

How to reduce noise from your business



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Purpose

This fact sheet is for industrial, commercial and trade businesses that make noise, or have received reports about noise issues. It is designed to help businesses understand what the Environment Protection Authority (EPA) expects for the control of general noise from businesses, such as machinery, plant and equipment.

Why noise is an issue

Noise from businesses can harm the health and wellbeing of neighbours, especially when it interrupts sleep. Excessive noise can cause stress, anxiety and irritability, and reduce quality of life. Ongoing noise can seriously impact people's health.

People tend to be more affected by:

- short, sharp noises such as hammering or metal-on-metal contact
- tonal noises such as humming, whining and buzzing
- low frequency noise.

Your obligations

Under nuisance and environmental law, businesses are obliged to address all unreasonable or nuisance noise, regardless of the number of people affected.

Noise emissions must comply with the relevant state environment protection policies (SEPPs).

Businesses must not cause or allow nuisance noise or unreasonable noise. Government regulators (for example EPA, local governments and the Department of Primary Industries [DPI]) can take action on these issues.

Businesses must also meet any specific noise requirements under their planning permit, DPI work plan, work authority or EPA licence.

Maximum noise levels or limits are set to protect people in 'noise sensitive areas.' A noise sensitive area is usually a home but can include motels, tourist establishments, hospitals and other buildings where people relax or sleep.

Schools and offices are not noise sensitive areas, but the advice in this fact sheet can be used to reduce noise affecting these sites.

Meeting SEPP N-1 and NIRV

What noise levels do I need to comply with?

The maximum noise level allowed depends on where the business is located:

Area	Compliance requirement
In the Melbourne metropolitan area	<i>State Environment Protection Policy (Control of Noise from Commerce, Industry and Trade)</i> No. N-1 (SEPP N-1)
In regional Victoria, including towns and cities	<i>Noise from Industry in Regional Victoria (NIRV)</i> (EPA publication 1411)

Go to EPA's website www.epa.vic.gov.au/noise for these documents and information on where each document applies (including maps). SEPP N-1 is a law that sets noise limits that must not be exceeded. NIRV is a guideline that recommends maximum noise levels that should not be exceeded.

The noise from a business site needs to be below the specified noise levels in noise-sensitive areas (see 'obligations').

Businesses need to comply during all times of the day and night, and all days of the week.

The noise levels to comply with apply to the combined noise from businesses affecting the same noise sensitive area at the same time.

What types of noise sources are covered?

SEPP N-1 and NIRV cover all scales of commerce, industry and trade, including extractive industry and mining. This includes noise from:

- mechanical equipment in shops, restaurants, warehouses, schools, offices and industrial sites
- common air conditioning units servicing apartment blocks (but not individual air conditioners at apartments)
- deliveries and vehicles moving materials on site, including trucks.

Noise that is not addressed using SEPP N-1 and NIRV

There are some types of noise that are not addressed under SEPP N-1 and NIRV such as:

- noise from audible intruder, emergency or safety alarms, including reverse beepers
- low frequency noise

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- occasional startling noises such as loud bangs, noisy roller doors and infrequent heavy vehicle movements.

These types of noise are often an issue for residents during the night or early morning. Even though they are not suitable to assess under SEPP N-1 or NIRV, EPA still expects businesses to address these issues and minimise the impact on the community (see NIRV section 2.3).

How are the maximum noise levels set?

SEPP N-1 and NIRV outline steps for working out the maximum noise levels/limits a business needs to comply with. The maximum noise levels are based on the planning scheme land zoning and background sound levels in the area. The levels are generally higher in industrial areas or areas with higher background sound, such as near busy roads. Lower noise levels are set for quiet, suburban and rural areas.

Different noise levels apply during the day, evening and night, with the lowest levels required at night.

Maximum noise levels also vary between days of the week. They are often lower on weekends because these are more noise sensitive times and background sound is usually quieter.

How is noise from my business measured?

To work out whether a site complies, the noise from the business is compared with the maximum noise levels set under SEPP N-1 or NIRV.

The SEPP N-1 measurement method is used for assessments in all areas (Melbourne and regional Victoria). Assessments made using the SEPP N-1 method usually need to be made by acoustic consultants, engineers, or by a regulator.

Measurements might be made at different times of the day or week to assess compliance. If you operate in the same way at all times of the day and night, then taking measurements at night is usually all that is required.

The noise measured in a noise sensitive area (for example at a house) is adjusted to account for any annoying characteristics of the noise. These include:

- tones (hums, whines, buzzes and squeals)
- intermittent noise (stop-start or louder-softer noise such as from a compressor or refrigeration unit)
- impulses (hammering, dropping).

Where the noise features these characteristics, a penalty is applied to the measured noise. There are also other adjustments that account for:

- how long the noise can be heard over a 30-minute period
- local factors at the measurement location, such as reflection of noise from a wall.

The result is an effective noise level for the site.

The compliance status is worked out by comparing the effective noise level to the SEPP N-1 noise limit or NIRV recommended maximum noise level.

If the effective noise level is over the limit or recommended level, the noise emitted will need to be reduced.

What if more than one business makes noise that affects the same noise sensitive area?

Where more than one business contributes to noise that exceeds the set maximum noise levels, each business needs to reduce the noise it emits.

This means each business will have to reduce their noise levels to below the levels calculated using SEPP N-1 or NIRV (see SEPP N-1 and NIRV explanatory notes).

What other factors can influence my compliance?

A change of land use such as planned residential development or construction of new industrial facilities nearby might make a site non-compliant with the maximum noise level/limit.

Businesses should consider the likelihood of a change in land use or new industrial neighbours when reducing noise in response to community concerns. It is also advised to consider the potential for future upgrades at your site and choose noise control measures that are compatible with these future plans.

What about reducing noise further below the maximum level?

SEPP N-1 and NIRV place obligations on businesses to take steps to reduce noise to below the noise limit or recommended level.

SEPP N-1 advises that when equipment is to be replaced or new equipment installed, the quietest equipment available should be used where a significant reduction in noise exposure can be expected to result.

NIRV requires that in addition to meeting the recommended levels, businesses should take reasonable opportunities to further reduce noise and apply routine noise control measures where these will reduce noise in sensitive areas.

The SEPP N-1 and NIRV Explanatory Notes (section 4) set out the expectations for different types and scales of businesses in applying best-practice noise control measures.

How can I reduce noise?

Controlling noise

To avoid excessive noise, it is usually most cost-effective to choose quieter equipment at the outset, during plant replacement or upgrade.

As well as choosing quieter equipment, businesses can reduce the noise in noise sensitive areas through controls at the source or along the noise transmission pathway.

Controls at the source (the equipment or production process) are usually more cost-effective and acceptable than pathway controls.

Source noise control examples:

- installing or replacing with quieter equipment
- maintaining equipment by replacing or adjusting loose or worn parts, lubricating moving parts or modifying components to remove clatter
- using centrifugal rather than propeller fans

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- providing machines with adequate cooling fins rather than noisy fans
- choosing quiet nozzles for compressed air systems
- reducing impact noise from parts falling into metal bins by lining the bins with rubber and using 'interrupted-fall collectors' (variable height conveyors and collectors to reduce impact noise by reducing the distance an object falls onto a hard surface)
- Isolating vibration to reduce noise generated by excitation of panels
- minimising the number of noisy machines running at any one time
- avoiding running noisy machines at night.

Sometimes the best way to reduce the effective noise level is by targeting tonal or impulsive characteristics of the noise.

Pathway noise control examples:

- changing the location of noise sources within the premises, such as relocating equipment to increase the distance from the noise source to the receiver, with intervening buildings to act as barriers
- using barriers and enclosures for equipment
- using barriers or bunds for mobile or outdoor plant
- using mufflers on exhaust outlets
- using vibration absorbers and dampers
- lining ducts or lined plenum chambers for air-handling systems
- isolating vibrating machines from noise-radiating structures
- active noise control (phase-reversed noise from loudspeakers; effective on a limited range of noise sources).

(Bies DA and Hansen CH, 2009, 'Engineering Noise Control: Theory and Practice'. pp 4-7 *E&FN Spon*, London).

The effectiveness of barriers and enclosures depends on their mass and size. Avoid gaps and perforations. Sound-absorbing materials inside the enclosure/barrier are often also needed.

Movement of vehicles and materials

Solutions to reduce noise from the movement of vehicles and materials must also meet Occupational Health and Safety (OH&S) requirements.

Ways to control noise from the movement of vehicles and materials include:

- locating entrance and exit points away from noise sensitive areas
- minimising the use of mobile plant operating outdoors at night
- modifying activities to minimise the amount or duration of vehicles reversing that is required to

perform a task, while not compromising safety (for example, one-way traffic flow around the site)

- installing barriers or bunds
- maintaining the plant and equipment to ensure that the designers' noise-output specifications are always met.

Reversing beepers may be able to be replaced with 'broadband' or 'smart' alarms, or inaudible warning systems. OH&S requirements for use of warning systems must be met.

Getting help

You might need the advice of an acoustic products provider, acoustic consultant or acoustic engineer.

The approach to take depends on the type and number of noise sources. The table below gives a general guide.

Noise source	Who to engage
Single sources that are marginally over the standards	The equipment manufacturer - can often supply routine products
Equipment of any scale that significantly impacts on neighbours	An acoustic product supplier or acoustic consultant/engineer
A facility with many noise sources	An acoustic product supplier or acoustic consultant/engineer - to assess the noise, report on the contributing sources and propose noise control measures
A business near to other noisy commercial or industrial sites	An acoustic product supplier or acoustic consultant/engineer - additional noise control may be necessary

Choosing an acoustics specialist

Engage reputable, appropriately qualified, experienced, competent acoustic engineers or consultants.

There is a listing of acoustical consultants in the Yellow Pages. The Association of Australian Acoustical Consultants (www.aaac.org.au) and the Australian Acoustical Society (www.acoustics.asn.au) can also assist in advising on the most appropriate person or company to engage.

For acoustic product suppliers contact the Association of Noise Control Engineering Inc. (www.ausmanufacturers.com.au/noisecontrol) or the Australian Acoustical Society.

What if I can't meet the specified noise level?

SEPP N-1 and NIRV have limited provisions for businesses that cannot practicably meet the maximum noise levels.

In the Melbourne metropolitan area:

SEPP N-1 has an environment improvement plan (EIP) process for existing sites that cannot practicably comply with the noise limits. An EIP enables a business to set a long-term plan for noise control. Compliance with the EIP achieves compliance with SEPP N-1.

Only businesses that have been operating in their current state from before 31 October 2001 are eligible for the EIP process.

The business develops the EIP in consultation with the affected parties and EPA. To take effect, the EIP must be given force by a notice issued by EPA.

The EIP process is set out in the publication 2001 Variation to SEPP N-1, Victoria Government Gazette Number s183.

In regional Victoria:

There is a process for circumstances where the noise from a business cannot be reduced to the recommended maximum noise levels. This process is outlined in section 4 of the publication *Applying NIRV to Proposed and Existing Industries*.

The alternative process generally only applies to larger industrial facilities experiencing resource or other location-based constraints.

The outcomes of this process are formalised through a compliance tool, such as an EPA notice.

More information

- *State Environment Protection Policy (Control of Noise from Commerce, Industry and Trade) No. N-1*
- *Noise from Industry in Regional Victoria* (EPA publication 1411)
- *Applying NIRV to Proposed and Existing Industries* (EPA publication 1413)
- *SEPP N-1 and NIRV Explanatory Notes* (EPA publication 1412)

For information on other noise sources such as music, construction sites, or for occupational noise exposure visit EPA's website www.epa.vic.gov.au