



SEPP N-1 AND NIRV EXPLANATORY NOTES

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WHAT PUBLICATIONS COVER INDUSTRY NOISE IN VICTORIA?

Figure 1 illustrates the suite of publications setting or offering guidance on industry noise levels and limits in Victoria. In addition to this publication (the highlighted box in the figure), they are:

- *Noise from industry in regional Victoria* ('NIRV' – EPA publication 1411)
- *State Environment Protection Policy (Control of Noise from Commerce, Industry and Trade) No. N-1* ('SEPP N-1')
- *Applying NIRV to proposed and existing industry* ('the Applying NIRV guide' – EPA publication 1413)

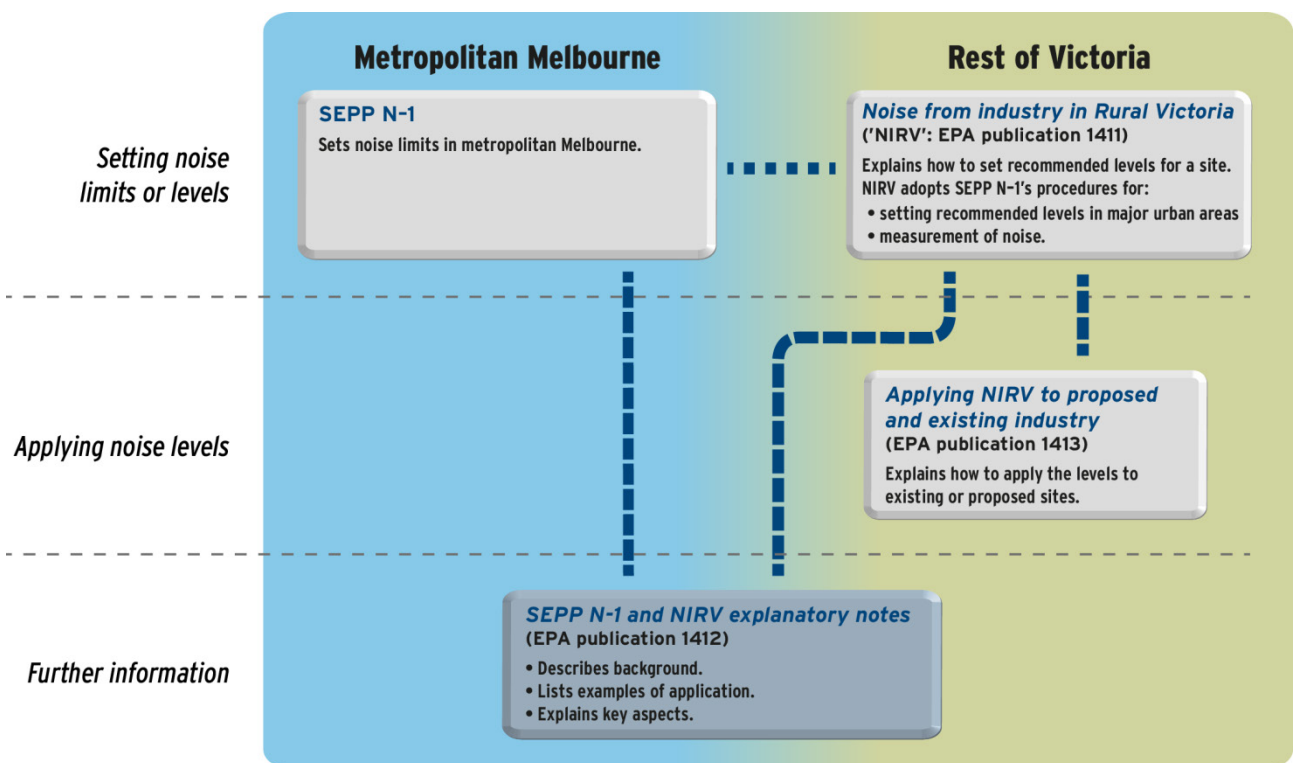


Figure 1: The publications covering noise levels and limits in Victoria

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INTRODUCTION

This document explains the industry noise standards that apply in Victoria:

- *State Environment Protection Policy (Control of Noise from Commerce, Industry and Trade) No. N-1 (SEPP N-1)*
- *Noise from industry in regional Victoria: Recommended maximum noise levels from commerce, industry and trade premises in regional Victoria (NIRV; EPA publication 1411).*

SEPP N-1 and NIRV manage the impact of noise from commercial, industrial and trade premises on residential and other noise-sensitive uses.

SEPP N-1 or NIRV should be consulted to determine the acceptable noise levels from industry. There is also *Applying NIRV to proposed and existing industry*, which assists regulators in applying NIRV to a site.

This document gives further background and information on SEPP N-1 and NIRV, through explanation of key policy settings and examples of application.

1 OVERVIEW OF SEPP N-1 AND NIRV

The premises SEPP N-1 and NIRV apply to

SEPP N-1 and NIRV apply to noise from all scales of 'commercial, industrial and trade premises.' For the full definition, see SEPP N-1, Part VI.

Commercial, industrial or trade premises include factories, businesses, farming, mines and quarries. They do not include noise from road and rail corridors or noise from residential premises.

In these explanatory notes, the term 'industry' means 'commercial, industrial or trade premises'.

Where SEPP N-1 and NIRV apply

SEPP N-1 sets **noise limits** for industry in the Melbourne 'metropolitan region.' This area covers much, but not all of the greater Melbourne area (see Figure 1).

NIRV applies in all locations outside the SEPP N-1 area in the state of Victoria. It sets 'recommended maximum noise levels' (recommended levels).

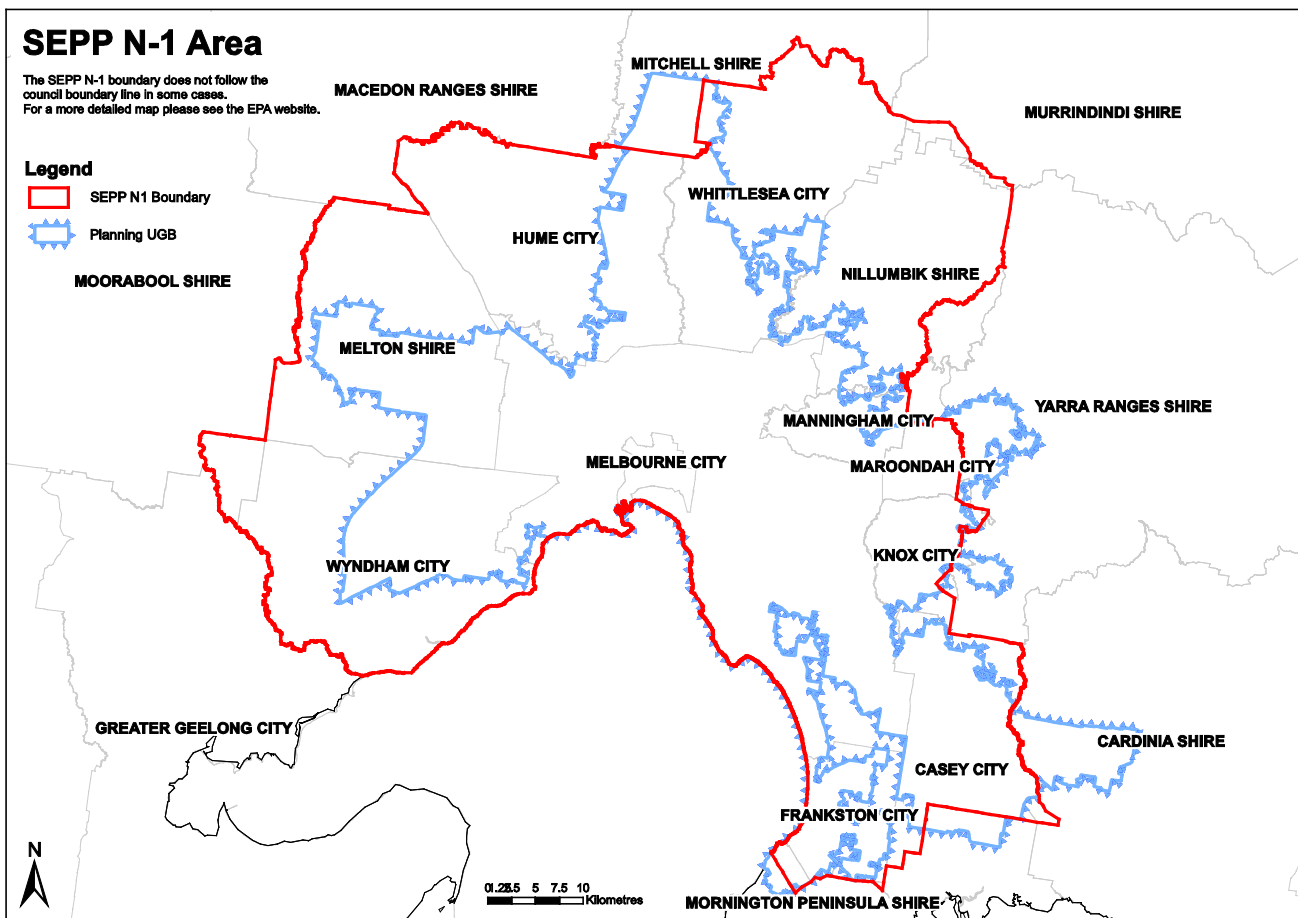


Figure 2: Area covered by SEPP N-1.

These explanatory notes apply to both SEPP N-1 and NIRV. When addressing noise from a particular site, consult only the document relevant to its geographic location.

For further information on the SEPP N-1 area please go to the EPA website: www.epa.vic.gov.au/noise

SEPP N-1 and NIRV are mainly relevant to:

- businesses that emit noise
- government authorities that issue approvals for businesses, such as planning authorities and EPA
- government officers investigating noise problems
- residents concerned about noise
- acoustic consultants and engineers.

If applying SEPP N-1, you should consult

- the consolidated SEPP N-1
- these explanatory notes
- *Designation of types of zones and reservations in the Metropolitan Region Planning Schemes for the Purposes of State Environment Protection Policy (Control of Noise from Commerce, Industry and Trade) No. N-1* (EPA publication 316a).

If applying NIRV, you should consult:

- NIRV
- these explanatory notes
- the Applying NIRV guide.

When to apply SEPP N-1 or NIRV

SEPP N-1 or NIRV should be applied when:

- siting or designing new or expanded industry or plant
- government authorities assess applications for industry
- measuring noise from industrial premises
- resolving noise issues from industrial premises (including those existing before the publication of this document)
- making planning decisions on land zoning and land-use separation (e.g. rezoning land near industry)

What SEPP N-1 and NIRV protect

SEPP N-1 sets noise limits. NIRV sets recommended maximum noise levels (recommended levels). These apply to noise impacting on 'noise-sensitive areas'.

Noise-sensitive areas are mainly residential properties, but can include, for example, motels and tourist establishments, and hospitals. For a full definition, see SEPP N-1, Part VI.

SEPP N-1 and NIRV aim to protect people from industry noise that may affect normal domestic and recreational activities including, in particular, sleep at night. SEPP N-1 and NIRV do this by setting the benchmarks for control of industry noise emissions and the procedures for noise measurement.

SEPP N-1 and NIRV balance the need for operation of industry with the protection of sensitive uses. Consequently, the level of protection they provide is not the same in all circumstances. Different levels apply depending on the planning land-use zoning and the amount of 'background noise' in the area.

How SEPP N-1 and NIRV differ from each other

In the Melbourne metropolitan area, compliance with SEPP N-1 – including its noise limits – is mandatory under Section 46 of the *Environment Protection Act 1970*.

NIRV, which applies outside of Melbourne metropolitan area, is a guidance document. The levels are applied through a statutory instrument such as a notice or permit.

Both documents provide procedures for determining the noise limits or recommended levels. SEPP N-1 also provides the procedures for measuring noise, which NIRV adopts.

SEPP N-1 has environment improvement plan provisions that can be applied in limited cases where industrial premises cannot meet the noise limits.

NIRV has provisions for managing noise from proposals or existing sites that cannot meet the recommended levels. These are explained in NIRV and *Applying NIRV to proposed and existing industry*.

How SEPP N-1 and NIRV set noise levels

Overview

SEPP N-1 and NIRV provide procedures for determining **limits** or **recommended levels**, respectively, to be met at sensitive land-use sites.

Different limits and recommended levels apply in the day, evening and night periods of site operation, with lower levels required at night.

SEPP N-1 provides the method for setting noise limits for all industry noise in the Melbourne metropolitan region.

NIRV has two approaches to setting recommended levels, depending on the area where the industry is located:

- In larger cities and at the urban fringe of Melbourne (NIRV 'major urban areas'), NIRV uses the procedures in SEPP N-1 to set recommended levels. Although SEPP N-1 procedures are used, the calculated levels are not legally binding in these circumstances.
- In 'rural areas', including small towns, NIRV has a separate procedure for setting recommended levels.

Planning land zoning is assessed

SEPP N-1 and NIRV primarily set their limits and recommended levels according to the land-use zoning

of the area. The level of noise allowed in an area is based on the purpose of the local land-use zones, including the degree of industrial use permitted. Higher limits or recommended levels are generally allowed in industrial areas, and lower levels apply in residential or rural living areas.

Land-use zoning-based noise limits exemplify the concept of 'reasonable amenity expectations' for an area, a principle that is applied in planning and nuisance law. The concept relates to what can be reasonably expected to occur, rather than the actual uses and local environment at a point in time.

Background levels may be assessed

Land-use zoning is the first step to determining appropriate noise levels, but the 'background levels' in the local area are also considered in many cases. The background level is the normal, quiet state of the area and comes from remote traffic and activity. It does not include local industry noise.

The intrusiveness of industry noise is affected by how much it exceeds background noise levels. In noisier areas, such as near heavily trafficked roads, industry noise can be higher without necessarily being intrusive.

Under SEPP N-1, background levels must be assessed in all cases. SEPP N-1 then compares the allowable noise based on land-use zoning, to the background levels. The final noise limits reflect both the land-use zoning and the local background levels.

Under NIRV, background levels are not always assessed. In major urban areas under NIRV, SEPP N-1 procedures are adopted. In rural areas, NIRV presumes that the background levels will be low. Therefore, background levels are only checked where there is a prominent local noise source such as a freeway or highway.

Lower noise levels for multiple industries

The noise limits and recommended levels apply to the total of all industrial noise in the area. As noise from multiple premises can add together, this means that individual sites may need to be quieter than the SEPP N-1 noise limits or NIRV recommended levels.

How noise is measured under SEPP N-1 and NIRV

Noise is measured at noise-sensitive areas using the procedures in SEPP N-1. They set out how to measure the noise (and make appropriate adjustments to the measurement) to obtain an 'effective noise level'.

The adjustments take into account the character of the noise (such as more annoying tones or hammering), where the noise is measured (near reflecting surfaces, or indoors), and how long it can be heard in a half-hour period. For example, where there is a prominent tonal character to the noise (such as whining or humming), a +5 decibel 'penalty' is applied to the measured noise.

The effective noise level is the sum of the measured level and any adjustments that apply. This is the level that is compared to the SEPP N-1 noise limits or NIRV recommended levels to assess compliance.

2 EXPLANATION OF SEPP N-1

State environment protection policies, including SEPP N-1, are statutory policies made under the *Environment Protection Act 1970* (EP Act). SEPPs are law and compliance with SEPP N-1 is mandatory under s46 of the EP Act, regardless of whether the site is directly regulated by EPA.

This section helps to explain the structure of SEPP N-1, its terminology, its relationship to the EP Act and how it is followed to establish noise limits and measure noise. It refers to either SEPP N-1 or 'the Policy' interchangeably.

Relevant documents

As part of making a SEPP, it is published in the *Victorian Government Gazette*. These gazettes should be consulted if any authorised legal version of the policy is required. The three documents are:

- No. S31, 16/5/1989, Gazette 15/6/1989. This is the SEPP N-1 policy, wholly replacing an earlier 1981 version of the policy
- a variation 15/9/1992, No. G37, Gazette 23/9/1992. This introduced an incorporated document, EPA publication 316a, for zone level calculations
- a variation 31/10/2001, No. S183, Gazette 31/10/2001. This introduced environment improvement plans and explicit requirements for planning decisions for consider the policy.

The three gazettes have been consolidated into a single document, providing a more accessible way to read the policy. The gazettes, the consolidated document and EPA publication 316a are available on the EPA website www.epa.vic.gov.au/noise

The following information explains the sections and clauses of SEPP N-1. It should be read alongside the consolidated document and/or gazettes.

Introductory clauses

Clauses 1-6 introduce the Policy, its structure and the Policy Goal.¹

SEPP N-1 is written to follow the requirements for SEPPs in Section 18 of the EP Act. SEPP N-1 is divided into 'parts'. An explanation of these parts is outlined in Table 1.

¹ Clause 1 defines how the Policy should be cited. Clauses 2 and 3 deal with the introduction of the Policy and are no longer relevant.

Table 1: Overview of SEPP N-1 structure

Part I – Boundaries of area affected	This defines the area where SEPP N-1 applies
Part II – Beneficial uses protected	All SEPPs define 'beneficial uses' of the environment. A 'beneficial use' means a use of the environment that requires protection. For example, sleep at night.
Part III – Premises of application	This means the types of noise-generating sites that SEPP N-1 applies to – industrial, commercial or trade premises.
Part IV – Environmental Quality Objectives and Indicators	'Environmental Quality Objectives' mean the standards (in this case, noise limits) that must be met to protect the 'beneficial uses'. 'Environmental Quality Indicators' define how the environment (the noise from industry) is measured to see if the Objectives are met. In SEPP N-1 the environmental quality indicator is the 'effective noise level'.
Part V – Attainment program	The environmental quality objectives of a SEPP must be met or 'attained' (for example, industry must not exceed the noise limits). The 'attainment program' sets out how this is done.
Part VI – Definitions	Defining relevant terms.
Schedule A – Measurement of noise	Defines how to measure noise to determine an 'effective noise level' from a site. This 'effective noise level' is the measure used to determine compliance with noise limits.
Schedule B – Determination of noise limits	Schedule B defines how the 'Environmental Quality Objectives' for Part IV (the noise limits) are determined.
Schedule C – Measurement of background levels	Measuring background levels is a necessary part of determining noise limits. This schedule defines how this is done.
Schedule D – Determination of derived noise limit	A procedure used occasionally as part of setting noise limits.

Clause 6 – Policy goal

Clause 6 describes the goal of SEPP N-1 to protect people from noise that may affect beneficial uses, while recognising the reality of the existing land-use structure in Melbourne.

SEPP N-1 recognises that there is a diversity of land-use situations in Melbourne, including wholly residential areas, mixed residential-commercial areas, and locations where residents live next to or within industrial or commercial precincts.

SEPP N-1 holds that different, reasonable expectations for industrial noise should apply in different areas and provides this by using land-use zoning as part of setting noise limits.

The Policy is also a planning tool, and new and proposed industries are required by the Policy to be designed so that the Policy noise limits are not exceeded.

Part I – Boundary of area affected

SEPP N-1 only applies within the Melbourne 'metropolitan region' as defined in 1988. This covers

much, but not all of the current greater Melbourne area. For example, parts of Pakenham, Belgrave, Mount Evelyn, Mount Eliza, Beveridge, and Lilydale are outside the SEPP N-1 area.

The SEPP N-1 area is shown in Figure 2. Further resources to help in determining whether premises fall within the SEPP N-1 area can be found at www.epa.vic.gov.au/noise or by calling the EPA Information Centre.

Part II – Beneficial uses protected

A 'beneficial use' means a use of the environment that requires protection. SEPP N-1 aims to protect people from the effects of noise impacting on 'normal domestic and recreational activities'. Sleep at night is included as an important beneficial use to be protected.

These 'beneficial uses' are protected in 'noise-sensitive areas.' Noise-sensitive areas are ones where people sleep or carry out other normal domestic activities. See SEPP N-1 Part IV for a full definition.

Part III – Premises of application

SEPP N-1 applies to noise from all commercial, industrial or trade premises within its area of application.

Certain types of noise are not covered by the Policy. They include music, firearms and construction noise.

The exclusions reflect the fact that some sources are not suited to assessment under the SEPP N-1 measurement method and/or should be managed by other means. It does not mean that those noise types do not risk causing unreasonable impacts or should be ignored by operators of industrial premises or regulators.

For more information on managing these kinds of issues, see NIRV Part 2, section 2.3 'Apply suitable controls for noise not addressed by the recommended levels'. This part of NIRV also discusses brief, high-noise emissions that are not well represented by the SEPP N-1 measurement method.

Part IV – Environmental Quality Objectives and Indicators

As described in Table 1, 'Environmental Quality Objectives' are the standards (in this case, noise limits) that must be met, to protect the 'beneficial uses'.

'Environmental Quality Indicators' define how the environment (the noise from industry) is measured to see if the Objectives are met.

Part IV 'calls up' the relevant schedules for measurement of noise and determination of noise limits as the methods for determining the objectives and indicators.

Part V – Attainment program

This part sets out the main objectives of the Policy.

Part V – General

The main objectives are:

- the measured noise level of the industry (effective noise level) must not exceed the noise limit in a noise-sensitive area (clause 13)
- the effective noise level for a derived point (an alternative measurement point) must not exceed the derived noise limit at a derived point (clause 14)
- where it is proposed to build new premises, the noise limit must not be exceeded upon completion (clause 16)

Prompt action is required to reduce noise levels where they exceed the maximum allowable noise limit.

Responding to compliance challenges (Part V, clause 17)

Sometimes it is not practical for a company to immediately reduce noise levels below the limits set in the Policy. The noise abatement equipment may take time to install, or may not be readily available. In these circumstances EPA can set a compliance date to take

such difficulties into account (clause 17). This approach may also be relevant to other authorities setting time frames for compliance (such as for a planning permit noise condition).

Under subclauses 17A-17G, there is an environment improvement plan (EIP) process for some existing premises that cannot practicably meet the limits. EIPs enable industry and affected residents to set a long-term plan for noise control. Compliance with the EIP achieves compliance with SEPP N-1.

To qualify for an EIP, the industry must have been operating in its current state before 31 October 2001 and there must be no practicable means currently available to allow the premises to comply. The EIP clauses were intended to apply to sites that were unable to comply with SEPP N-1 at that time. The intention of the EIP provisions was not to provide for non-compliance caused by land-use change or industry expansion since 31 October 2001. When the EIP provisions were introduced, SEPP N-1 was correspondingly modified to require future planning decisions to take account of the Policy – see notes on clause 19A below.

To take effect, the EIP must be given force by a notice issued by EPA.²

Obligations on planning and approval bodies (Part V, clause 16)

Prevention through design is an important part of avoiding noise issues. Clause 16 applies to planned industry premises and requires new proposals to be designed to meet the SEPP N-1 limits.

While this obligation directly applies to industry, government agencies such as planning authorities should ensure through their approval process that proposals will meet SEPP N-1. The degree of assessment needed may vary with the scale and risk of the proposal.

Clause 19A of SEPP N-1 further strengthens this obligation on planning and responsible authorities, with particular emphasis on land-use planning decisions and implementing planning schemes. This requirement is relevant to decisions for new industry uses and areas, as well as decisions to rezone land near industry to allow sensitive land uses. It is important for planning authorities to evaluate the potential impacts that can arise from allowing sensitive land-use encroachment, including loss of compliance for existing industry.³

Multiple premises making noise (Part V, clause 18)

The measured effective noise level includes the combined noise from all commercial, industrial or

² Note that SEPP N-1 EIPs are not the same tool as Neighbourhood EIPs in Division 1B, or EIPs in Section 31C of the EP Act.

³ These obligations are supported by clause 13.04 of the Victoria Planning Provisions, which state that planning must consider SEPP N-1 as relevant.

trade noise sources contributing at a measurement point.

Clause 18 of the SEPP N-1 attainment program confirms that, in order to achieve the SEPP N-1 noise limits, each of the contributing premises must reduce noise so that it is quieter than the SEPP N-1 noise limits. This is because noise from multiple premises will add together.

All industry noise at the measurement location will need to be considered. If the noise from an industry is loud enough to contribute to the effective noise level then it may require noise control. If the noise from an industry has a character to which an adjustment applies (see Schedule A) then it may also require noise control.

This requirement is relevant in inner-city locations, where there can be a number of noise sources to which a noise-sensitive area is exposed, such as air-conditioning systems on office or residential blocks. It is also relevant to locations near industrial estates.

Approval decisions also need to allow for noise from existing or anticipated future industry. For example, a proposed industry may need to be required to meet noise levels below the noise limits for the decision to be consistent with SEPP N-1, considering likely future growth of industry in the area.

Appendix F has guidance for approval bodies on how to apply this duty.

Choosing quieter equipment (Part V, Clause 19)

SEPP N-1 clause 19 advises industry on choosing low-noise equipment. See section 4 of this document for advice on how this clause should be applied.

Part VI – Definitions

The definitions specify the meanings of various words and terms used throughout the Policy.

The following points provide general advice on commonly queried definitions. See SEPP N-1 Part IV if more detail is required.

- The definition of commercial, industrial or trade premises covers all premises except for residential premises, roads or railway lines. This definition covers, for example, noise from a cool room on food premises, a school heating system, a factory, an office block or common plant at an apartment block.
- The background level (the natural quiet of the area, measured as part of determining noise limits) does not include intrusive noise from industrial premises.
- The definition for major premises refers to the *Environment Protection (Scheduled Premises and Exemptions) Regulations 1996*. This should be taken as a reference to the current (2008) version of the Regulations. Any scheduled premises in the

current Regulations are considered major premises.

- The day, evening and night periods are –

Day	0700–1800 Monday–Friday 0700–1300 Saturdays.
Evening	1800–2200 all days 1300–1800 Saturdays 0700–1800 Sundays and public holidays
Night	2200–0700

Schedule A – Measurement of noise

Schedule A of SEPP N-1 sets out the procedure to be followed to measure noise from major and minor premises.

The noise level of the industry (LA_{eq}) is measured at a point within the noise-sensitive area or, under special circumstances, at a derived point. The level is an energy average of the noise received at the measurement point. The level is then adjusted for additional factors that increase the annoyance of the noise, such as a tonal hum or hammering, the measurement position (which may need to account for reflection, for example), and how long the noise is heard during the measurement. After all adjustments have been made to the LA_{eq} the final level is called the effective noise level and is compared with the noise limit to determine compliance.

(a) Measurement

The noise of both major and minor premises (see Definitions above) is measured at a measurement point, normally in a noise-sensitive area where a maximum level will be obtained. The method of measurement will vary, but usually a recording will be taken for major premises and a (handheld) short, direct reading will be made for minor premises. A recording and file analysis must be made for major premises if the noise is tonal or impulsive.

(b) Tonal adjustment

A noise is more annoying when it has a tonal component (a perceptible hum or whine). An adjustment is made to allow for the additional annoyance caused by the tone.

Different procedures are used for major and minor premises.

Where the noise sounds tonal, the adjustment for major premises is determined from one-third octave analyses of the noise. This procedure requires a recording to be analysed using suitable analysis equipment. Adjustments of between one and seven decibels apply for most tonal noises.

The adjustment for minor premises is determined without recording and analysis equipment. The adjustment is based on a subjective assessment of the

noise when the level is being measured. Two different adjustments of two and five decibels are applied for a slightly tonal or a prominently tonal noise, respectively.

(c) Impulsive adjustment

A noise is more annoying when it has an impulsive component (such as rapid, repetitive banging). An adjustment is made to allow for the additional annoyance caused by the impulses.

Different procedures are used for major and minor premises.

For major premises the 'adjustment' is added during analysis of a recording of the impulsive noise by sampling with the time-weighting set to 'I' on the sound level meter. This typically raises the level by between one and six decibels.

The impulse adjustment for minor premises is determined in a similar way to the procedure for tones. It is based on a subjective assessment and an adjustment is made for noises that are 'slightly' (plus two decibels) or 'prominently' impulsive (plus five decibels).

(d) Duration adjustment

A noise that is not audible for significant periods of time is less annoying than a noise that is continuous. When the noise being measured is not audible in the noise-sensitive area for a full 30-minute period a negative adjustment is made. The same adjustment is made for both major and minor premises.

(e) Intermittency adjustment

A noise that changes in level rapidly is more annoying than a steady one. For example, a refrigeration plant cycling on and off, or a machine operating periodically in a factory, can cause serious disturbance, particularly to sleep. An intermittency adjustment of three or five decibels is made depending on the change in noise level and the time of day at which it occurs. The same adjustment is made for both major and minor premises.

(f) Indoor adjustment

Whenever possible, the noise measurement is taken out of doors as the Policy only sets limits for outside areas. The level of noise is reduced when it passes from the outside to the inside of a building. Therefore, an outside noise limit cannot be used inside a building. The Policy allows a microphone, attached to a boom, to be placed outside a window so an outdoor measurement can be taken when a noise-sensitive area is located in a multi-storey building.

Cases do arise when an indoor measurement cannot be avoided. This mainly occurs when windows are sealed or noise is transmitted into the room through a wall, floor or ceiling and there is no rear or front yard. For such cases, appropriate adjustments are specified

in the Policy that are added to the indoor measured level to give an equivalent outdoor LA_{eq} .

(g) Reflection adjustment

Hard surfaces, such as walls or fences, reflect noise back towards the microphone, which will combine with noise coming directly from the source, resulting in an artificially raised LA_{eq} . If the microphone is placed within one to two metres of an acoustically reflecting surface, an adjustment of -2 dB is made to the LA_{eq} for minor and major premises.

Schedule B – Determining noise limits

The maximum noise level allowed in a noise-sensitive area is called the noise limit. Schedule B sets out the procedure to be used to determine the noise limit. Once determined, this noise limit is the figure that the effective noise level (Schedule A) is compared to, to determine compliance.

The Policy's method for determining the noise limit takes into account the type of area in which the noise-sensitive area is located. This is expressed as the 'zoning level'.

The Policy's noise limits also take into account the amount of background sound in the area. This is expressed as the 'background level'.

These terms are explained below and the process is outlined in Figure 3.

(a) Zoning level

The first step in determining the noise limit is to calculate the 'zoning level'. This is determined from the proportion of industrial and commercial land use around the noise-sensitive area.

Under SEPP N-1's incorporated document, EPA publication 316a, different land-use zones are assigned a value (Type 1, 2 or 3) that corresponds to their relative 'intensity'. This 'intensity' reflects the purpose of the zone (for example, whether it encourages industrial uses) and the relative likelihood of noisy premises being established in that area. For example, a Residential 1 Zone is 'Type 1,' a Business 2 Zone is Type 2, and an Industrial 1 Zone is Type 3. The classification responds to the zone provisions themselves, not what uses exist in that area at a point in time.

The zoning level, based on this classification system for land-use intensity, is determined using planning zone maps. The steps involve:

- identifying the noise-sensitive area (for example, residential premises) and plotting this on a map
- 'drawing' two circles centred on the noise measurement point in the noise-sensitive area, one 140 m diameter, one 400 m diameter
- calculating the area of different land-use types (1, 2 or 3) within these circles

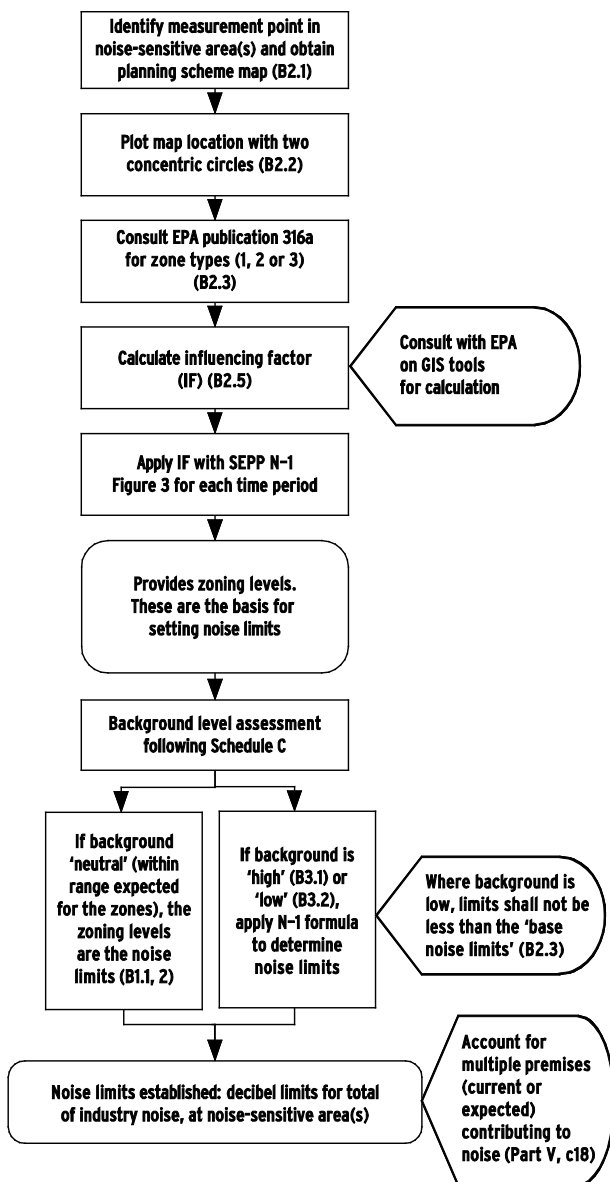


Figure 3: Overview of SEPP N-1 noise limit procedures.

- applying a formula that uses the proportions of land that are Type 1, 2 and 3 to determine an ‘influencing factor.’ This ‘influencing factor’ represents in a single figure the relative proportions of Type 1, 2 and 3 land in the area
- using the influencing factor in a formula to obtain the ‘zoning levels’ (for the day, evening and night periods) for that noise-sensitive area.

The zoning levels are higher where there is a higher proportion of Type 2 or 3 land near the noise-sensitive area.

An example of how the zoning level is determined is given in Appendix B, example 1 of these notes.

(b) Neutral background

After the zoning levels for day, evening and night have been determined, the background level (the ‘quiet’ of the area in absence of local noise such as industry noise) is measured.

This measurement is taken to assess whether:

- the background level is ‘neutral’ (not significantly higher or lower than the zoning level)
- the background level is ‘high’ or ‘low’ (significantly higher or lower than the zoning level).

If the background is neutral, the SEPP N-1 noise limit is the zoning level. This is because the background level has been shown to be typical of areas with this mix of land-use zones (see Appendix G, ‘Background to SEPP N-1 and NIRV’, for more information).

An example of how the noise limit is determined for neutral backgrounds is given in Appendix B, example 2 of these notes.

(c) Background level not neutral

If the background level is not neutral (in other words, it is high or low) then the noise limit is based on the background level.

SEPP N-1 provides formulas for calculating limits based on high or low background levels.

Where low background levels exist, the noise limit must not be less than the minimum levels specified in schedule B3.3 of the Policy.

Examples of the procedures to be followed for high and low backgrounds are given in Appendix B, examples 3 and 4 of these notes.

Schedule D – Determining derived noise limits

It is not always possible or appropriate to measure noise at a point inside a noise-sensitive area – for example, if the location is not accessible. Schedule A of the Policy allows a derived point to be used when it is difficult to measure noise within the noise-sensitive area.

If noise received within a noise-sensitive area comes from two or more industries and it is not possible to measure individually the amount of noise received from each of the industries, a derived point(s) may be specified so that the contribution from each industry can be measured.

Also, atmospheric effects, such as wind and inversion layers, can cause large variations to the received noise level if the noise-sensitive area is distant from the noise source. In such cases it is better to use an alternative site (a derived point) closer to the industry.

A maximum noise level is determined for the derived point (derived noise limit for that point) that will, when complied with, ensure that the noise limit within the noise-sensitive area is not exceeded.

The level of noise received at a site distant from a source (the noise-sensitive area) can be predicted using standard methods.

Schedule D sets out the procedure to determine the derived noise limit at a derived point. These methods take into account factors that can affect the received noise level such as distance, weather and barriers (hills and buildings). The derived noise limit is determined from the noise limit using a suitable prediction method.

3 EXPLANATION OF NIRV

Noise from industry in regional Victoria: Recommended maximum noise levels from commerce, industry and trade premises in regional Victoria (NIRV) is a non-statutory guideline published by the EPA. It provides recommended maximum noise levels ('recommended levels') for noise from industry.

NIRV's recommended levels do not have the force of law. Statutory instruments, such as a planning permit or notice, can be used to give legal effect to the recommended levels.

The following information helps to explain the sections of NIRV and how it is followed to establish recommended levels.

NIRV does not set out procedures for noise measurement, as the SEPP N-1 procedures are used. See the explanatory notes for SEPP N-1 Schedule A for more information on noise measurement.

Relevant documents

The relevant documents for using NIRV are:

- *Noise from Industry in Regional Victoria: Recommended maximum noise levels from commerce, industry and trade premises in regional Victoria* (publication 1411)
- *Applying NIRV to proposed and existing industry* (publication 1413 – 'the Applying NIRV guide').

Where NIRV directs that the SEPP N-1 method be used for setting recommended levels, SEPP N-1 and related material should also be consulted.

Note that, where NIRV uses the SEPP N-1 methods for either determining recommended levels or for noise measurement, this does not mean that SEPP N-1 has statutory effect.

Part 1 — Introduction

NIRV's introduction section describes:

- the purpose of the guidelines
- the different degrees of amenity protection provided in different land-use zones
- who should use NIRV (mainly government regulators and industry)

- the non-statutory status of NIRV and the role of the Applying NIRV guide
- what premises it applies to (the same premises as per SEPP N-1)
- the area it applies in (all locations outside the SEPP N-1 area)
- The noise types it does not apply to (such as voices, mobile farm machinery).

Considerations for amenity protection, sleep and land-use zoning

NIRV Part 1 states that the recommended levels promote normal domestic use of the home and sleep at night. It also highlights that the level of protection for residents will vary with land-use zoning.

NIRV draws attention to cases where residential areas are adjacent to heavy business or industrial zones. This is because, in limited cases, the NIRV zoning levels in NIRV Table 1 are higher than those most recently recommended by the World Health Organization - Europe to protect sleep⁴ (for example, where residential premises are adjacent to an Industrial 1 Zone).

The recommended levels in these situations place some expectation on residents living adjacent to industrial zones to take reasonable steps to promote sleep. Taking these steps (such as arranging bedrooms away from the industrial area) would provide a greater degree of acoustic attenuation than generally assumed under the WHO guidelines, and would therefore provide a suitable degree of sleep protection for the situation.

This outcome is similar to that under SEPP N-1, for industrial/residential interfaces in neutral background conditions.

The box on page 1 of NIRV recommends that regulators consult the Applying NIRV guide to consider land rezoning and noise issues. Section 5 of the Applying NIRV guide addresses the issues associated with adjacent residential and industry areas. It suggests using separation of land uses to avoid undesirable impacts from industry noise, as avoiding a direct interface between industrial and residential areas is the best way to prevent conflict.

Information on how regulators should apply NIRV

NIRV is not a statutory document and its recommended maximum noise levels are not mandatory. It is essential that regulators properly understand the implications of applying the levels in an approval or compliance decision. This is because other principles, such as for regulators to reasonably

⁴ WHO Night Noise Guidelines for Europe, 2009. These guidelines are not applicable outside of the European Region, but have been considered during development of NIRV. The guidelines recommend a night noise guideline target of 40 dB and an interim target of 55 dB (L_{night, outside}).

exercise their compliance powers, also need to be brought into decision-making.

Advice on these considerations is set out in the Applying NIRV guide. NIRV explicitly requires regulators to consult the guide, to ensure appropriate approval and compliance decisions.

Part 2 – Guidance for regulators

This part of NIRV is relevant to government regulators applying NIRV’s recommended levels. It addresses a range of considerations for applying the recommended levels. These explanatory notes provide further information on:

- considering the effects of noise on quiet rural areas
- managing noise from multiple sites.

Noise in quiet rural areas

The NIRV recommended levels are commonly applied in quiet rural settings. In these environments new industry noise sources may change the local sound environment. Part 2 emphasises that government regulators need to be aware of these changes. This section also clarifies the recommended levels do not protect some locations, such as parks and reserves, from industry noise intrusion.

While the recommended levels provide reasonable protection, they are not set to preserve the existing ambient sound environment, or attain inaudibility. Such outcomes would be in many cases unattainable for industry, or would otherwise be more stringent than necessary for reasonable protection of the ‘beneficial uses’ (see SEPP N-1 explanatory notes, Table 1 of these explanatory notes) of noise-sensitive areas.

The section ‘Where the recommended levels may not be appropriate’ provides for approving bodies to decide that the recommended levels are not an appropriate outcome in the context of a local area.

The emphasis of this section is specifically on protecting existing quiet because the values expressed in the planning scheme emphasise or imply this need (see description of these areas in NIRV). Its intent is not to protect all areas that are naturally quiet, nor is it to protect existing amenity solely on the basis of its value to nearby residents.

Decisions to either oppose a proposal or explore lower-noise design would be made by the approving body. If a lower-noise design is explored, NIRV provides for criteria based on ‘octave band’ levels (see Appendix A Glossary). These are expressed as a range (5-10 dB), as EPA anticipates that a proponent would engage the advice of an acoustic consultant to assess what noise control options and acoustic performance is achievable and feasible for the project.

The ‘octave band’ criteria control low-frequency noise from industry. This approach recognises that the

spread of sound over large distances in a rural environment can be enhanced by wind or temperature inversion, and that this can be a particular issue with the spread of low-frequency noise at great distances. The ‘octave band’ criteria can be employed to minimise this intrusion.

This approach is intended for limiting the degree of change and impact that a new use brings to an environment, particularly for long-distance propagation of sound. It is not presented as a control option for all premises with strong low-frequency noise content. SEPP N-1 and NIRV do not set specific controls for low-frequency noise (for example, for the ‘rumble’ of large boilers or from a power station). However, EPA suggests that, if a particular proposal presents a risk of intrusive low-frequency noise, specific design responses should be considered. This could include an ‘octave band’ based design, targeting the specific frequency bands with prominent low-frequency energy, or applying other standards developed for low-frequency noise.

Managing noise from multiple sites

The NIRV recommended levels are applied with a similar consideration for multiple noise sources as SEPP N-1 (see Section 2, Part V of this document). In the NIRV area, the design requirements for new industrial premises will depend on the likelihood of industrial development in an area.

Appendix F of this document has advice for regulators on how to apply their duty to consider noise from multiple premises as part of approval decisions.

Part 3 – Recommended maximum noise levels

Overview

Part 3’s procedures determine the recommended levels. Its key components are that:

- NIRV defines ‘major urban’ and ‘rural’ areas
- for all industry in major urban areas, NIRV adopts the SEPP N-1 methods to determine recommended levels
- outside major urban areas, NIRV has two approaches to setting recommended levels – 3.1, ‘General commerce, industry and trade’, and 3.2, ‘Earth resources’
- background levels, such as from traffic, will sometimes be factored into setting recommended levels.

Definitions for major urban and rural areas

Major urban areas are those considered to have similar background levels and land-use zoning to the SEPP N-1 area.

EPA’s decision on what constitutes a major urban area was based on an assessment of background noise levels and planning maps in various towns and cities.

EPA has adopted GIS (geographic information system) tools to provide a consistent, clear measure of the boundaries of towns and cities.

Taking reasonable opportunities to reduce noise

NIRV Part 3’s introduction states that industry should take reasonable opportunities to further reduce noise to below the recommended levels.

Section 4 of these explanatory notes provides further advice on reducing noise to below the recommended levels.

Part 3.1: Recommended maximum noise levels — general commerce, industry and trade

The approach to setting recommended levels depends on the nature of the area where the industry is located.

In major urban areas, the procedures in SEPP N-1 set the recommended levels for industry noise.

A different procedure is provided for rural areas. Background levels in rural areas are generally low to very low, resulting in almost uniformly low noise limits under the SEPP N-1 method, even in situations where the land is provided for industrial purposes.

EPA considered that this outcome would sometimes not be reasonable. If SEPP N-1 were applied, industrial facilities in a rural setting could be subject to lower noise limits than were necessary to provide reasonable protection for nearby residents.

For this reason, NIRV provides an alternative procedure to determine recommended levels. The process is guided by the local land-use zoning as described in the Victoria Planning Provisions (see NIRV Table 1).

NIRV’s principles are based on SEPP N-1, with adjustments in the methods to account for the lower background levels in rural areas, and the different land-use zoning relationships found in rural locations and smaller towns and cities.

The first step is to consult Table 1, which details zone levels. These are obtained from the planning zones of the noise-generating use and noise-receiving location.

- A noise-generating use is treated according to the intensity of development allowed and encouraged by the planning zone in which it falls. This determines which row it sits in on the table.
- A noise-receiving location is treated according to the planning zone in which it falls. The zone’s amenity values and provision for residential and other sensitive uses determine which column it sits in.

This allows a reasonable balance between the expected impacts of allowable uses and the amenity expectations of the receiving zones.

In step 2, the levels from Table 1 are adjusted to account for how far the noise receiver (for example, a

dwelling) is from the zone in which the noise generator is located. This adjustment reflects the higher amenity expectations of noise receivers at greater distance from industrial and commercial areas.

Step 3 provides a ‘floor’ to the distance-adjusted levels, to ensure that levels are not lower than necessary to provide reasonable protection for people.

Step 4 provides for the influence of background noise on how industry noise is perceived by people. While NIRV assumes low background levels in most rural situations, step 4 allows for cases where a major road or other source significantly affects background levels. This means that industry can be louder without necessarily being intrusive. Consistent with SEPP N-1, background levels under NIRV do not include other intrusive industry noise.

Step 5 provides constraints on how loud industry noise based on background levels may be. The step 5 reference levels provide a ‘cap’ to industry noise emissions, so that residents are not unduly impacted by high levels of industry noise.

Step 5 helps to manage the overall level of noise residents are exposed to by managing industry noise emissions relative to the level of traffic noise. The step 5 reference levels do not represent an assessment of what levels of traffic noise are appropriate, and are not targets for traffic noise management.

In addition to the step 5 procedures, EPA also recommends that, where a proposal is affected by noise from a major road, freeway or highway, and this road is expected to be moved or bypassed, the industry proposal should design for a lower noise level suitable to expected future background levels.

Part 3.1: Utilities variations

Part 3.1 also contains variations for utilities in rural areas.

The purpose for the first variation is to treat utilities in a road zone as though they were in the noise-receiving zone. This approach ensures that the recommended levels are more in line with the levels that the SEPP N-1 method would derive in similar situations.

The second variation reflects the fact that, in rural settings, people may have different expectations for noise from agricultural uses than for noise from utility installations, which are not connected to the local land resources in the way that agriculture is. The variation effectively treats the Farming Zone and similar zones as an agricultural area for the purpose of managing farming and rural industry noise, but as more akin to a rural living situation (resulting in lower recommended levels) for the purpose of managing utility noise.

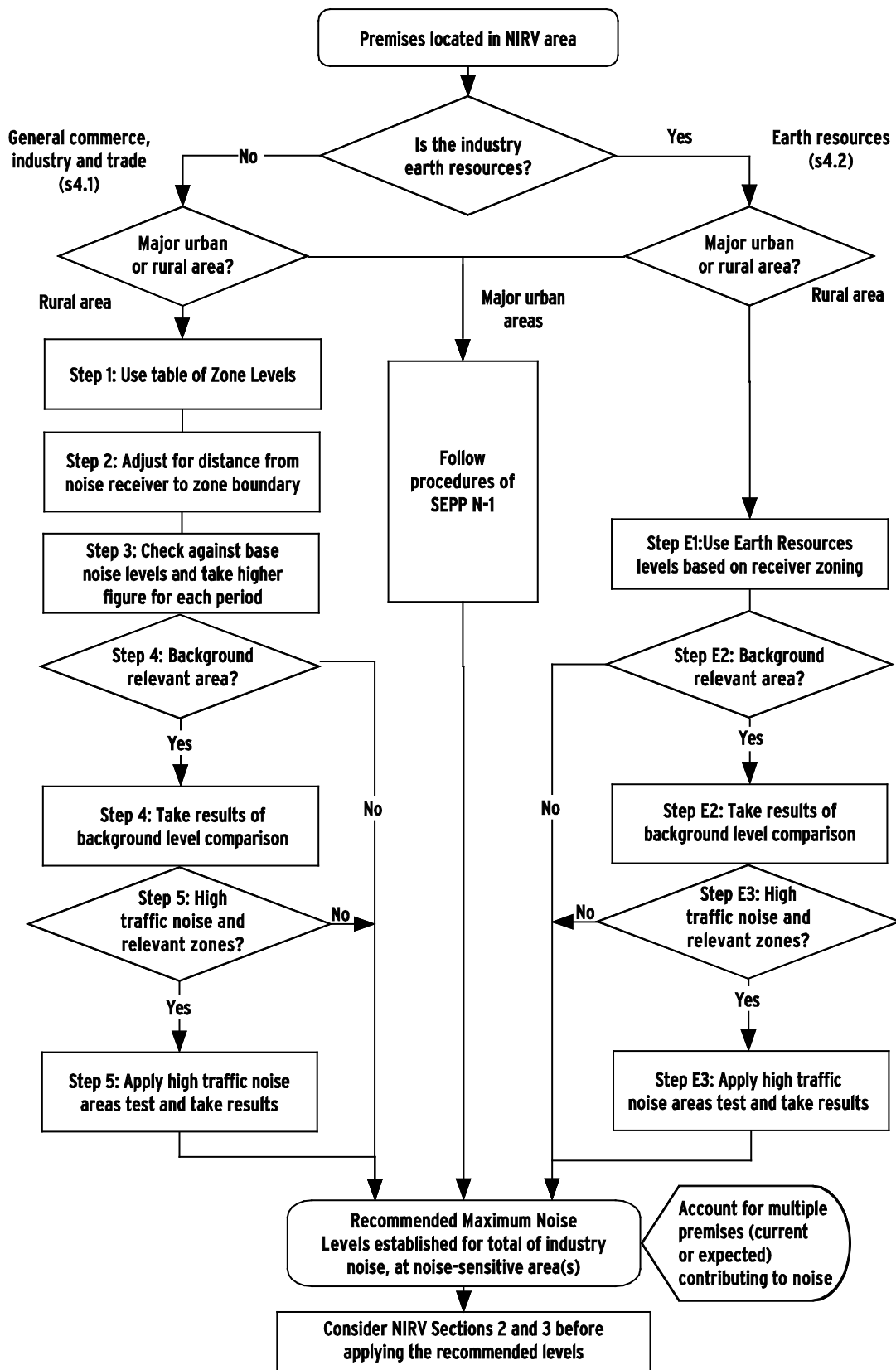


Figure 4: Overview of NIRV Part 4

Part 3.2: Recommended maximum noise levels – earth resources

The methods for determining earth resources recommended levels for are similar to those in section 3.1. The key difference is that the Table 1 zone levels and the distance adjustments are not applied.

Instead, four sets of recommended levels are provided. These respond to the different amenity expectations associated with differently zoned areas.

This ensures that earth resources will be treated similarly to other industry noise generators in an area, while avoiding the complexities associated with a detailed, planning-based approach. This approach recognises that mines and quarries are located according to the availability of a mineral or stone resource, rather than planning scheme provisions, and that therefore a graduated, planning scheme-based approach would not be appropriate.

As per section 3.1, the earth resources levels may be adjusted to account for background levels from traffic or other sources.

Part 4 – Variations to the recommended levels for mines, quarries and landfills

This section is provided to assist regulators in managing the higher levels of noise that can be associated with particular open-air activities at mines, quarries and landfills.

The variations recognise that some activities are unavoidably noisier than others. Provided these noisier activities are managed appropriately, including by managing the duration of the additional noise, further impacts can still be reasonable. The variations also help to balance the short-term additional impact associated with construction of noise-control works against the long-term noise-reduction benefits that they offer.

The variations are written to carefully manage any additional impact, with an emphasis on the duty of regulators to assess proposals and ensure that any variations are appropriately constrained.

4: BEST-PRACTICE NOISE-CONTROL MEASURES

The following advice is relevant to government agencies and industry. It expands on responsibilities under SEPP N-1 and NIRV that should be considered as part of government decision making and industry noise management.

The SEPP N-1 noise limits and NIRV recommended levels (limits and levels) represent a balance between protecting residential amenity and industrial operations. Achieving the limits and levels will not remove all impact on human beings.

People vary widely in their sensitivity to noise and some will be strongly impacted at low levels. Accordingly, industry premises should employ best-practice measures to minimise noise.

Best practice means the best combination of techniques, methods, processes or technology used in an industry sector or activity that demonstrably minimises the environmental impact of that industry sector or activity.

The following sections explain best-practice principles in the context of SEPP N-1 and NIRV obligations.

Obligations under SEPP N-1 and NIRV

The following obligations apply independently of obligations to meet the limits and levels. They relate to taking steps to reduce noise to below the limits and levels.

SEPP N-1 clause 19 advises 'that, where equipment is to be replaced or new equipment installed, the quietest equipment available should be used where a significant reduction in noise in noise-sensitive areas can be expected to occur'.

NIRV Part 3 restates this obligation. It also advises that industry should apply routine noise-control measures where these will have a demonstrable reduction in noise at sensitive areas.

SEPP N-1 and NIRV refer to noise-control measures that:

- have a significant or demonstrable reduction in noise – any reduction should be measurable, or otherwise detectable (for example, removing an annoying tonal character)
- reduce noise at noise-sensitive areas – the benefits of reducing noise are considered for the noise receiver (such as residential premises), not at the noise source or within the industrial area.

The cost of noise control measures should also be proportional to the benefit or environmental improvement they offer.

Implementing noise controls

The following is a general guide to applying SEPP N-1 and NIRV obligations. It sets out expectations for different types and scales of business.

Commonplace premises and small businesses — apply routine noise controls and manage activities

This advice is relevant to small-to-medium enterprises, retail food premises, shops and other commonplace premises.

Business should take opportunities to reduce noise during development proposals (such as planning permit applications) or replacement of equipment, or in response to community concern.

Industry should consider potentially intrusive noise sources. These can include:

- elevated noise sources (including stack discharges, fans, outlets and others)
- equipment operating at night
- activities occurring at night
- proposed equipment or sites with adjacent or visible residential neighbours.

After identifying current or potential noise sources or noisy activities, industry should:

- employ routine noise controls where these will have a demonstrable reduction in noise reaching sensitive areas
- apply all practicable noise-management measures, including time restrictions, management of activities such as deliveries and use of lower-noise movement alarm systems (for example, broadband reversing beepers).

Routine noise control means measures that are readily available to control particular noise sources, such as enclosures supplied for noisy items (like pumps), discharge attenuators or mufflers on stack discharges, acoustic louvres on plant-room air intakes/discharges, acoustic fences, and location of noise sources away from sensitive areas.

Sometimes simple works can achieve marked results without a great deal of expense. For example, if the noise is due to a small number of exhaust air fans, then off-the-shelf silencers can resolve the problem without significant expense.

Routine noise control usually carries a cost, although extra costs may be minimal if taken as part of initial planning and purchases.

Even where premises or works do not require statutory approval, or require approval but would meet the limits/levels without acoustic treatment, routine noise control should still be used to minimise noise impacts.

Note that, while applying routine noise controls can reduce the risk of impact or bring the noise below the

limits/levels, it does not replace proper acoustic assessment where this is required.

EPA encourages industry to routinely apply readily available noise controls. If a business needs to assess the effectiveness of these controls, it can consult equipment and acoustic product suppliers.

Larger businesses, premises with multiple noise sources and more complex noise control

This advice relates to sites with multiple noise sources such as industrial facilities, and companies with corporate environmental management procedures.

The advice for smaller premises above also applies to these premises. In addition, they should consider noise as part of their site performance reviews, as a way to meet their environmental goals.

If there is an opportunity to further reduce noise (and routine noise control and management measures have already been implemented), the business should:

- assess all available noise-control techniques, methods, processes or technology
- implement measures that will lead to a significant reduction in noise in sensitive areas.

The cost of noise-control measures should also be proportional to the environmental improvement they offer. Advice from acoustic engineers or consultants may assist in making these decisions.

Other factors such as the relative noise contribution of other local industry, future site expansion potential and land-use changes in the area also need to be considered.

APPENDIX A: GLOSSARY OF TERMS

A complete glossary of acoustic terms has been published by Standards Australia as Australian Standard 1055.1-1997 and should be referred to for precise definitions. The following is a glossary of some acoustic terms that appear in SEPP N-1 and NIRV.

These terms give simple explanations that reflect the way terms are used in SEPP N-1 and NIRV, and do not replace their meaning.

Sections 2 and 3 of these explanatory notes should be consulted for other terms such as 'effective noise level,' 'environmental quality indicator', 'environmental quality objectives', 'environment improvement plan' and 'major premises'.

Table A1: Acoustic terms

Term	Explanation
(A)-weighting	A response provided by an electronic circuit that modifies sound in such a way that the resulting level is similar to that perceived by the human ear.
Decibel (dB)	The unit of measure for sound intensity. A logarithmic scale unit used in the comparison of sound pressures. Zero decibels is the limit of hearing.
Equivalent continuous sound level (LA _{eq})	A value that takes into account all variations in noise level. (For a steady sound with small fluctuations, its value is close to the average sound pressure level.) An adjusted LA _{eq} measurement is used to determine the effective noise level in SEPP N-1.
Hertz (Hz)	The unit of measure for the frequency of sound. It is the number of pressure peaks per second passing a point when a pure tone is present.
LA90 level (used for 'background level')	An (A)-weighted sound measurement value that is a measure of the lower levels of the varying sound level. In SEPP N-1 it is used to measure background noise (see SEPP N-1 definitions, background level).
Metropolitan region	This is the SEPP N-1 area of application, as defined in SEPP N-1. It covers much of, but not all of the current greater Melbourne area. See Figure 2.
Noise-sensitive area	The SEPP N-1 noise limits and NIRV recommended levels are set at noise-sensitive areas. These are mainly homes, but can include, for example, motels and tourist establishments. They do not include schools. The noise is assessed at outdoor locations at these premises. For definition, see SEPP N-1.
Octave-band levels	The pitch or frequency of sound can be divided into octave bands for the purposes of design and assessment. Each octave band represents a frequency range, from low to high. A design based on octave-band criteria enables more targeted control of low-frequency noise.
Regulators	Refers to a range of government regulatory bodies that issue statutory approvals or have compliance powers relating to the environment, such as planning authorities, EPA, or the Department of Primary Industries.

APPENDIX B: SEPP N-1 EXAMPLES OF APPLICATION

Example 1: Procedure for determining the zoning level.

Figure 5 shows a map of an area containing land zoned as residential, business, industry and public use, main road and parkland, according to the local planning scheme. The map shows two concentric circles. The outer circle's diameter is 400 metres and the smaller circle's diameter is 140 metres. Both are centred on the measurement point, which is within a residential allotment (a noise-sensitive area).

The different areas zoned on the map according to the planning scheme are categorised as type 1, type 2 or type 3, according to EPA publication 316a, *Designation of types of zones and reservations in the metropolitan region planning schemes for the purposes of State Environment Protection Policy (Control of Noise from Commerce, Industry and Trade) No. N-1*. The total area for each circle and the area of each type is determined for both the 140 metre and 400 metre circles using a GIS tool. Other methods of area measurement, such as a planimeter, may be used or the fraction of each circle occupied by type 2 and 3 zones and reservations may be used. The influencing factor is not highly sensitive to errors in measurement.

The relevant areas of the inner circle and outer circle are as follows:

	Inner circle (140 metre diameter)	Outer circle (400 metre diameter)
Area of type 1	8699.4	63930.4
Area of type 2	5570.0	47287.9
Area of type 3	1095.3	14362.8
Total area	15364.7	125581

The influencing factor (IF) is calculated as follows:

$$IF = \frac{1}{2} \left(\frac{(\text{Area Type 3}) + \frac{1}{2} (\text{Area Type 2})}{\text{Total area of Circle}} \right) \text{ of 140 metre diameter circle} + \frac{1}{2} \left(\frac{(\text{Area Type 3}) + \frac{1}{2} (\text{Area Type 2})}{\text{Total area of Circle}} \right) \text{ of 400 metre diameter circle}$$

$$IF = \frac{1}{2} \left(\frac{(1095.3 + \frac{1}{2} \times 5570.0)}{15364.7} \right) + \frac{1}{2} \left(\frac{(14362.8 + \frac{1}{2} \times 47287.9)}{125581.1} \right)$$

$$IF = 0.28$$

The influencing factor is used to determine the zoning level from Figure 3 of the Policy. The zoning levels for an influencing factor of 0.28 are as follows:

Day period (0700-1800 hours)	55 dB(A)
Evening period (1800-2200 hours)	49 dB(A)
Saturday (1300-1800 hours)	49 dB(A)
Sunday (0700-1800 hours)	49 dB(A)
Night period (2200-0700 hours)	44 dB(A)

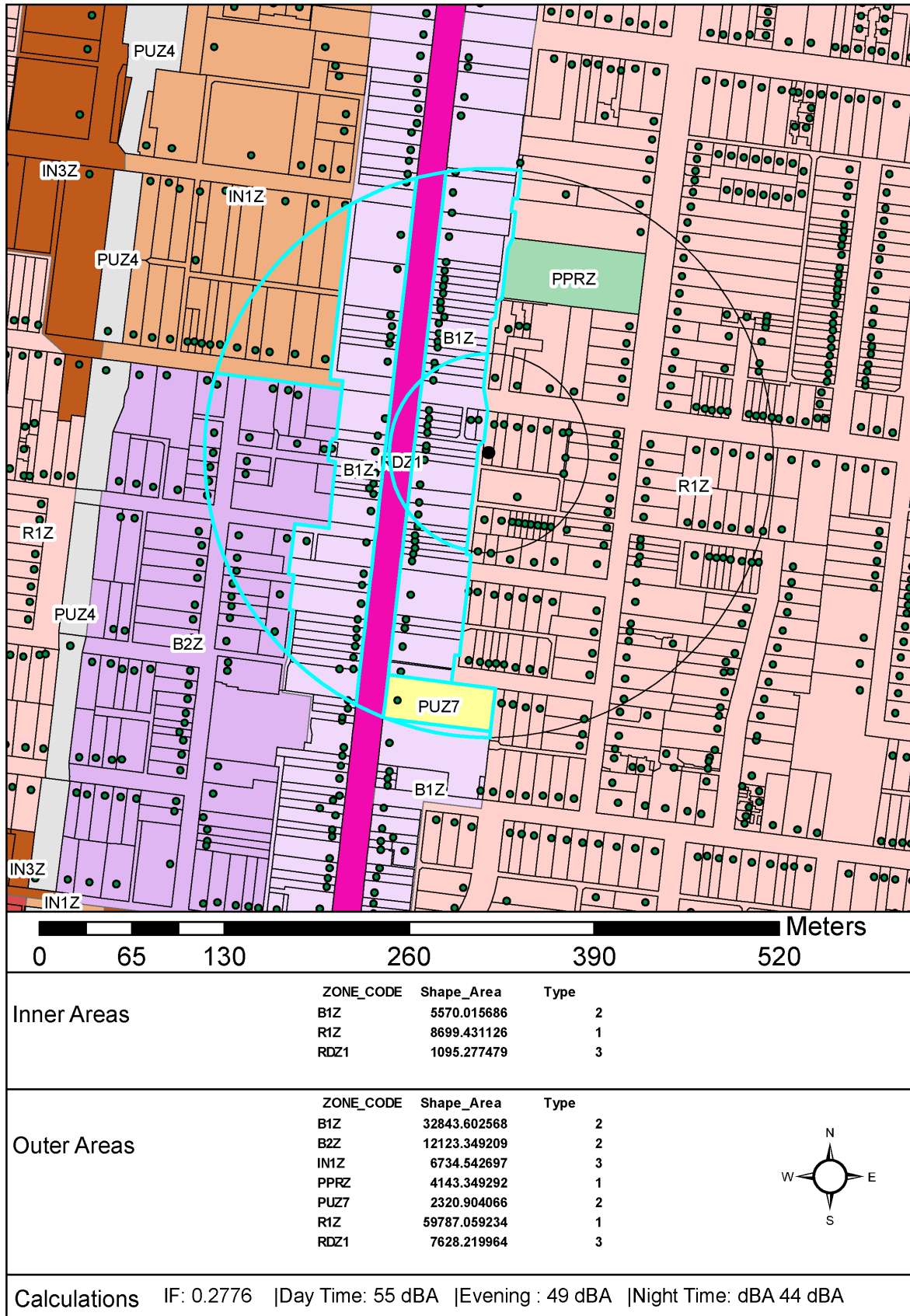


Figure 5: zone circles to be inserted

Example 2: Neutral background level procedure

In this example the background levels for the area were measured according to Schedule C2 of the Policy and compared with the zoning levels.

The Policy specifies that the background level is neutral when it is at least 6 dB, and no more than 12 dB, below the zoning level for the day period. For other periods it is neutral when at least three dB, and no more than 9 dB, below the zoning level. In this example the background level is neutral and the noise limit is the zoning level.

The following results were obtained:

	Zoning levels	Background levels	Noise limits
Day period	55 dB(A)	44 dB(A)	55 dB(A)
Evening period	49 dB(A)	41 dB(A)	49 dB(A)
Saturday (1300-1800)	49 dB(A)	44 dB(A)	49 dB(A)
Sunday (0700-1800)	49 dB(A)	40 dB(A)	49 dB(A)
Night period	44 dB(A)	36 dB(A)	44 dB(A)

Example 3: High background level procedure

In the previous example the noise limit was calculated for a measurement point in a noise-sensitive area where the background level was neutral. If the background level for the noise-sensitive area shown in Figure 5 is not neutral then the noise limit is determined from section B3 of the Policy.

- When the day period background level plus 6 exceeds the zoning level, the noise limit is the background level plus 6 dB(A).
- When the evening or night period the background level plus 3 exceeds the zoning level, the noise limit is the background level plus 3 dB(A).

In this example the background level was measured according to Schedule C2 of the Policy and found not to be neutral. The background level was then measured according to Schedule C3 and found to be high.

The background levels and zoning levels for the measurement point shown in Figure 5 were as follows:

	Zoning levels	Background levels
Day period	55 dB(A)	53 dB(A)
Evening period	49 dB(A)	49 dB(A)
Saturday (1300-1800)	49 dB(A)	50 dB(A)
Sunday (0700-1800)	49 dB(A)	47 dB(A)
Night period	44 dB(A)	43 dB(A)

According to the Policy the background levels in this example are high. Therefore, the noise limits for the measurement point are based on the background level plus adjustments for the day, evening and night periods. The background levels, adjustments and noise limits were:

	Background level	Adjustment	Noise limit
Day period	53 dB(A)	+ 6 dB	59 dB(A)
Evening period	49 dB(A)	+ 3 dB	52 dB(A)
Saturday (1300-1800)	50 dB(A)	+ 3 dB	53 dB(A)
Sunday (0700-1800)	47 dB(A)	+ 3 dB	50 dB(A)
Night period	43 dB(A)	+ 3 dB	46 dB(A)



Example 4: Low background level procedure

The Policy states that the background is low when the zoning level is 13 dB or more above the background level for the day period and 10 dB or more for the evening and night periods.

In this example the background level was found not to be neutral. The following results were obtained when the background levels were measured according to Schedule C3 and the zoning levels calculated:

	Zoning level	Background level
Day period	55 dB(A)	41 dB(A)
Evening period	49 dB(A)	40 dB(A)
Saturday (1300-1800)	49 dB(A)	41 dB(A)
Sunday (0700-1800)	49 dB(A)	35 dB(A)
Night period	44 dB(A)	30 dB(A)

According to the Policy the background level for the day and night periods and Sunday (0700-1800 hours) are low. The noise limits are calculated according to Schedule B3.2 of the Policy as follows.

Day period

The following equation is used to calculate the noise limit for the day period:

$$\begin{aligned}
 \text{Noise limit} &= \frac{1}{2} (\text{zoning level} + \text{background level}) + 4.5 \text{ dB(A)} \\
 &= \frac{1}{2} (55 + 41) + 4.5 \text{ dB(A)} \\
 &= 53 \text{ dB(A)} \text{ (rounded to nearest decibel, see clause B1.5)}
 \end{aligned}$$

Evening period

The background levels for the evening period and Saturday afternoon are not low. The noise limits for these periods are therefore the zoning level.

$$\begin{aligned}
 \text{Evening period, Noise limit} &= 49 \text{ dB(A)} \\
 \text{Saturday (1300-1800), noise limit} &= 49 \text{ dB(A)}
 \end{aligned}$$

The noise limit for Sunday (0700-1800hours) is calculated as follows:

$$\begin{aligned}
 \text{Noise limit} &= \frac{1}{2} (\text{zoning level} + \text{background level}) + 3 \text{ dB(A)} \\
 \text{Sunday (0700-1800), noise limit} &= \frac{1}{2} (49 + 35) + 3 \text{ dB(A)} \\
 &= 45 \text{ dB(A)}
 \end{aligned}$$

Night period

The noise limit for the night period is calculated as follows:

$$\begin{aligned}
 \text{Noise limit} &= \frac{1}{2} (\text{zoning level} + \text{background level}) + 3 \text{ dB(A)} \\
 \text{Night period, Noise limit} &= \frac{1}{2} (44 + 30) + 3 \text{ dB(A)} \\
 &= 40 \text{ dB(A)}
 \end{aligned}$$



APPENDIX C: TYPICAL NOISE LIMITS UNDER SEPP N-1

Below are examples of typical SEPP N-1 noise limits for various types of land uses.

Description of area	Typical noise limit dB(A)		
	Day* 0700-1800 hours	Evening 1800-2200 hours	Night 2200-0700 hours
Mainly residential area	50-54	44-48	39-43
Area with some commerce or industry	54-59	48-52	43-47
Commercial district or bordering an industrial area	59-63	52-57	47-52
Predominantly industrial area	63-68	57-61	52-56

* The evening noise limit applies on:

- Saturdays between 1300 and 1800 hours
- Sundays and public holidays between 0700 and 1800 hours.

Below are the SEPP N-1 'base noise limits'. These are the lowest limits that SEPP N-1 can apply. They can be a useful conservative reference for assessing noise in very quiet locations (such as rural land within the SEPP N-1 area or a major urban area) where there is no nearby industrial or commercial land.

These are provided as a reference to assist some investigations or to help industry avoid the need for background noise assessments when resolving issues. However, if a formal investigation or compliance action is required in the SEPP N-1 area or a NIRV major urban area, the procedures in SEPP N-1 for background noise measurement and setting noise limits must be followed.

	Typical noise limit dB(A)		
	Day* 0700-1800	Evening 1800-2200	Night 2200-0700
Base noise limits	45	40	35

* The evening noise limit applies on:

- Saturdays between 1300 and 1800 hours
- Sundays and public holidays between 0700 and 1800 hours

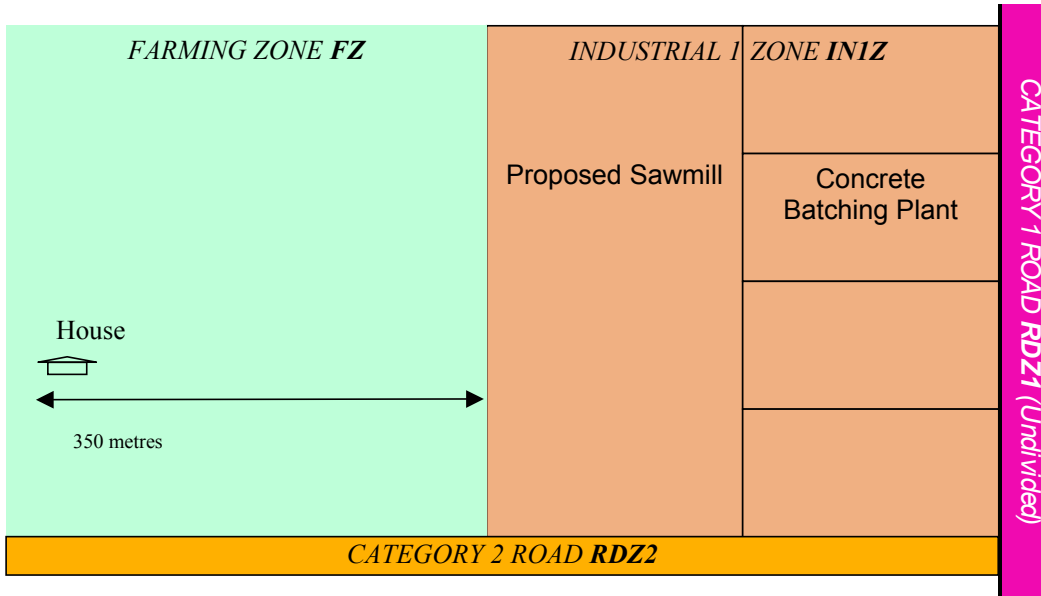
APPENDIX D: NIRV EXAMPLES OF APPLICATION

This appendix provides examples for using NIRV.

Example 1

A concrete batching plant in an Industrial 1 Zone (IN1Z) of a town with a population of 5000 produces noise that impinges on a dwelling in a large allotment in a Farming Zone abutting the industrial zone.

A sawmill is proposed on another industrial block in the IN1Z. Other blocks in the IN1Z are at present unoccupied or not significant noise contributors. NIRV Part 3.1 is applied.



- In this example the recommended maximum noise levels are based on the criteria for a rural area, being a town under 7000 in population.
- **STEP 1.** The generating zone is Industrial 1 and the receiving zone is Farming. The zone levels from Table 1 are Day 53 dB(A), Evening 48 dB(A) and Night 43 dB(A) (from Row 6, Column 3).
- **STEP 2.** The receiver distance (350 metres) is greater than 300 metres but less than 400 metres, so the distance adjustment to the zone level is -3 dB.
- **STEP 3.** The distance-adjusted levels are above the base noise levels specified in Step 3 and therefore the distance-adjusted level is adopted at Step 3.
- **STEP 4.** A background level assessment is not required because the receiving point is less than 600 metres from the generating zone boundary and not in a location where the background level is unusually elevated. Therefore, the levels at the end of Step 3 are the recommended levels.

The recommended maximum noise levels at the house in the farming zone are –

Day:	Monday-Friday (0700–1800), Saturday (0700-1300)	50 dB(A)
	Saturday (1300-1800)	45 dB(A)
	Sunday and Public Holidays (0700-1800)	45 dB(A)
Evening:	Monday-Sunday (1800-2200)	45 dB(A)
Night:	Monday-Sunday (2200-0700)	40 dB(A)

These levels apply to the total noise from commercial, industrial or trade noise sources at the assessment point. With other potential industrial noise contributors within the same zone, occupants of premises need to design or reduce noise to below the recommended level.

STEP 5. As a background level assessment is not required, the provisions for high traffic noise areas do not apply.

- Section 3 provides relevant recommendations about multiple noise contributors. The council can, through the planning process, request the applicant from the sawmill to address its noise contribution in light of the other existing and potential industry.

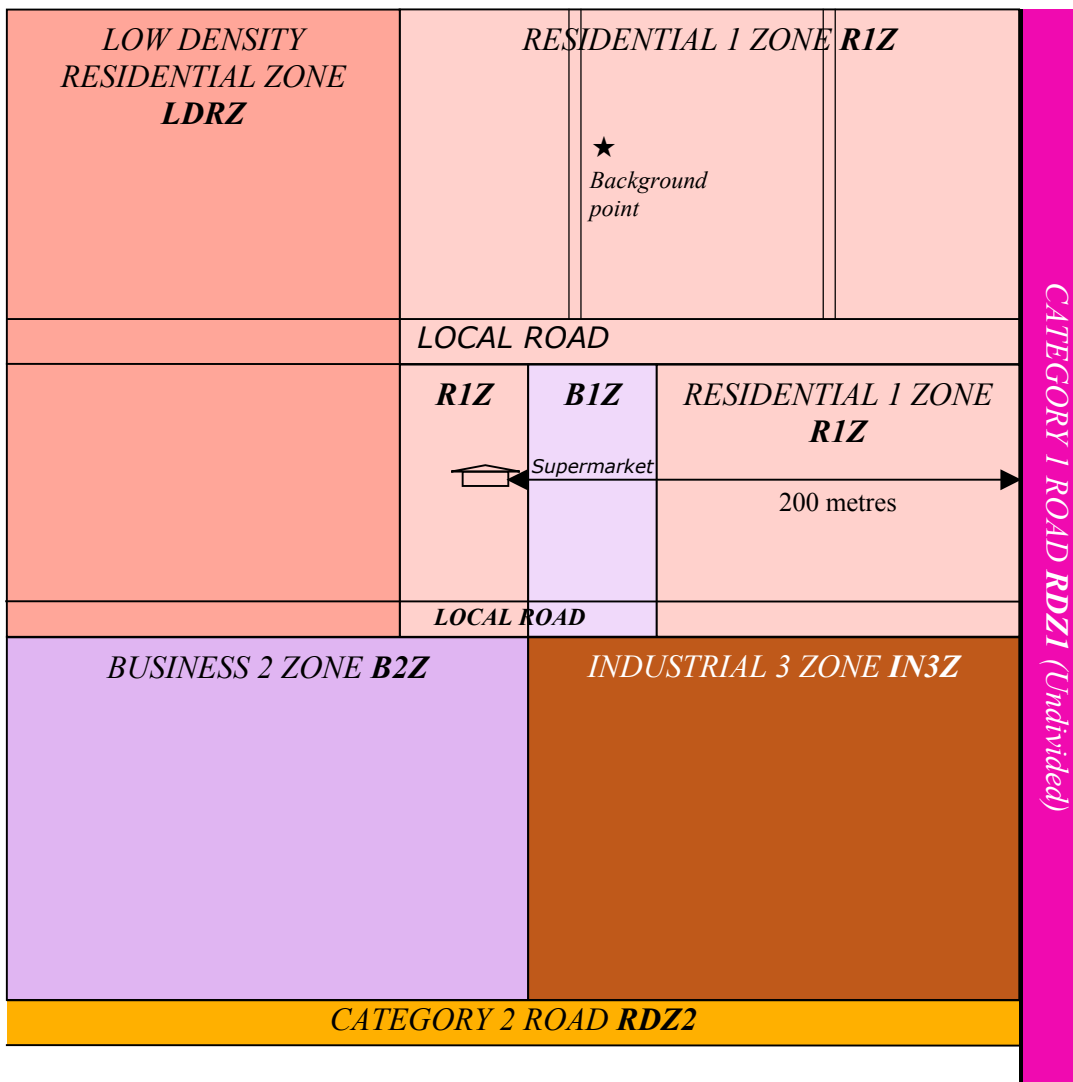
In this case the applicant and council agree that, as a new entrant into the industrial zone, the new operation should design noise emissions at the recommended maximum noise level minus three decibels (47 dB(A) for the day period). This approach will help to contain 'noise creep' due to development growth. The sawmill operates in the daytime only, except for a wood kiln with exhaust fans. As future night-operating industrial premises might occupy other allotments in the zone, council seeks to ensure new developments are compatible with the ultimate development of the industrial zone. Council asks the applicant to demonstrate that night-time noise from the wood kiln will meet the Night recommended level minus 3 decibels. A reduction applies to the evening period as well, but the design for the night period is the critical one for compliance.

- The noise design targets become:

Day:	Monday-Friday (0700-1800), Saturday (0700-1300)	47 dB(A)
	Saturday (1300-1800)	42 dB(A)
	Sunday and public holidays (0700-1800)	42 dB(A)
Evening:	Monday-Sunday (1800-2200)	42 dB(A)
Night:	Monday-Sunday (2200-0700)	37 dB(A)

Example 2

A supermarket refrigeration unit causes noise that affects a house on an adjacent residential zone in a city of population 6000. The monitoring point is 200 metres from a main road and traffic noise is a feature of the local acoustic environment. The receiving zone is adjacent to a developed Business 2 zone and the supermarket's Business 1 zone is adjacent to an undeveloped Industrial 3 zone.



Determining the recommended maximum noise level requires considering the generating and receiving zones, and considering background levels because of the presence of traffic noise from the main road.

The steps for a rural area apply (NIRV Part 3.1), as the area is within a city of 6000 population. The city would have to have a population of 7000 or greater to use the SEPP N-1 method to determine the recommended maximum noise levels.

- **STEP 1.** The generating zone is a Business 1 zone and the receiving zone is a Residential 1 zone. The zone levels (from Table 1) are Day 48 dB(A), Evening 43 dB(A) and Night 38 dB(A).
- **STEP 2.** The distance between the receiver and the generator's zone boundary is less than 100 metres, so the distance-adjustment is zero under Step 2.
- **STEP 3.** The levels are greater than the base noise levels in Step 3. Take the distance-adjusted levels to Step 4.
- **STEP 4.** The receiving point is in a background-relevant area, as traffic is a significant audible background noise source. The background level is measured using the procedures specified in SEPP N-1. To avoid including industrial noise sources (the refrigeration unit) – which are not background sound sources – the background levels were measured at another site with equivalent background level exposure, as marked on the diagram.

The measured representative background levels were:

Day:	Monday-Friday (0700–1800), Saturday (0700–1300)	41 dB(A)
	Saturday (1300–1800)	41 dB(A)
	Sunday and public holidays (0700–1800)	39 dB(A)
Evening:	Monday-Sunday (1800–2200)	38 dB(A)
Night:	Monday-Sunday (2200–0700)	30 dB(A)

The background levels are compared to the levels from Step 3 for each period, to see whether it will increase the recommended levels. The recommended maximum noise level becomes the greater of the distance-adjusted level or the base noise level and the background level, plus a margin as specified in Step 4.

The recommended maximum noise levels are:

Day:	Monday-Friday (0700-18:00 hours), Saturday (0700-13:00)	49 dB(A)†
	Saturday (1300-1800)	46 dB(A)†
	Sunday and public holidays (0700-1800)	44 dB(A)
Evening:	Monday-Sunday (1800-2200)	43 dB(A)
Night:	Monday-Sunday (2200-0700)	38 dB(A)

† In this example the noise levels at the affected house are adjusted because of background influences. This is only for the weekday day period and Saturday afternoon.

For day period Monday-Friday –

Background of 41 dB(A) +8 is 49. This is greater than 48 dB(A) level from Step 3, so the recommended level is 49 dB(A).

For Saturday afternoon –

Background of 41 dB(A) +5 is 46. This is greater than 43 dB(A) level from Step 3, so the recommended level is 46 dB(A). Note that Saturday afternoon (1300–1800 hours) and daytime (700–1800 hours) on Sunday and public holidays are treated as for the evening period.

For the night period –

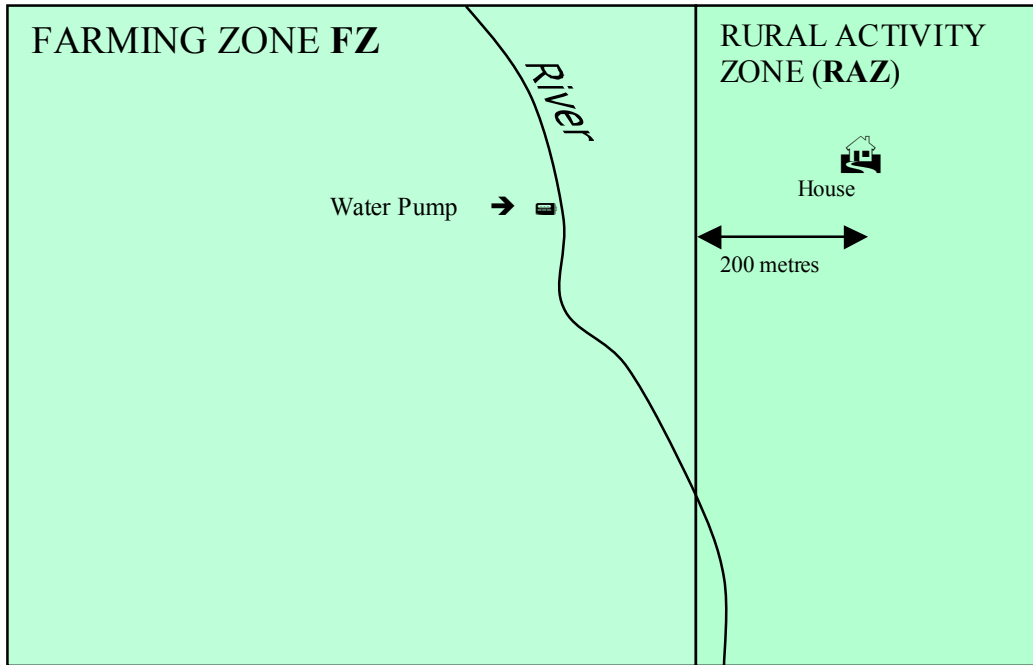
Background of 30 dB(A) + 5 is 35. This is less than the 38 dB(A) level from Step 3, so the recommended level is 38 dB(A).

As the supermarket refrigeration unit operates continuously during the day, evening and night periods, the crucial time is the night period. Checking of background influence may only be needed during this period.

- **STEP 5.** As the supermarket is an existing industry, Step 5 does not apply.

Example 3

A water pump is used to irrigate a market garden on a Farming zone outside the Metropolitan Region, producing noise detectable at a dwelling on an abutting Rural Activity Zone. The pump is normally only operated during the daytime but may operate at night during summer.



- The location is remote from any town or city, so the rural area provisions apply.
- **STEP 1.** The zone levels are taken from Row 2, Column 3 of Table 1: Day 46 dB(A), Evening 41 dB(A), Night 36 dB(A). The first footnote to Table 1 has special provisions relating to the Farming zone. In this case the land is used as a market garden. The agricultural activity is a more intensive one and on smaller allotments than broad-acre farming. It falls within the definition in the planning scheme of 'Horticulture' and the footnote suggests a +3 dB adjustment to the zone level. The final zone levels are then Day 49 dB(A), Evening 44 dB(A), Night 39 dB(A).
- **STEP 2.** The house is in the Rural Activity Zone, 200 metres from the boundary of the Farming zone, so the distance adjustment is -2 dB. The distance-adjusted levels are Day 47dB(A), Evening 42 dB(A), Night 37 dB(A).
- **STEP 3.** The distance-adjusted levels are greater than the base noise levels in Step 3. Take the distance-adjusted levels to Step 4.
- **STEP 4.** There are no main roads, highways or freeways nearby and traffic noise is not a characteristic of the local acoustic environment. The receiver is within 600 m of the zone boundary and not within any other elevated-background area, so the location is not a background-relevant area. There is no need to conduct a background level assessment.

The recommended maximum noise levels outdoors at the house in the Rural Activity Zone become:

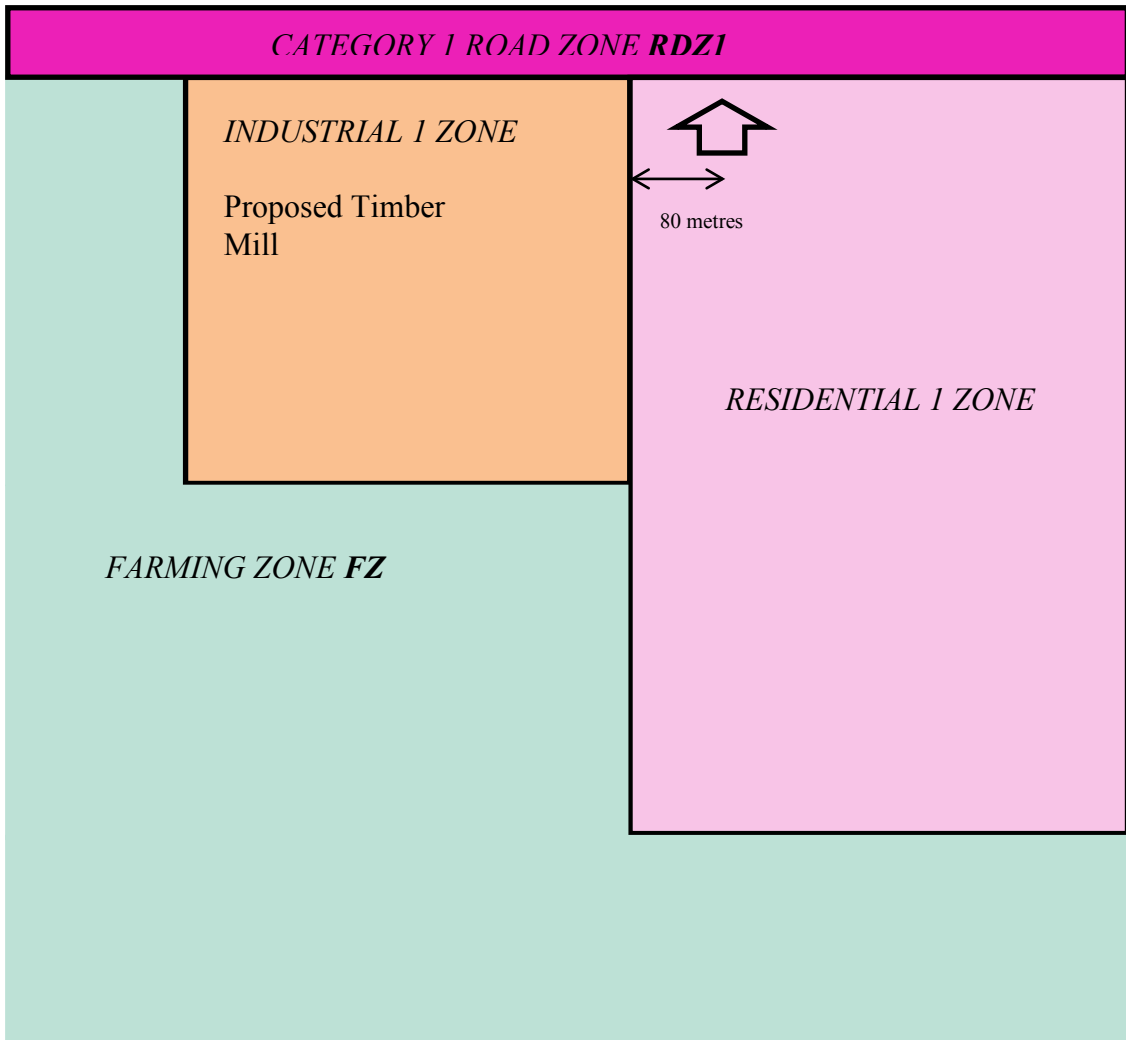
Day:	Monday-Friday (0700–1800), Saturday (0700–1300)	47 dB(A)
	Saturday (1300–1800)	42 dB(A)
	Sunday and public holidays (0700–1800)	42 dB(A)
Evening:	Monday-Sunday (1800–2200)	42 dB(A)
Night:	Monday-Sunday (2200–0700)	37 dB(A)

Other noise from the farming area includes vehicle activity harvesting crops and tractor operations involved in ploughing and spraying. This operation of 'mobile farm machinery' is not included in the assessment against the recommended level (see section 1).

- **STEP 5.** As a background level assessment is not required, the provisions for high traffic noise areas do not apply.

Example 4

A new timber mill is proposed in an industrial zone on in a small town of population 2700. It is intended to operate 24 hours a day Monday to Friday. The noisier debarking operations are proposed for the day period only. The other activities will operate 24 hours. There are no other industries in the industrial zone. The industrial area and adjoining residential zone (the receiving zone) are located next to a busy highway.



Determining the recommended maximum noise level requires considering the generating and receiving zones, and considering background levels because of the presence of traffic noise from the highway.

- The steps for a rural area apply, as the area is within a town of 2700 population.
- **STEP 1.** The generating zone is an Industrial 1 zone and the receiving zone is a Residential 1 zone. The zone levels (from Table 1) are Day 53 dB(A), Evening 48 dB(A) and Night 43 dB(A).
- **STEP 2.** The distance between the receiver and the generator’s zone boundary is less than 100 metres, so the distance-adjustment is zero under Step 2.
- **STEP 3.** The levels are greater than the base noise levels in Step 3. Take the distance-adjusted levels to Step 4.
- **STEP 4.** The receiving point is in a background-relevant area, as traffic is a significant audible background noise source. The background level is measured using the procedures specified in SEPP N-1.

The measured representative background levels were:

Day:	Monday-Friday (0700-1800), Saturday (0700-1300)	57 dB(A)
	Saturday (1300-1800)	41 dB(A)
	Sunday and public holidays (0700-1800)	41 dB(A)

Evening:	Monday-Sunday (1800-2200)	41 dB(A)
Night:	Monday-Sunday (2200-0700)	29 dB(A)

The background levels are compared to the levels from Step 3, for each period, to see whether it will increase the recommended levels. The recommended maximum noise level becomes the greater of the distance-adjusted level or the base noise level and the background level, plus a margin as specified Step 4.

The levels from Step 4 are:

Day:	Monday-Friday (0700-1800 hours), Saturday (0700-1300)	65 dB(A) †
	Saturday (1300-1800)	48 dB(A)
	Sunday and public holidays (0700-1800)	48 dB(A)
Evening:	Monday-Sunday (1800-2200)	48 dB(A)
Night:	Monday-Sunday (2200-0700)	43 dB(A)

† In this case the Step 3 levels were adopted, apart from the weekday day period when the background levels are elevated. During the weekday day period, background of 57 dB(A) +8 is 65. This is greater than 53 dB(A) level from Step 3. As the high background level is due to traffic from the highway, this level is taken to Step 5.

STEP 5. The background-relevant area is affected by high traffic-noise levels during the day period and the noise-sensitive area is in the Residential 1 zone, so Step 5 applies. All of the Step 4 levels are compared to the reference values in Step 5. The Evening and Night Step 4 levels are lower than the reference values for these periods, therefore the Step 4 levels are adopted as the recommended levels.

For the day period, the Step 4 level (65 dB(A)) is greater than the reference value of 55 dB(A). The next step taken is to check the traffic LA_{eq} , which is obtained from the background measurement data file. The day period traffic LA_{eq} is 68 dB(A).

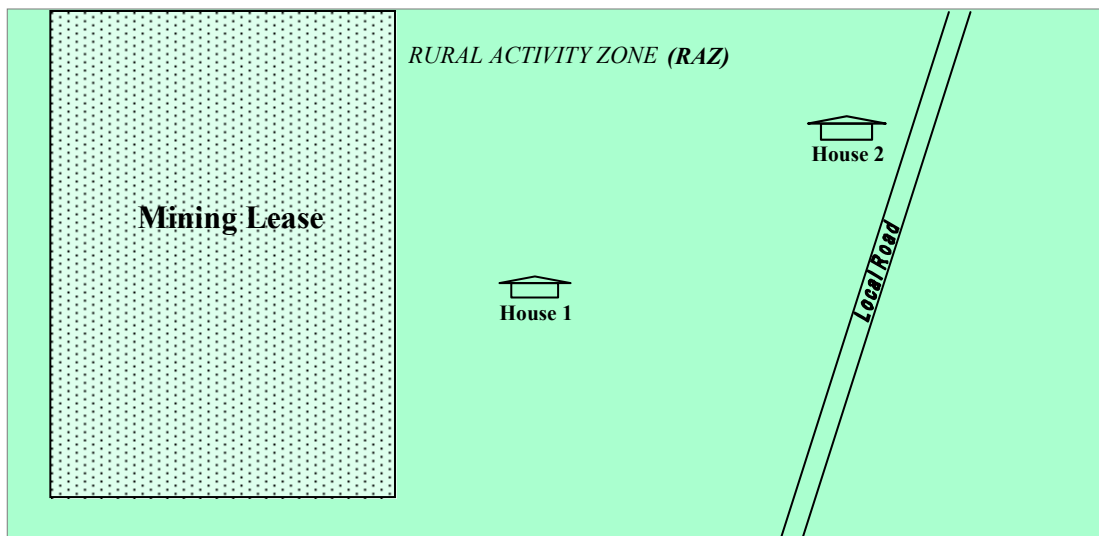
As the traffic LA_{eq} is greater than the reference value +10 (65 dB(A)), row 3 Step 5 table applies. The lower of the Step 4 level (65 dB(A)) and the traffic LA_{eq} -10 dB(A) (58 dB(A)) becomes the recommended level.

The recommended level is 58 dB(A) for the day period. This is greater than the zone level, but the effect of the high traffic noise of the background levels is limited to provide a reasonable outcome for the nearby residents.

The timber mill operations other than debarking are designed to meet the night period recommended level of 43 dB(A). The debarking is designed to meet the day period recommended level of 58 dB(A).

Example 5

An open-cut goldmine is intended to operate in a Rural Activity Zone. The proposed hours of operation are 24 hours per day, Monday to Friday. There are a number of houses in the area, the two closest of which are shown in the figure.



- The proposal is for an earth resources industry in a rural area, so the steps in section 4.2 apply.



SEPP N-1 AND NIRV EXPLANATORY NOTES

- **STEP E1.** As the noise receiver is not in a GWAZ, RCZ, RLZ, IN3Z, SUZ, IN1Z, IN2Z, B3Z or B4Z, the earth resources levels applied are: Day 46 dB(A), Evening 41 dB(A) and Night 36 dB(A).
- **STEP E2.** There are no main roads, highways or freeways nearby and traffic is not a significant audible background sound source. The receiver is not within any other elevated-background area, so the location is not a background-relevant area. There is no need to measure background levels.

The recommended maximum noise levels for both houses become:

Day:	Monday-Friday (0700–1800), Saturday (0700–1300)	46 dB(A)†
	Saturday (1300–1800)	41 dB(A)
	Sunday and public holidays (0700–1800)	41 dB(A)
Evening:	Monday-Sunday (1800–2200)	41 dB(A)
Night:	Monday-Sunday (2200–0700)	36 dB(A)

- † Because the use of the land is for mining purposes, the variations in section 5 with respect to mining, quarrying and land-filling apply in this case. There are special provisions for on-site construction works.
- During 'construction' parts of the project (section 5 variations), as allowed in the approval, the permitted noise levels would be no greater than 56 dB(A) during the day period.

APPENDIX E: NIRV MINES, QUARRIES AND LANDFILLS VARIATIONS – EXAMPLES

NIRV section 5 provides for variations to the recommended levels for particular kinds of mine, quarry and landfill operations. The variations are set out to provide appropriate constraints for industry and should be the basis of decision making by government regulators.

The following examples help to illustrate how an approval could enact a variation.

Example 1

Proposal

An operating landfill is using low-noise mobile plant and currently meets the NIRV recommended levels.

It seeks from EPA a licence amendment for extension of its landfilling area. This includes a plan for cell construction, cell closure and site rehabilitation for the extended area.

The operation of the site dictates that three cells will be progressively filled and closed over a number of years. The proposal is to cap and rehabilitate each cell once landfilling of that cell is complete, rather than undertake one rehabilitation effort at the end of the life of the landfill.

Capping and rehabilitation activities would occur three times over a six-year period. Different groups of houses would be exposed for each cell closure process, and each instance would take three months.

Noise modelling shows that, without additional noise control, the noise from these activities would exceed the recommended levels by up to 5 dB (under favourable atmospheric conditions that increase noise at noise-sensitive locations).

The proponent examines noise-control options and demonstrates that, due to the slope of the site, earth bunds are not a practical method of noise control. The proponent also explores the option of mobile barriers but finds that these would not be a feasible method of noise control.

The proponent seeks approval for three periods of additional noise (up to 5 dB above the recommended levels) during the capping and rehabilitation works, based on the proposal qualifying as 'necessary unshielded works' under NIRV Table 4 (final site rehabilitation, short projects and necessary unshielded works).

Approval decision

EPA considers the proposal to cap and rehabilitate each cell progressively, rather than an alternative approach of placing a temporary cap on cells, replaced by a final cap and rehabilitation at the end of the project. The proponent's community consultation shows that progressive rehabilitation is preferred by local residents on visual aesthetic grounds. EPA also recognises that in most cases the additional noise would only be slightly detectable or not at all detectable to residents.

EPA determines that the proposed approach is reasonable, when considering all these factors.

EPA considers that capping and rehabilitation process is 'necessary unshielded work' under Table 4, as:

- it is 'final landform construction' (Table 4, final site rehabilitation, short projects and necessary unshielded works, column 1, process description for 'necessary unshielded work')
- the work cannot practicably be shielded, due to site topography.

EPA issues a licence amendment with conditions that allow for capping and rehabilitation of the three cells, limited to three months of work in each case. EPA permits these three periods of cell capping and rehabilitation, as:

- the allowance is for a limited period of exposure to each noise-sensitive area, and the work on each cell exposes different noise-sensitive areas (NIRV Table 4, final site rehabilitation, short projects and necessary unshielded works, column 3, point 1)
- the project continues over a significant number of years and the works are well separated (NIRV Table 4, final site rehabilitation, short projects and necessary unshielded works, column 3, point 2).

The additional daytime dB allowance above the recommended levels is limited to the levels necessary to do the works. For example, for the first cell the allowance is 2 dB for exposed houses, and for the final cell the allowance is 5 dB for one house and 2 dB for another.

This additional noise will only occur when the weather increases the noise level at the houses, but these weather conditions are assumed to occur for the purposes of the approval.

Example 2

Proposal

A new mine is proposed near existing residential areas. Without noise-control works such as perimeter barriers or bunds, the general site activities are predicted to exceed the recommended levels at multiple noise-sensitive locations. A significant factor is that vehicle movements must occur along the perimeter of the site, close to the residents.

The proponent examines options for noise control to enable this general site activity noise to meet the recommended levels. Modelling shows that the only effective noise control would come from an 800 m long, 25 m high bund around the perimeter of the site. This would control the vehicle movement and other site noise.

The proponent examines options for building this bund and demonstrates that the only feasible method is to progressively build the bund in 5 m high stages, using on-site material (mine overburden and waste rock). As each 5 m high lift is completed, from end to end, the bund is added to, until the 25 m height is obtained.

Building the bund relies on material from site excavations. This material cannot be supplied at a sufficient rate to complete bund construction quickly, and the entire process is predicted to take eight months. However, the proponent shows that each time a residence is exposed to higher noise, this is for a limited period of time (four to six days), and that the instances of higher noise will be approximately one month apart.

Acoustic modelling shows that, under this method, particular residences will be exposed to noise above the recommended levels from bund construction as the section of the bund closest to them is built. This additional noise will only be experienced under weather conditions that direct noise to the residences. These conditions are assumed to occur for the purposes of the approval.

Approval decision

The approval body recognises that the bund proposal satisfies the tests in NIRV Table 2, 'Installation of constructed noise control works', column 3, point 3. It also recognises that there is community concern about the overall duration of this work and the noise levels that individual noise-sensitive locations will be exposed to from the bund construction. To manage the impacts, the approval body follows NIRV Table 2, 'Installation of constructed noise control works', column 3, points 6 and 7, to ensure that:

- site activities are prioritised to the bund construction, with as much equipment as possible directed to the construction process
- as noisier work is planned, the proponent gives advance notification to residents
- the proponent applies management measures if there are noise complaints, such as working on the less exposed side of the bund where possible.

Example 3

Proposal

A new quarry is proposed. The applicant proposes to use soil and overburden to build perimeter bunds for noise control and visual shielding. The proposal involves building bunds in three areas.

The first is near to the closest exposed residences. Noise modelling shows that, without noise control barriers or bunds, these residents would be exposed to noise 8 dB above the recommended levels. To provide enough noise attenuation to ensure the site meets the recommended levels, bund construction would take three months.

However, with an additional month of adding overburden to the bund, the quarry could further reduce their general operational noise to 3 dB below the recommended levels. Consultation with the closest exposed residents to the first bund shows support for extended bund construction at the beginning of the project, because of its additional noise-control benefit for the life of the quarry operations.

The second proposed bund is in the direction of another residence. Noise modelling predicts that general quarry operations will meet the recommended levels at this residence, without the need for barriers or bunds. The proponent seeks a four-month bund construction process in this area. Due to site topography, it would deliver a modest reduction in general operational noise at this residence, to 2dB below the recommended levels. The noise from the bund construction itself would be within the recommended levels.

A third bund is proposed in the direction of three other residences. Noise modelling predicts that general quarry operations will meet the recommended levels at these residences. The bund construction would deliver a 3 dB reduction in noise at these residences, but the bund construction activity itself would exceed the recommended levels. The bund is also not demonstrated to offer significant visual shielding benefits.

Approval decision – first bund

The approval permits a four-month period for bund construction at the start of the project, for protecting the closest exposed residents. Following the guidance in NIRV Table 2, the noise from this activity is exempted from the day period recommended levels, as:

- it is necessary for the premises to meet the recommended levels (NIRV Table 2, 'Installation of constructed noise control works', column 3, point 1)
- although it is constructed from on-site material, its primary purpose is noise control and it is constructed at the start of the project (NIRV Table 2, 'Installation of constructed noise control works', column 3, point 3)

While NIRV Table 2 advises that exemptions should only be provided for noise-control works necessary for the site to meet the recommended levels (requiring three months of work), the approval allows for the additional month of bund construction (allowing the total of four months). This decision to vary from NIRV Table 2 is based on the community support for additional works and the greater noise-reduction benefit it offers.

Approval decision – second bund

The approval allows construction of the second bund and applies the recommended levels to this work without exemption or variation from the recommended levels, as exemptions are not necessary to enable the works.

Approval decision – third bund

The approval does not allow construction of the third bund, as the proposed bund does not have a primary noise-control purpose to meet the recommended levels (not satisfying NIRV Table 2, 'Installation of constructed noise control works', column 3, point 1, or alternatively point 5 if considered as a 'later-project exemption').

APPENDIX F: NOISE FROM MULTIPLE PREMISES

Under SEPP N-1 and NIRV, the measured effective noise level includes the combined noise from all commercial, industrial or trade noise sources contributing at a measurement point.

Clause 18 of the SEPP N-1 attainment program confirms that, in order to achieve the SEPP N-1 noise limits, each of the contributing premises must reduce noise so that it is quieter than the SEPP N-1 noise limits. This is because noise from multiple premises will add together. This obligation also applies under NIRV Part 3.

The following is a guide for applying these requirements where there are multiple current or anticipated noise sources in an area. It applies to new proposals or noise-reduction works for existing situations.

SEPP N-1 area

New individual noise sources should be chosen, sited or abated so that the noise contribution is 10-15 dB below the noise limit.

New industries, plant expansion or major new sources should be abated to: noise limit $-10 \times \log_{10}(N)$ in decibels at the noise-sensitive area (for each period of the day), where N is the total number of existing and likely contributing industrial plant installations.

When considering the noise design for the proposal, the applicant, noise consultant and approval body should discuss the noise design objectives at an early stage.

NIRV area

In NIRV rural areas industry is encouraged to design plant or operations so that their emissions are less than the recommended levels if there is a likelihood of further industrial growth in the area. The document *Applying NIRV to proposed and existing industry* sets out approaches for managing noise from multiple premises.

The guidance procedure for the SEPP N-1 area above may be used in major urban areas under NIRV.

APPENDIX G: BACKGROUND TO SEPP N-1 AND NIRV

History of SEPP N-1

SEPP N-1 first came into operation on 4 May 1981.

Before developing SEPP N-1, EPA conducted a 'Melbourne noise survey' (1978). This measured background levels in a range of land-use situations.

The central tool for determining noise limits under SEPP N-1 is the zoning level. In the Policy, the zoning level is determined by the proportion of residential, commercial or industrial land around the noise-sensitive area. The method for determining the zoning level was based on the results of the Melbourne noise survey. This means that the zoning levels usually reflect the background levels in an area. (In 2007, EPA released a subsequent noise study, which showed that background levels have not substantially changed since SEPP N-1 was released.)

After a number of years, it became apparent that the Policy's assessment procedures could be improved and simplified. Subsequently they were revised and a draft released for public comment in December 1987. The 1989 version of the Policy replaced the SEPP declared in 1981. It incorporated several changes, such as a simplified assessment procedure for small premises.

The 1992 variation to SEPP N-1 introduced the incorporated document EPA publication 316, *Designation of types of zones and reservations in the metropolitan region planning schemes for the purposes of State Environment Protection Policy (Control of Noise from Commerce, Industry and Trade) No. N-1*. SEPP N-1's noise limits are determined by reference to the planning scheme zoning, with different zones classified according to their 'type' (for example, residential, commercial or general industry). The incorporated document provides these zone type classifications, where they were previously documented in SEPP N-1 itself.

The 2001 Variation introduced the environment improvement plan provisions for industry that, because of historical encroachment of sensitive uses, could not meet the SEPP N-1 noise limits. It also introduced a commensurate policy requirement for planning and responsible authorities to have regard to the Policy when making planning decisions.

EPA has not reviewed the boundaries of the SEPP N-1 area.

Reasons for limiting the Noise SEPP to the Melbourne area

When SEPP N-1 was developed, EPA recognised that it was not an appropriate policy tool for noise control in rural areas. The main reasons for this concerned:

- rural planning schemes at the time of SEPP N-1 development
- how SEPP N-1 applies limits
- the SEPP N-1 method in quiet rural settings
- protection of areas where existing quiet is specifically valued.

Rural planning schemes at the time of SEPP N-1 development

At the time SEPP N-1 was developed, there were not consistent planning schemes across Victoria and many rural councils did not have planning schemes at all. This meant that the SEPP N-1 method (based on land-use zoning) could not have been broadly applied outside Melbourne.

How SEPP N-1 applies limits

SEPP N-1 being a statutory policy, all industries within the SEPP N-1 area must meet the SEPP 'environmental quality objectives'/noise limits (noting that EIP provisions were introduced at a later time).

However, in rural situations, industry sometimes cannot be located away from residents – for example, where its location is determined by a mineral or stone resource. Also, some farming activities can create noise impacts that may be difficult to reduce at nearby residences.

In these cases, protecting amenity by noise control at the source only is sometimes not practicable and reasonable outcomes may involve other measures such as noise control at sensitive locations. EPA did not consider it appropriate to have SEPP N-1's mandatory noise limits applying in these situations. Given the structure of SEPP N-1, guidelines were preferred to provide additional flexibility in finding reasonable outcomes.

The SEPP N-1 method in quiet rural settings

SEPP N-1 bases its noise limits on a combination of land zoning and background levels. SEPP N-1 limits 'chase' the background, so that where background levels are low, the noise limits are lower.

Background levels in rural areas are generally low to very low, resulting in almost uniform low noise limits under the SEPP N-1 method, even in situations where the land is provided for industrial purposes.

EPA considered that this outcome would sometimes not be reasonable, as industrial facilities in a rural setting could be subject to lower noise limits than were necessary to provide reasonable protection for nearby residents.

Protection of areas where existing quiet is specifically valued

EPA considers that, in quiet rural settings, it is important for decision makers to recognise that new industrial premises would change the local soundscape, sometimes to a significant degree. This differs from city areas, where compliant industry noise will not intrude greatly above the background noise from traffic.

SEPPs are generally written so that 'environmental quality objectives' (such as SEPP N-1 noise limits) are defined and, where these are met, policy compliance would be achieved. EPA considered that this structure to SEPPs did not give sufficient scope to recognise that, in some quiet rural settings, a decision maker might need to value preservation of existing quiet above that of meeting designated noise levels. Even though this concept might only be rarely applied, EPA considered that guidelines would better provide for this possibility than SEPP N-1 could.

History of NIRV

EPA first released guidelines for rural industry noise in 1989 (*Interim guidelines for control of noise from industry in country Victoria N3/89* (N3/89)). These guidelines set low noise levels to be met in very quiet rural areas. They also advised that, in areas where background levels were comparable to metropolitan Melbourne, the SEPP N-1 methods be applied to determine appropriate noise levels for industry.

N3/89 did not provide certainty for setting noise controls in all situations, as it did not provide clear recommendations in areas where background levels were not 'very low' yet could not be considered to be like Melbourne. For example, in industrial zones in smaller towns, N3/89 was not clear on how to set noise levels.

In addition, N3/89 did not provide the same kind of recognition of land-use zoning-based amenity as SEPP N-1 provided.

NIRV replaced N3/89, to provide greater certainty and transparency in the setting of appropriate noise levels for industry for both rural and urban situations, and to extend SEPP N-1's principles of planning-based noise levels to rural settings. The more rigorous approach under NIRV provides a balance between the social and economic value of industry in regional Victoria, and the noise impact on communities.

NIRV was developed through two consultation drafts in 2000 and 2010, and extensive consultation with industry, government and communities.