Secondary Noise Screening Process Guide
Secondary Noise Screening Process Guide

September 2016, Version 4.0 (Draft)

For more information on this report, please contact the Environmental Approvals Access and Service Integration Branch Ministry of the Environment and Climate Change Toll free 1-800-461-6290
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PIBS 6888e
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PART A  BACKGROUND
This document replaces the “Secondary Noise Screening Process for S.9 Applications Supplement to Application for Approval, Version 3.0” (November 2009), PIBS 6888e.

A.1 Purpose
This document provides details on the Secondary Noise Screening Process and instructs the form preparer (the Preparer) on how to complete the Secondary Noise Screening Process Form.

A.2 Legislative Background
The Secondary Noise Screening Process may be used to assess noise emissions from a facility for the purpose of satisfying the noise assessment requirements for applications made under Section 20.2 in Part II.1 of the Environmental Protection Act (EPA), or for the purpose of meeting other regulatory requirements.

For information regarding the approval process under Part II.1 (Environmental Compliance Approvals) of the EPA see the “Guide to Applying for an Environmental Compliance Approval” as amended.

A.3 Noise Assessment Options
There are three processes that may be used to assess the impact of noise from a facility: the Primary Noise Screening Process, the Secondary Noise Screening Process, or an Acoustic Assessment. Depending upon the nature of the facility and the location of noise receptors, a facility may be able to adequately assess noise emissions by completing the Primary Noise Screening Process or the Secondary Noise Screening Process. If the facility is not eligible for the Primary Noise Screening Process or the Secondary Noise Screening Process then an Acoustic Assessment Report must be completed.

1. **Primary Noise Screening Process**: does not require detailed calculations and uses conservative assumptions for potential noise sources at the facility to calculate the Minimum Separation Distance (MSD). The Primary Noise Screening Process is based on confirming that there is a sufficient separation distance between a facility’s noise sources and the closest Point of Reception (POR) to ensure that the facility’s noise emissions will not exceed the MOECC noise guidelines set out in “Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning, Publication NPC-300 (NPC-300)”. See the Primary Noise Screening Guide for more details.

2. **Secondary Noise Screening Process**: is less conservative and more rigorous than the Primary Noise Screening Process but less intensive than preparing an Acoustic Assessment Report. The Secondary Noise Screening Process uses calculations and site-specific conditions to predict sound levels at nearby Points of Reception and ensure that the facility’s noise emissions will not exceed ministry noise guidelines set out in NPC-300. The Secondary Noise Screening Process considers the: location of noise sources relative to the POR; effect of barriers that break the line-of-sight; tonality; intermittency of operation; and background noise from major highways/roadways. The preparer is not required to attempt the Primary Noise Screening Process prior to submitting a Secondary Noise Screening Process Form.
The Secondary Noise Screening Process is designed to be completed by a Qualified Individual with a rudimentary knowledge of acoustics and a basic understanding of applicable MOECC noise guidelines but does not need to be completed by an Acoustical Consultant.

3. **Acoustic Assessment Report**: is based on a detailed noise review of the noise sources at the facility and their impacts on neighboring PORs. If the facility is not eligible for the Primary Noise Screening Process and/or the Secondary Noise Screening Process then an Acoustic Assessment Report is required. It is not required that the Primary Noise Screening Process or the Secondary Noise Screening Process be attempted prior to submitting an Acoustic Assessment Report.


Please note that Environmental Compliance Approval applications will not be accepted without the inclusion of: an eligible and complete Primary Noise Screening Process Form that meets the requirements of the Primary Noise Screening Process; or an eligible and complete Secondary Noise Screening Process Form that meets the requirements of the Secondary Noise Screening Process; or a complete Acoustic Assessment Report.

**A.4 Implementation by the MOECC**

After its publication date, this document will be implemented by the MOECC. All new applications for MOECC approvals submitted after this document is published will be assessed in accordance with this document. Applications that were submitted to the MOECC before this document has been published will be assessed under the previously applicable document entitled “Secondary Noise Screening Process for S.9 Applications Supplement to Application for Approval, Version 3.0” (November 2009), PIBS 6888e.

**A.5 How to Use this Document**

This document should be read in conjunction with the following MOECC documents or their successors, as amended:

- Guide to Applying for an Environmental Compliance Approval (December 2012), PIBS 8527e;
- Basic Comprehensive Certificates of Approval (Air & Noise) - User Guide (March 2011), PIBS 4391e01;
- Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning, Publication NPC-300 (August 2013), PIBS 8458e1;
- Noise Red Flag Tables, Ministry of the Environment and Climate Change (1997)
- Sound Level Adjustments, Publication NPC-104 (August 1978), contained in the Model Municipal Noise Control By-Law, Final Report, (August 1978); and

The Secondary Noise Screening Process may only use data from the Noise Red Flag Tables and manufacturers’ published noise data. Sound data obtained by measurements at the facility are not acceptable for use in the Secondary Noise Screening Process.
This document has three main sections:

- Part A: provides background information;
- Part B: instructs the Preparer on how to complete the Secondary Noise Screening Process Form; and
- Part C: outlines a quality control/assurance protocol that must be followed.

All website addresses referred to in this document were current at the time of release.

While every effort has been made to ensure the accuracy of the information contained in this document, it should not be construed as legal advice.

A.6 Confidentiality

Information contained in the Secondary Noise Screening Process Form is part of the public file and will be made available to the public upon request. Information submitted as supporting information may be claimed as confidential but will be subject to the Freedom of Information and Protection of Privacy Act process. If confidentiality is not claimed at the time of submitting the information, the MOECC may make the information available to the public without further notice to the Preparer.

A.7 Definitions

“Actual Separation Distance”
means the distance from the closest facility wall or outside noise source, such as dust collector located outside the facility, to the property line of the Point of Reception

“Preparer”
The person or persons who prepared the Secondary Noise Screening Process Form

“Sound Power Level”
means ten times the logarithm to the base of the ratio of a given sound power in a stated frequency band, to the reference power of one picowatt

Refer to “Technical Definitions, Publication NPC-101 (August 1978)” for the following definitions:
- A-weighted Sound Pressure Level
- Sound Level
- Tonality

Refer to “Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning, Publication NPC-300” (August 2013), PIBS 8458e1, for the following definitions:
- Class 1, 2, 3 and 4 areas
- Noise
- Point of Reception
- Predictable worst case noise impact
A.8  Acronyms
ASD: Actual Separation Distance

MOECC: Ministry of the Environment and Climate Change

NAICS: North American Industry Classification System

NPC-104: Sound Level Adjustments, Publication NPC-104

NPC-300: Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning, Publication NPC-300 (August 2013), PIBS 8458e1

POR: Point of Reception

PORs: Points of Reception

Sound Level: SL

Sound Power Level: \( L_W \)

A.9  Questions
For any questions or revisions to this document, or to obtain a Secondary Noise Screening Process Form, see MOECC’s website at: http://www.ontario.ca/search/noise-and-sound-level-assessments-sample-applications-guides-and-resources

or contact:

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Email: EAASIBGen@ontario.ca
PART B  SECONDARY NOISE SCREENING PROCESS

This section explains how to complete the Secondary Noise Screening Process Form.

B.1  Confirm Eligibility and Describe Facility (Step 1)

The Secondary Noise Screening Process does not apply to:

- Facilities with a POR in a Class 4 area;
- Applications for Renewable Energy Approvals;
- Facilities with trucks that have refrigeration units or truck loading/unloading utilizing truck blowers or outdoor pumps on site; and
- Facilities with significant impulsive and/or vibration sources, including, but not limited to, stamping presses or forging hammers.

The Preparer must provide a description of the facility including type of operation, activities, manufacturing processes, and must specify operating hours for the facility/equipment. The Preparer must also provide a description of the surrounding area, including transportation corridors and other factors relevant in the determination of the acoustical classification of the study area.

B.2  Identify the Facility’s Noise Sources (Step 2)

The Preparer must identify and describe all noise sources (i.e., both significant and insignificant). Significant noise sources include equipment or operations that contribute to SL at the PORs. The Preparer must provide a unique source label and source description for all significant noise sources. The unique source label may be used from the Emissions Summary Dispersion Modelling Report where applicable.

Source descriptions must include all information that is relevant to calculating noise emissions. Applicable information may be obtained from the Noise Red Flag Tables or manufacturer’s published data.

Some examples of typical noise sources that must be considered are:

<table>
<thead>
<tr>
<th>Asphalt Plants</th>
<th>Incinerators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boilers</td>
<td>Inverters</td>
</tr>
<tr>
<td>Burners</td>
<td>Openings (windows, louvres, vents)</td>
</tr>
<tr>
<td>Chillers</td>
<td>Paint Spray Booths</td>
</tr>
<tr>
<td>Compressors</td>
<td>Pumps (used outdoors)</td>
</tr>
<tr>
<td>Condensers</td>
<td>Sandblasting Equipment</td>
</tr>
<tr>
<td>Concrete Manufacturing/Processing Equipment</td>
<td>Screeners</td>
</tr>
<tr>
<td>Cooling Towers</td>
<td>Scrubbers</td>
</tr>
<tr>
<td>Crushers</td>
<td>Shredders</td>
</tr>
<tr>
<td>Dryers</td>
<td>Transformers</td>
</tr>
<tr>
<td>Dust Collectors (Cyclones, Bag Houses)</td>
<td>Trucks – on-site idling, loading and unloading</td>
</tr>
</tbody>
</table>
Secondary Noise Screening Process

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- Electric Motors
- Electrical Power Generators (Diesel/Natural Gas, Continuous & Standby)
- Engines (Diesel/Natural Gas)
- Fans and Blowers
- Flares
- Furnaces
- Garbage Compactors
- HVAC Units (Air Make-up Units, Air Conditioners, etc.)

<table>
<thead>
<tr>
<th>Electric Motors</th>
<th>Trucks – forklifts or other mobile material handling equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical Power Generators (Diesel/Natural Gas, Continuous &amp; Standby)</td>
<td>Tub Grinders/ Wood Chippers/ Debarking</td>
</tr>
<tr>
<td>Engines (Diesel/Natural Gas)</td>
<td>Drums</td>
</tr>
<tr>
<td>Fans and Blowers</td>
<td>Turbines</td>
</tr>
<tr>
<td>Flares</td>
<td>Valves/ Jets/ Nozzles</td>
</tr>
<tr>
<td>Furnaces</td>
<td>Welding Equipment</td>
</tr>
<tr>
<td>Garbage Compactors</td>
<td>Woodworking Equipment</td>
</tr>
</tbody>
</table>

B.3 Complete Secondary Noise Screening Assessment (Step 3)

To complete Step 3 of the Secondary Noise Screening Process Form the Preparer must obtain and refer to a Site Plan, a Land Use Zoning Designation Plan and a Scaled Area Location Plan. The noted required plans must be provided with the submission of the Secondary Noise Screening Form and must meet the requirements set out below.

Site Plan

The Site Plan must identify the following aspects of the site:

- Property boundaries;
- Land topography;
- Existing structures; and
- Major and local roads.

The Site Plan must also include a legend, scale and a north arrow.

Land Use Zoning Designation Plan

The Land Use Zoning Designation Plan must identify the zoning designation (e.g., commercial use) of the surrounding area and include a legend, scale and a north arrow.

Land Use Zoning Designation Plans can be obtained from the municipality’s planning department.

Scaled Area Location Plan

The Scaled Area Location Plan must identify:

- Topography and nature of the neighbourhood surrounding the facility;
- Location of adjacent buildings and structures;
- Location of all significant noise sources;
- The most affected PORs;
- The relative location of the PORs to any 400 series and/or provincial highways and regional roads. This distance is measured from the edge of the pavement of the highway/roadway to the property line of the POR (see Figure 1); and
- Acoustic barriers or structures that break the line of sight between the source(s) and POR(s).
The Scaled Area Location Plan must also include a legend, scale and a north arrow.

Base maps showing the surrounding neighbourhood may be obtained from the municipality, the Ministry of Natural Resources and Forestry or other mapping companies.

Steps 3.1, 3.2, 3.3 and 3.4 described below must be repeated for each POR that is identified for assessment. See ‘B.3.1 Identify the Most Affected Points of Reception’ for instructions on how to identify the most affected PORs.

**B.3.1 Identify the Most Affected Points of Reception (Step 3.1)**

The most affected PORs can be determined based on close proximity and wide exposure to the noise sources, and absence of elevated background noise.

For each POR that has been identified for assessment, the Preparer must: provide a description of the POR including a description of its zoning and structures (e.g., two-story single family dwellings), and direction relative to the facility (e.g., north-west); the applicable NPC-300 acoustical classification; and identify if the POR is within 100 metres of the edge of pavement of a 400 series highway (e.g., Highway 401); or within 30 metres of the edge of pavement of a provincial highway (e.g., Highway 27) or regional road (e.g., Keele Street).

![Figure 1](image_url)

**Figure 1**
B.3.2 Identify the Applicable Sound Level Limits (Step 3.2)
Using NPC-300, determine and identify the applicable SL limits for each POR identified in Step 3.1.

SL limits can be increased by 5 dBA for PORs within: 100 metres of the edge of pavement of a 400 series highway; or 30 metres of the edge of pavement of a provincial highway or regional road. See Figure 1 above.

B.3.3 Calculate Sound Level (Step 3.3)
The Preparer must calculate SL for each of the facility’s noise sources identified in Step 2 at each POR identified in Step 3.1.

The Preparer is required to confirm that the noise sources identified in Step 2 contribute to SL at the POR being assessed.

For all noise sources impacting a POR, the Preparer must:

- identify the source of data that will be used for the calculation of SL;
- provide barrier adjustment, tonality adjustment and intermittency adjustment as applicable;
- provide required variables; and
- determine SL using applicable equation.

Acceptable sources of data include: Noise Red Flag Tables, manufacturer’s specification of Sound Power Levels and manufacturer’s specifications of Sound Levels at a distance. Acceptable forms of manufacturer’s data are restricted to published data. If the noise source is truck traffic, then identify “On-Site Trucks” as the source of data.

As applicable, a summary of the Noise Red Flag data used and/or the manufacturer’s published data used must be provided with the application.

Each source of data has an associated equation, Equation 1 – 3 below; however, if the noise source is truck traffic, then Equation 4 must be used.

As applicable, the following explanations will help the Preparer complete Step 3.3:

Determining ASD
The ASD is measured from the noise source to the closest property line of the POR. See Figure 2 below:
For PORs in Class 3 areas, where properties may be larger and may include areas that would not be considered noise-sensitive, PORs only include locations within 30 metres of a dwelling or camping area where sound or vibration originating from other than those premises is received.

**EQUATION 1 – Noise Red Flag Tables**

If the Noise Red Flag Tables are the source data, the following equation must be used to determine the SL at PORs:

\[
SL = 50 - 20 \times \log_{10}\left(\frac{D_A}{D_{50}}\right) - \text{Barrier Adjustment} + \text{Tonality Adjustment} + \left(10 \times \log_{10}\left(\frac{t}{60}\right)\right)
\]

Where:
- \(D_A\) = ASD from the noise source to the closest property line of the POR measured in metres
- \(D_{50}\) = Noise Red Flag Table distance corresponding to the 50 dBA criterion measured in metres

Barrier Adjustment = 5 dBA

if an acoustic barrier (as defined in NPC-300) breaks the line of sight between the source and the POR.
Tonality Adjustment = 5 dBA if the noise is tonal, in accordance with NPC-104.

Intermittency Adjustment = \(10 \times \log_{10}\left(\frac{t}{60}\right)\) if the noise source operation is intermittent, the Preparer must provide the duration of the operation, \(t\), measured in minutes per hour.

**EQUATION 2 – Manufacturer’s Specifications of Sound Power Levels**
Acceptable forms of manufacturer’s data are restricted to published data. If a manufacturer’s specification providing a \(L_W\) is the source data, then the following calculation may be used:

\[
SL = L_W - 10 \times \log_{10}(2\pi D_A^2) - \text{Barrier Adjustment} + \text{Tonality Adjustment} + \left(10 \times \log_{10}\left(\frac{t}{60}\right)\right)
\]

Where:
\(L_W\) = Sound Power Level in dBA
\(D_A\) = ASD from the noise source to the closest property line of the POR measured in metres

Barrier Adjustment = 5 dBA if an acoustic barrier (as defined in NPC-300) breaks the line of sight between the source and the POR.

Tonality Adjustment = 5 dBA if the noise is tonal, in accordance with NPC-104.

Intermittency Adjustment = \(10 \times \log_{10}\left(\frac{t}{60}\right)\) if the noise source operation is intermittent, the Preparer must provide the duration of the operation, \(t\), measured in minutes per hour.
EQUATION 3 – Manufacturer’s Specifications of Sound Level at a Distance

Acceptable forms of manufacturer’s data are restricted to published data.

If the source data is the manufacturer’s specification of the SL measured from a reference distance, then the following calculation may be used:

\[ SL = SL_{ref} - 20 \times \log_{10} \left( \frac{D_A}{D_{ref}} \right) + K_{size} - \text{Barrier Adjustment} + \text{Tonality Adjustment} + \left( 10 \times \log_{10} \left( \frac{t}{60} \right) \right) \]

Where:

- \( SL_{ref} \) = SL provided by the manufacturer at a \( D_{ref} \) distance measured in metres
- \( D_A \) = ASD from the noise source to the closest property line of the POR measured in metres
- \( D_{ref} \) = reference distance provided by the manufacturer measured in metres

If \( D_{ref} \) is greater than each of the length, width and height dimensions of the source, then:

\[ K_{size} = 0. \]

If any one of the source dimensions is greater than \( D_{ref} \), then:

\[ K_{size} = 10 \times \log_{10} \left( \frac{S_{ref}}{2\pi D_{ref}^2} \right) \]

Where, \( S_{ref} \) is the surface area enveloping the source excluding ground surface, at the reference distance of \( D_{ref} \) from the surface of the source. For a rectangular source with dimensions of \( L, W \) and \( H \), the enveloping surface area is:

\[ S_{ref} = 2 \times (H + D_{ref}) \times (L + W + 4D_{ref}) + (L + 2D_{ref}) \times (W + 2D_{ref}) \]

For a non-rectangular source, perform the calculations using a rectangular source with dimensions of \( L, W \) and \( H \) that envelops the source. Figure 3 below shows a graphic illustration of such an approximation:
Barrier Adjustment = 5 dBA

if an acoustic barrier (as defined in NPC-300) breaks the line of sight between the source and the POR.

Tonality Adjustment = 5 dBA

if the noise is tonal, in accordance with NPC-104.

Intermittency Adjustment = \( 10 \times \log_{10} \left( \frac{t}{60} \right) \)

if the noise source operation is intermittent, the Preparer must provide the duration of the operation, \( t \), measured in minutes per hour.
EQUATION 4 – On-site Trucks

\[
SL = LW - 10\log_{10}(2\pi D_A^2) + 10\log_{10}(N) - \text{Barrier Adjustment} + 10 \times \log_{10}\left(\frac{t}{60}\right)
\]

If there is truck traffic on the site, then the following equation must be used:

Where:
- \(L_W = 96 \text{ dBA}\); the sound power level of each truck
- \(D_A = \text{ASD from the noise source to the closest property line of the POR measured in metres}\)
- \(N = \text{the maximum number of trucks on-site within 1 hour}\)
- \(\text{Barrier Adjustment} = 5 \text{ dBA}\) if an acoustic barrier (as defined in NPC-300) breaks the line of sight between the source and the POR.
- \(\text{Intermittency Adjustment} = 10 \times \log_{10}\left(\frac{t}{60}\right)\) if the truck's operation is intermittent, the Preparer must provide the duration of the operation, \(t\), measured in minutes per hour.
B.3.4 Calculate Cumulative Impact/Combined Sound Levels (Step 3.4)
The Preparer must determine the combined noise impacts by calculating the cumulative impact/combined SL for each POR identified in Step 3.1. The Preparer must use Equation 5 to combine the individual SL into a total SL at a POR. An example has been provided.

EQUATION 5 – Cumulative Impact/Combined SLs
The total SL produced by noise sources is calculated using the following equation:

\[ SL_{\text{Total}} = 10 \log_{10} \left( 10^{\frac{SL_1}{10}} + 10^{\frac{SL_2}{10}} + \ldots + 10^{\frac{SL_N}{10}} \right) \]

Where:
SL\(_1\) – SL for first noise source,
SL\(_2\) – SL for second noise source,
SL\(_N\) – SL for final noise source

Refer to Appendix A of the Secondary Noise Screening Form for a summary of SL predictions and cumulative impact/combined SLs. The cumulative impact/combined SL must be in compliance with MOECC SL limits at each assessed POR. Refer to NPC-300 to confirm that the combined noise impacts for each POR meet the SL limits.
PART C  QUALITY CONTROL/QUALITY ASSURANCE (QC/QA) PROTOCOL

This section provides information on the QC/QA protocol that must be followed for the Secondary Noise Screening Process Form.

In addition to the requirements outlined in the “Guide to Applying for an Environmental Compliance Approval” (February 2014), PIBS 8527e, the Secondary Noise Screening Process Form must include:

1. Tables, Figures & Calculation Verification
2. Signing Authority Statement
3. Preparer Statement

C.1 Tables, Figures & Calculation Verification (Step 5)

The Secondary Noise Screening Form will not be accepted without confirmation of the following:

- Tables in Appendix A have been verified and meet the Secondary Noise Screening Process Guide’s requirements;
- A Site Plan is attached that meets the Secondary Noise Screening Process Guide’s requirements;
- A Land Use Zoning Designation Plan is attached that meets the Secondary Noise Screening Process Guide’s requirements; and
- A Scaled Area Location Plan is attached that meets the Secondary Noise Screening Process Guide’s requirements.

Additionally, the Preparer is required to attach the appropriate data with the submission:

- A Summary of Noise Red Flag Table Data used is attached, if applicable; and/or
- Manufacturer’s Noise Data is attached, if applicable.

C.2 Signing Authority Statement (Step 6)

The signing authority for the facility/operation must sign and date the ‘Signing Authority Statement’ and initial all of the statements in the spaces provided.

Only handwritten signatures will be accepted.

C.3 Preparer Statement (Step 7)

The individual that prepared the Secondary Noise Screening Process Form must sign and date the ‘Preparer Statement’ and initial all of the statements in the spaces provided.

Only handwritten initials and signatures will be accepted.