA05_04 | OLA | 59.8 | 61.4 |
| | NSA05_05 | OLA | 63.3 | 64.9 |
| | NSA05_06 | OLA | 63.2 | 64.9 |
| NSA05_Receptor_38 | NSA05_09 | OLA | 58.9 | 60.3 |
| | NSA05_10 | OLA | 59.3 | 60.3 |
| | NSA05_14 | OLA | 63.1 | 64.7 |
| | NSA05_15 | OLA | 62.8 | 64.5 |
| | NSA05_16 | OLA | 63.6 | 65.5 |
| | NSA05_18 | OLA | 58.6 | 59.2 |
| | NSA05_19 | OLA | 59.1 | 60.4 |
| | NSA05_20 | OLA | 59.3 | 60.6 |
| | NSA05_22 | OLA | 63.2 | 65 |
| NSA05_Receptor_39 | NSA05_11 | OLA | 59.1 | 60.7 |
| | NSA05_12 | OLA | 59.9 | 61.2 |
| | NSA05_13 | OLA | 61.1 | 62.7 |
| NSA05_Receptor_40 | NSA05_17 | OLA | 63.3 | 65.2 |
| | NSA05_21 | OLA | 61.5 | 63.1 |
| NSA05_Receptor_41 | NSA05_23 | OLA | 62 | 63.6 |
| | NSA05_24 | OLA | 61.8 | 63 |

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|---|---|---|---|---|
| | NSA05_25 | OLA | 62.1 | 63.7 |
| NSA05_Receptor_42 | NSA05_26 | OLA | 62.1 | 63.2 |
| | NSA05_27 | OLA | 61.8 | 63 |
| | NSA05_28 | OLA | 62.3 | 63.3 |
| NSA05_Receptor_43 | NSA05_29 | OLA | 62.6 | 63.2 |
| | NSA05_30 | OLA | 61.3 | 61.9 |
| | NSA05_31 | OLA | 63 | 63.7 |
| NSA05_Receptor_44 | NSA05_32 | OLA | 61.1 | 61.8 |
| | NSA05_33 | OLA | 61.7 | 62.9 |
| | NSA05_34 | OLA | 62.2 | 63.3 |
| NSA05_Receptor_45 | NSA05_35 | OLA | 63 | 64.4 |
| | NSA05_36 | OLA | 62.7 | 64.3 |
| | NSA05_37 | OLA | 62.5 | 64 |
| NSA05_Receptor_46 | NSA05_38 | OLA | 62.5 | 64 |
| | NSA05_39 | OLA | 63 | 64.2 |
| | NSA05_40 | OLA | 63.1 | 64.4 |
| NSA05_Receptor_47 | NSA05_41 | OLA | 63.8 | 64.4 |
| | NSA05_42 | OLA | 64.3 | 64.1 |
| | NSA05_43 | OLA | 64.2 | 64.3 |
| NSA05_Receptor_48 | NSA05_44 | OLA | 64.1 | 63.9 |
| | NSA05_45 | OLA | 64.3 | 64.2 |
| | NSA05_46 | OLA | 64.1 | 64.1 |
| NSA05_Receptor_49 | NSA05_47 | OLA | 63.3 | 63.6 |
| | NSA05_48 | OLA | 62.9 | 63.1 |
| | NSA05_49 | OLA | 62.7 | 62.8 |
| NSA05_Receptor_50 | NSA05_50 | OLA | 62 | 62.1 |
| | NSA05_51 | OLA | 61.2 | 61.4 |
| | NSA05_52 | OLA | 60.4 | 60.5 |
| | NSA05_53 | OLA | 58.9 | 59.1 |
| | NSA05_54 | OLA | 58.5 | 58.6 |
| | NSA05_55 | OLA | 57.8 | 58 |
| | NSA05_56 | OLA | 56.7 | 56.9 |
| | NSA05_57 | OLA | 55.9 | 55.9 |
| NSA05_Receptor_51 | NSA05_58 | OLA | 56.1 | 56.4 |
| | NSA05_59 | OLA | 55.1 | 55.3 |
| | NSA05_60 | OLA | 54.1 | 54.2 |
| NSA06_Receptor_52 | NSA06_01 | OLA | 53.6 | 53.4 |
| NSA06_Receptor_53 | NSA06_02 | OLA | 53.2 | 53.3 |
| | NSA06_03 | OLA | 53.5 | 53.7 |
| | NSA06_04 | OLA | 53.6 | 53.7 |
| NSA06_Receptor_54 | NSA06_05 | OLA | 54.5 | 54.7 |
| | NSA06_06 | OLA | 55 | 55.1 |
| | NSA06_07 | OLA | 57.5 | 57.6 |
| NSA06_Receptor_55 | NSA06_08 | OLA | 54.8 | 54.9 |
| | NSA06_09 | OLA | 55.1 | 55.1 |
| | NSA06_10 | OLA | 52.4 | 52.2 |
| NSA06_Receptor_56 | NSA06_11 | OLA | 55.6 | 55.6 |

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|---|---|---|---|---|
| | NSA06_12 | OLA | 54.5 | 54.6 |
| NSA07_Receptor_57 | NSA07_01 | OLA | 64.3 | 64.3 |
| NSA08_Receptor_58 | NSA08_01 | OLA | 62.5 | 62.5 |
| NSA08_Receptor_59 | NSA08_02 | OLA | 56.7 | 56.8 |
| | NSA08_03 | OLA | 57.1 | 57.1 |
| | NSA08_04 | OLA | 57.4 | 57.4 |
| NSA08_Receptor_60 | NSA08_05 | OLA | 55 | 55.1 |
| | NSA08_06 | OLA | 57.3 | 57.4 |
| | NSA08_07 | OLA | 57.2 | 57.3 |
| NSA09_Receptor_61 | NSA09_01 | OLA | 43.8 | 43.6 |
| | NSA09_02 | OLA | 37.8 | 37.4 |
| | NSA09_03 | OLA | 38.5 | 38.6 |
| NSA09_Receptor_62 | NSA09_04 | OLA | 38.9 | 38.7 |
| | NSA09_05 | OLA | 38.6 | 37.9 |
| | NSA09_06 | OLA | 42.2 | 42.3 |
| NSA09_Receptor_63 | NSA09_07 | OLA | 42.7 | 42.7 |
| | NSA09_08 | OLA | 43.3 | 43.3 |
| | NSA09_09 | OLA | 44 | 44 |
| NSA10_Receptor_64 | NSA10_01 | OLA | 48.5 | 48.4 |
| | NSA10_02 | OLA | 50.6 | 50.6 |
| NSA10_Receptor_65 | NSA10_03 | OLA | 52.3 | 52.5 |
| | NSA10_04 | OLA | 58.7 | 58.3 |
| | NSA10_05 | OLA | 61.6 | 62.1 |
| NSA11_Receptor_66 | NSA11_01 | OLA | 66.8 | 66.7 |
| | NSA11_02 | OLA | 61.2 | 61.1 |
| | NSA11_03 | OLA | 62.8 | 62.7 |
| NSA11_Receptor_67 | NSA11_04 | OLA | 60.5 | 60.5 |
| | NSA11_05 | OLA | 60.8 | 60.7 |
| | NSA11_06 | OLA | 59.2 | 59.1 |
| NSA11_Receptor_68 | NSA11_07 | OLA | 56.1 | 56.2 |
| | NSA11_08 | OLA | 57.1 | 57.1 |
| | NSA11_09 | OLA | 54.6 | 54.6 |
| | NSA11_10 | OLA | 53.6 | 53.6 |
| | NSA11_11 | OLA | 43.5 | 43.3 |
| NSA11_Receptor_69 | NSA11_12 | OLA | 49 | 49.1 |
| | NSA11_13 | OLA | 49.4 | 49.1 |
| | NSA11_14 | OLA | 54.2 | 53.8 |
| | NSA11_15 | OLA | 57.2 | 57.2 |
| | NSA11_16 | OLA | 54.4 | 54.5 |
| NSA12_Receptor_70 | NSA12_01 | OLA | 64.9 | 64.9 |
| | NSA12_02 | OLA | 64.2 | 64.4 |
| | NSA12_03 | OLA | 64.5 | 65.6 |
| NSA12_Receptor_71 | NSA12_04 | OLA | 64.2 | 65.1 |
| | NSA12_05 | OLA | 64.9 | 65 |
| | NSA12_06 | OLA | 66.1 | 65.9 |
| NSA12_Receptor_72 | NSA12_07 | OLA | 66.8 | 66.6 |
| | NSA12_08 | OLA | 66.5 | 66.3 |

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|---|---|---|---|---|
| | NSA12_09 | OLA | 65.3 | 65.2 |
| NSA12_Receptor_73 | NSA12_10 | OLA | 65.3 | 65.3 |
| | NSA12_11 | OLA | 65.5 | 65.5 |
| | NSA12_12 | OLA | 64.5 | 64.5 |
| | NSA12_13 | OLA | 64 | 64 |
| | NSA12_14 | OLA | 63.8 | 63.8 |
| | NSA12_15 | OLA | 62.9 | 62.9 |
| | NSA12_16 | OLA | 61.5 | 61.5 |
| | NSA12_17 | OLA | 59.9 | 59.6 |
| | NSA12_18 | OLA | 58.7 | 58.8 |
| | NSA12_19 | OLA | 56.2 | 56.1 |
| NSA12_Receptor_74 | NSA12_20 | OLA | 70.9 | 70.9 |
| | NSA12_21 | OLA | 69.9 | 70 |
| | NSA12_22 | OLA | 69.1 | 69.1 |
| NSA12_Receptor_75 | NSA12_23 | OLA | 68.4 | 68.4 |
| | NSA12_24 | OLA | 68.4 | 68.3 |
| | NSA12_25 | OLA | 67.3 | 67.3 |
| NSA12_Receptor_76 | NSA12_26 | OLA | 66.4 | 66.4 |
| | NSA12_27 | OLA | 65.7 | 65.8 |
| | NSA12_28 | OLA | 65.7 | 65.7 |
| NSA12_Receptor_77 | NSA12_29 | OLA | 65.4 | 65.4 |
| | NSA12_30 | OLA | 65.1 | 65.2 |
| | NSA12_31 | OLA | 64.6 | 64.6 |
| NSA12_Receptor_78 | NSA12_32 | OLA | 65.6 | 65.7 |
| | NSA12_33 | OLA | 61.1 | 61.1 |
| NSA12_Receptor_79 | NSA12_34 | OLA | 63.5 | 63.3 |
| | NSA12_35 | OLA | 62.7 | 62.6 |
| | NSA12_36 | OLA | 62.1 | 62.1 |
| | NSA12_37 | OLA | 61 | 60.9 |
| | NSA12_38 | OLA | 60.5 | 60.4 |
| | NSA12_39 | OLA | 56.8 | 56.5 |
| | NSA12_40 | OLA | 51.1 | 50.6 |
| NSA12_Receptor_80 | NSA12_41 | OLA | 61.1 | 61.2 |
| | NSA12_42 | OLA | 60.6 | 60.7 |
| | NSA12_43 | OLA | 61.3 | 61.3 |
| NSA12_Receptor_81 | NSA12_44 | OLA | 61 | 61.2 |
| | NSA12_45 | OLA | 60.7 | 60.7 |
| | NSA12_46 | OLA | 61.1 | 61.1 |
| NSA12_Receptor_82 | NSA12_47 | OLA | 57.3 | 57.3 |
| | NSA12_48 | OLA | 58.5 | 58.4 |
| | NSA12_49 | OLA | 59.5 | 59.5 |
| NSA12_Receptor_83 | NSA12_50 | OLA | 59.2 | 59.3 |
| | NSA12_51 | OLA | 59.2 | 59.3 |
| | NSA12_52 | OLA | 59.4 | 59.4 |
| | NSA12_53 | OLA | 58.7 | 58.6 |
| | NSA12_54 | OLA | 55.4 | 55.3 |
| | NSA12_55 | OLA | 54.9 | 54.9 |

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|---|---|---|---|---|
| NSA12_Receptor_84 | NSA12_56 | OLA | 52.8 | 52.9 |
| | NSA12_57 | OLA | 53.8 | 53.8 |
| | NSA12_58 | OLA | 53.5 | 53.4 |
| | NSA12_59 | OLA | 55.9 | 56 |
| | NSA12_60 | OLA | 56.3 | 56.3 |
| | NSA12_61 | OLA | 56.7 | 56.6 |
| | NSA12_62 | OLA | 55.3 | 55.3 |
| NSA12_Receptor_85 | NSA12_63 | OLA | 55.1 | 55.1 |
| | NSA12_64 | OLA | 55 | 55 |
| | NSA12_65 | OLA | 54.2 | 54.2 |
| NSA12_Receptor_86 | NSA12_66 | OLA | 53.4 | 53.4 |
| | NSA12_67 | OLA | 53.4 | 53.4 |
| NSA13_Receptor_87 | NSA13_01 | OLA | 51.8 | 51.8 |
| | NSA13_02 | OLA | 50.5 | 50.5 |
| | NSA13_03 | OLA | 51.4 | 51.5 |
| | NSA13_04 | OLA | 51 | 51.1 |
| | NSA13_05 | OLA | 51.1 | 51.1 |
| | NSA13_06 | OLA | 50.6 | 50.6 |
| NSA14_Receptor_88 | NSA14_01 | OLA | 63.3 | 63.5 |
| | NSA14_02 | OLA | 60.1 | 60.2 |
| | NSA14_03 | OLA | 57.7 | 57.8 |
| NSA14_Receptor_89 | NSA14_04 | OLA | 56.2 | 56.3 |
| | NSA14_05 | OLA | 54.9 | 54.6 |
| | NSA14_06 | OLA | 53.8 | 53.9 |
| NSA14_Receptor_90 | NSA14_07 | OLA | 52.2 | 52.3 |
| | NSA14_08 | OLA | 39.1 | 38.8 |
| | NSA14_09 | OLA | 47.1 | 47.1 |