

Environment Protection Authority

Evaluation distances for effective air quality and noise management

Evaluation distances for effective air quality and noise management

For further information please contact:

Information Officer
Environment Protection Authority
GPO Box 2607
Adelaide SA 5001

Telephone: (08) 8204 2004

Facsimile: (08) 8124 4670

Free call (country): 1800 623 445

Website: <www.epa.sa.gov.au>

Email: <epainfo@epa.sa.gov.au>

ISBN 978-1-921495-76-2

August 2016

Disclaimer

This publication is a guide only and does not necessarily provide adequate information in relation to every situation. This publication seeks to explain your possible obligations in a helpful and accessible way. In doing so, however, some detail may not be captured. It is important, therefore, that you seek information from the EPA itself regarding your possible obligations and, where appropriate, that you seek your own legal advice.

© Environment Protection Authority

This document may be reproduced in whole or part for the purpose of study or training, subject to the inclusion of an acknowledgment of the source and to it not being used for commercial purposes or sale. Reproduction for purposes other than those given above requires the prior written permission of the Environment Protection Authority.

Contents

Abbreviations	1
Evaluation distances for effective air quality and noise management	3
Explanatory notes	5
Relationship to legislation and other guidance documents	6
Application of recommended evaluation distances	7
Sensitive land uses	7
Factors that need to be considered when preparing a submission	8
Relationship between evaluation distances and activity boundaries	8
Recommended minimum distances	10
Appendix 1 Recommended evaluation distances	12
Appendix 2 Recommended evaluation distances for poultry farms	43
Appendix 3 Further examples of evaluation distance profiles	47
References	49
Glossary	51

List of figures

Figure 1	Activity boundary enclosing all related activities and operations from which emissions may arise and evaluation distance	9
Figure 2	Scenarios where the activity boundary is less than the property boundary and there is (a) additional mitigation of impacts on site and (b) partial mitigation of impacts on site	9
Figure 3	Evaluation distances applied to components of an activity and the resulting envelope within which further evaluation is required	10
Figure 4	Recommended minimum distance, evaluation distance and area where environmental risk should be assessed and managed	11
Figure 5	Activity boundary encloses several similar activities under a single owner	47
Figure 6	Precinct with several similar activities under different owners and operators	47
Figure 7	Effect of access roads/ under a single owner/operator	48
Figure 8	Biased or irregularly shaped evaluation distance	48

Abbreviations

Air EPP	<i>Environment Protection (Air Quality) Policy 2016</i>
BATEA	best available technology economically achievable
Biosolids guideline	<i>Draft South Australian biosolids guidelines for the safe handling and reuse of biosolids (2009)</i>
BOD	biological or biochemical oxygen demand
Emissions Manual	<i>Emission testing methodology for air pollution, Version 2 (2012)</i>
EPA	South Australian Environment Protection Authority
EP Act	<i>Environment Protection Act 1993</i>
GED	general environmental duty
GLC	ground level concentration
Landfill guidelines	<i>Guidelines for environmental management of landfill facilities (municipal solid waste and commercial and industrial general waste) [2007]</i>
Music venue guidelines	<i>Music noise from indoor venues and the South Australian Planning System (2015)</i>
Noise EPP	<i>Environment Protection (Noise) Policy 2007</i>
NOx	oxides of nitrogen
PAH	polycyclic aromatic hydrocarbons
Rail noise guidelines	<i>Guidelines for the assessment of noise from rail infrastructure (2013)</i>
VOC	volatile organic compound
Water Quality EPP	<i>Environment Protection (Water Quality) Policy 2015</i>
WHS	work health and safety

Evaluation distances for effective air quality and noise management

Effective management of air and noise emissions across interfaces between activities and people or sensitive environments in the vicinity (often called sensitive receptors or sensitive receivers) is important to ensure that communities are adequately protected from the range of impacts. This will continue to be a challenge in South Australia as populations grow and urban densification increases. Several approaches may be needed to understand and manage the risks to communities from ambient air quality and exposure to environmental noise.

Management of environmental risk is a core principle underlying the recommended evaluation distances. The EPA receives proposals for activities in areas that may already have elevated local levels of air pollutants or noise. In these cases the EPA will necessarily consider whether new emissions will raise environmental risks to unacceptable levels. Standard assessment tools need to include typical background levels and cumulative impacts, and proponents will need to take these into account when assessing the potential environmental impacts of the proposed activity.

This publication is one of a suite of EPA guidance tools for use by planning authorities, developers, owners of licensed and unlicensed industrial plants, planning and other consultants, government departments, and the community. It encapsulates information that underpins EPA advice on proposed new or expanding developments, Development Plan Amendments, or changes to licensed industrial processes. This publication explains the type of information to be provided to the EPA to facilitate smooth processing and assessment of applications/submissions, avoiding unnecessary delays and costs to proponents.

This publication supersedes the *Guidelines for separation distances* (2007). The use of the phrase 'recommended evaluation distances' is consistent with terminology adopted previously in the [Guidelines for the assessment of noise from rail infrastructure](#) (2013). This reflects the nature of these distances as recommendations rather than strict 'lines in the sand' and the final distances would normally be determined after evaluations of environmental impacts of proposals have been completed.

The appendices provide recommended evaluation distances from polluting activities, within which potential adverse impacts on sensitive receptors need to be assessed:

- [Appendix 1](#) covers a range of general activities.
- [Appendix 2](#) focuses on odour from poultry farms.

In utilising the recommended evaluation distances it is important to keep the following general advice in mind:

- Recommended evaluation distances are intended to be used for both:
 - proposed new or expanded activities near existing sensitive land uses, such as residential areas; and
 - proposed new or encroaching sensitive land uses near existing activities.

They are not to be applied retrospectively to existing interfaces between current activities and sensitive uses that may already be within the distance. In these circumstances the EPA manages the risks under existing authorisations and programs.

- Where a proposed separation is greater than the relevant evaluation distance, the EPA is unlikely to request specific evaluation of impacts predicated on typical activities except where there is a potential for ground level concentrations (GLCs) of pollutants to exceed criteria.

The EPA reserves the right to seek this information if it considers it a necessary part of the assessment.

- If a proponent wishes to reduce the distance, the EPA will request the proponent to demonstrate that adverse impacts are reduced to acceptable levels (or below). See [Factors that need to be considered when preparing a submission](#).

These levels may include recommended ground level concentrations GLCs, odour criteria or relevant noise criteria.

As such this publication should be read in conjunction with other relevant documents.

There is still an obligation to meet requirements of legislation (including legislated criteria in environment protection policies), regardless of whether evaluation distance requirements can be met.

Recommended evaluation distances are not, *in any sense*, intended to address work health and safety (WHS) issues for on-site personnel, fire or explosion risks. Proponents and planning authorities should seek appropriate advice from relevant government agencies.

Explanatory notes

There is a wide variety of sources of air and noise pollution. Many of them are industrial but not all. For example, emissions from vehicles also contribute significantly to pollution, especially in urban areas, and can adversely affect nearby communities if adequate separation is not provided.

Evaluation distances¹ provide an envelope around an activity (or multiple activities) within which environmental risks need to be assessed against current knowledge, technologies and practices.

In practice, activities may be brought closer to sensitive land uses² than the recommended evaluation distance, provided the proponent can demonstrate to the EPA (or relevant planning authority) that adverse environmental impacts will meet appropriate environmental criteria and will not compromise amenity. Examples of environmental criteria include:

- ground level concentrations (GLCs) and odour levels within the *Environment Protection (Air Quality) Policy 2016*
- relevant noise criteria within the *Environment Protection (Noise) Policy 2007*
- criteria in other policy statements, codes of practice and guidance documents published by the EPA or other state government agencies
- criteria within Australian Standards
- localised ambient air quality objectives.

Evaluation distances form part of a suite of tools which assist with protection of environmental air and noise values near an activity, whether the activity is licensed by the EPA or not. For example:

- Major roads have an evaluation distance which is consistent with other state government guidance.
- Some other activities are also included on the basis of known amenity impacts (including evidence from complaints records), even though they are not *activities of environmental significance* under the [Environment Protection Act 1993](#) or [Development Regulations 2008](#).

It is important to note that this publication has a primary focus to ensure that environmental risks are reduced to levels below those evaluated against established environmental values, including standards or criteria based on human health, amenity and nuisance, and adverse impacts on other sectors of the environment.

Examples of risks to wider environmental values include the likelihood of damage to vegetation or animal health from fluoride emissions from brick works, ceramic works or fertiliser facilities. Such instances may have ramifications for economic activity downwind of an activity, as well as carrying risks for native flora and fauna. Proponents should discuss concerns with EPA advisers at the earliest possible stages of a proposal.

There may be relatively rare instances when a recommended evaluation distance will not by itself provide sufficient protection for sensitive uses. For example, when an emission is likely to result in an exceedence of the relevant GLC beyond the evaluation distance, the GLC will take priority for assessing impacts.

The EPA has also included recommended minimum distances for a small number of activities. This is a form of evaluation distance which will apply to those activities where without some minimum separation, the EPA's experience indicates that the *residual environmental risk* remains unacceptable, even with the best management processes and

¹ For the purposes of this document, the term 'evaluation distance' embodies other terminology such as buffer distances, buffer areas or separation distances, which may still appear in reference documents.

² Within this document the term 'sensitive land use' is used descriptively to include those uses defined in section 3 of the *Environment Protection Act 1993* and others such as those listed under [Sensitive land uses](#).

technologies in place. Among other concerns, this recognises that despite having the best will in the world, plant and equipment can fail at times and atypical emissions may occur which impinge on neighbouring communities. Examples are:

- intense odour, which may include area sources, landfills and wastewater treatment ponds
- fugitive dust sources, such as stockpiles, earth-moving activities and unsealed roads
- excessive noise from activities such as external operations involving crushing and grinding.

The inclusion of a minimum distance does not imply that the EPA (or relevant planning authority) will approve or support a proposal for an activity at (or near) that distance without appropriate justification. Proponents will still need to demonstrate in their submissions that potential adverse environmental impacts have been adequately addressed.

Relationship to legislation and other guidance documents

The *Development Act 1993* and the *Environment Protection Act 1993* (EP Act) provide the legislative basis for a range of regulations, policies and guidance documents for environmental management. Section 25 of the EP Act creates a general environmental duty (GED) to take all reasonable and practicable measures to prevent or minimise environmental harm.

Environment protection policies (EPPs) set out detailed requirements for protecting particular aspects of the environment, and may include mandatory provisions. Guidance documents provide more detailed information to assist in meeting the GED or policy requirements. They provide flexibility in assessing proposals and developing licence conditions, as our knowledge about environmental impacts advances.

There is a range of policies and guidance documents related to air quality and noise, as well as other media such as surface and ground water, land and marine environments. This document should be read in conjunction with relevant guidance documents, policies and codes of practice, which may include:

- *Environment Protection (Air Quality) Policy 2016* (Air EPP)
- *Environment Protection (Noise) Policy 2007* (Noise EPP)
- *Ambient air quality assessment*
- *Emission testing methodology for air pollution* (Emissions Manual)
- *Guidelines for the assessment of noise from rail infrastructure* (Rail noise guideline)
- *Wind farms environmental noise guidelines* (Wind farm guideline)
- *Music noise from indoor venues and the South Australian planning system* (Music venue guideline)
- *Guidelines for the use of the Environment Protection (Noise) Policy 2007* (Noise policy guideline)
- *Environment Protection (Water Quality) Policy 2015* (Water Quality EPP)
- *Draft South Australian biosolids guideline for the safe handling and reuse of biosolids* (Biosolids guideline)
- *Wastewater lagoon construction guideline*
- *Compost guideline*
- *Guidelines for environmental management of landfill facilities (municipal solid waste and commercial and industrial general waste)* [Landfill guidelines]
- [Declared Water Protection Areas](#) under the EP Act.

Application of recommended evaluation distances

Recommended evaluation distances are designed to be:

- relatively simple and rapid for all parties – proponents, communities, state and local governments – to determine the starting point for assessment:
 - where existing separation exceeds the relevant evaluation distance, further assessment is generally not necessary
 - this may reduce costs to both the proponents and planning authorities.
- transparent – reproducible and consistent for all proposals with similar configurations
- conservative – they reflect performance of typical activities; however proponents may be able to demonstrate that smaller distances are appropriate.

In general, the EPA uses evaluation distances to assess proposals for long-term developments or changes. Shorter term processes that may affect neighbours would generally be managed through specific controls, including approvals and communications plans.

Sensitive land uses

The EPA may consider the following as sensitive land uses:

- caravan parks
- childcare centres
- community centres
- consulting rooms
- educational institutions
- hospitals
- hotels and motels
- nursing homes and retirement villages
- parklands, recreation areas and reserves (regular public use, eg sporting fields)
- residential dwellings and associated private outdoor recreational areas (including detached dwellings, multiple dwellings, flat/apartment buildings, row dwellings and semi-detached dwellings)
- tourism accommodation
- residential zones.

It is also important to provide a reasonable level of amenity for outdoor areas associated with schools, educational institutions and hospital grounds.

Best available technology economically achievable (BATEA)

Evaluation distances embody the principle of best available technology economically achievable (BATEA), requiring processes and emissions control technologies that commensurate with current practice for the industry sector. BATEA forms part of a 'reasonable and practical' approach to regulation of industry. However, BATEA does not remain fixed and will evolve as more effective technologies become competitive. Therefore, evaluation distances are not a substitute for effective source control, cleaner production methods or facility management.

Factors that need to be considered when preparing a submission

When preparing a submission, either for changes to an existing plant or a new activity, or for a sensitive land use proposed near an existing activity, proponents should consider a range of factors including:

- scale of operation
- complaints history
- topography, meteorology, other local characteristics and results of air quality or noise modelling (refer to relevant documents)
- up-to-date knowledge of environmental impacts of an existing plant on the site, or similar plants elsewhere
- types of land-uses being impacted
- potential incompatibilities between industrial/commercial activities, eg chemical works and food processing, noise, odour or dust impacts of one activity on employees of a nearby operation
- patterns of emission and likely impacts, eg batch or continuous processes, probability of plant failures, day or night time sensitivities
- type and rated performance of emission control technology or modified processes, eg BATEA typical for the industry, or new technologies with improved performance
- systems for managing residual emissions and their impacts, eg acoustic barriers in a residential area
- continuing ownership and maintenance of important features that mitigate environmental impacts.

Where a new industry is proposed for which no evaluation distances are recommended then proponents are advised to approach the EPA for advice.

Relationship between evaluation distances and activity boundaries

An *activity boundary* encloses all related activities and operations from which residual air or noise emissions may arise. It encloses all sources of potential emissions such as plant and equipment, buildings, stacks, stockpiles and access roads. For example, it is normal practice when assessing piggeries to consider impacts from effluent lagoons as an integral part of the effects associated with a pig shed.

The concepts of activity boundary and evaluation distance are shown in Figures 1 and 2.

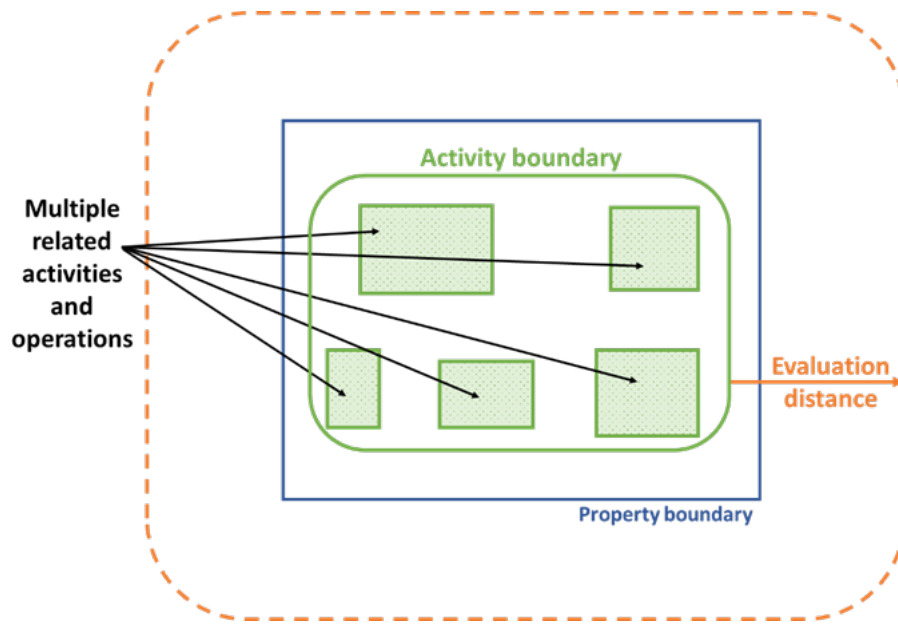


Figure 1 Activity boundary enclosing all related activities and operations from which emissions may arise and evaluation distance

The activity boundary may not necessarily coincide with the property boundary. For example, the property boundary may be much larger than the activity boundary. There are two scenarios for this situation, as illustrated in Figure 2:

- The property boundary is larger than the recommended evaluation distance, providing additional mitigation of off-site impacts over that resulting from the evaluation distance alone.
- The more usual situation is where the recommended evaluation distance is outside the property boundary. In this case the distance between the activity boundary and property boundary will only provide part of the required environmental risk reduction.

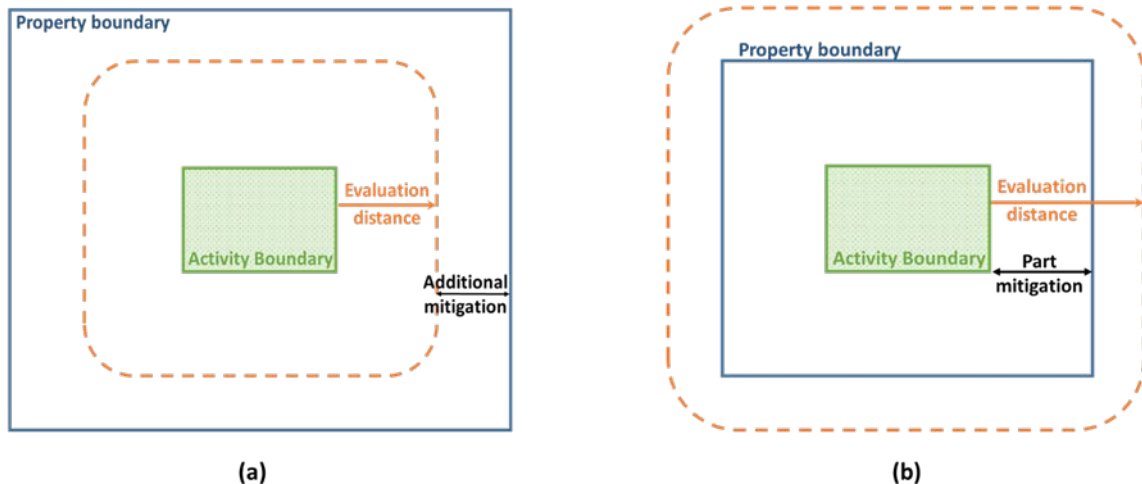


Figure 2 Scenarios where the activity boundary is less than the property boundary and there is (a) additional mitigation of impacts on site and (b) partial mitigation of impacts on site.

A further and very common scenario is where operations continue outside the property boundary, for example trucks accessing public roads or rail corridors. Impacts from operations outside the property boundary are not normally managed through evaluation distances but may be subject to regulatory constraints such as licence conditions.

Some examples of other potential scenarios are illustrated in [Appendix 3](#).

Consideration should also be given to the realistic likelihood of activities or certain operations on the property to be relocated on-site. This could potentially reduce the distance between the activity boundary and any sensitive receptors depending on how the activity boundary was originally defined.

The potential expansion of the operations should also be considered when determining the activity boundary and when setting up initial evaluation distances, otherwise the expansion could be prevented due to the lack of separation.

There are some situations where it may be better to consider related activities and operations separately instead of looking at the activity as a whole. For example, the shape of a site may mean that the range of activities is not easily encompassed within a single evaluation distance. In these situations multiple evaluation distances can be determined and applied to the different components of the activity. This will need to be addressed on a case-by-case basis in consultation with the EPA.

The resulting 'envelope' will not necessarily be uniform as it depends on the shape and dimensions of the site and the types of activities or operations producing emissions. This concept is illustrated in Figure 3 where there are three emission sources, each with a different evaluation distance. This results in an irregular shaped envelope or 'potential impact area' within which environmental risks need to be considered in more detail. The size and shape of this envelope will most likely change with further evaluation, as well as if the activities or operations are relocated to a different part of the site.

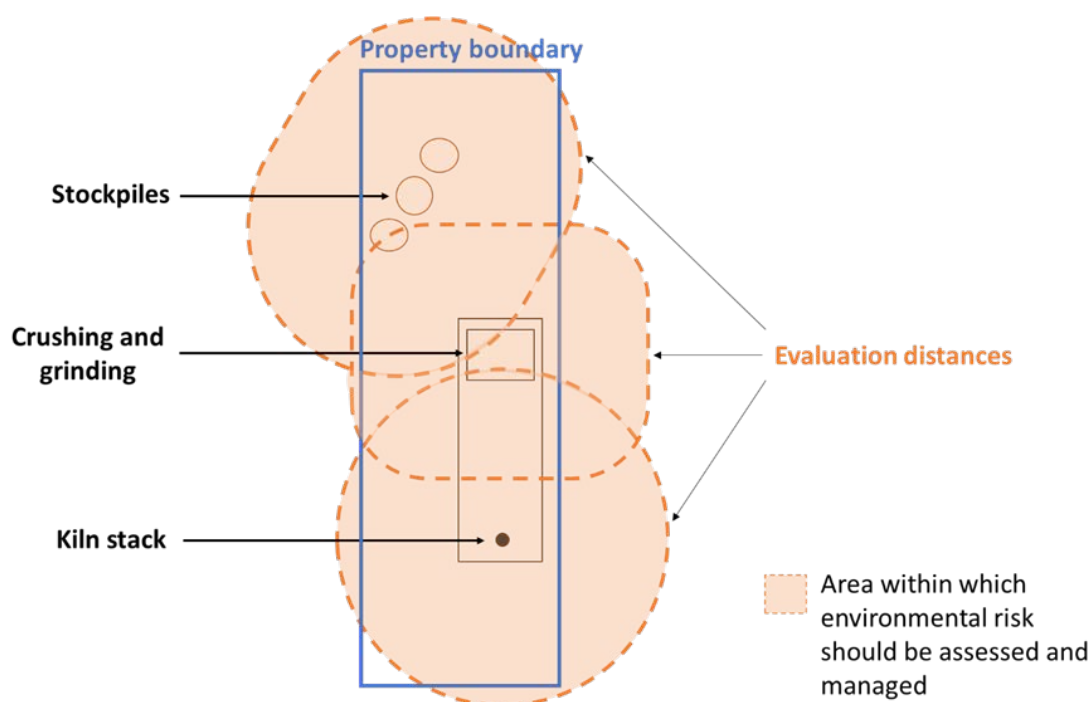


Figure 3 Evaluation distances applied to components of an activity and the resulting envelope within which further evaluation is required.

Recommended minimum distances

Recommended minimum distances are applied to a small number of activities where, without some minimum separation, the EPA's experience indicates that the residual environmental risk remains unacceptable, even with the best management processes and technologies in place.

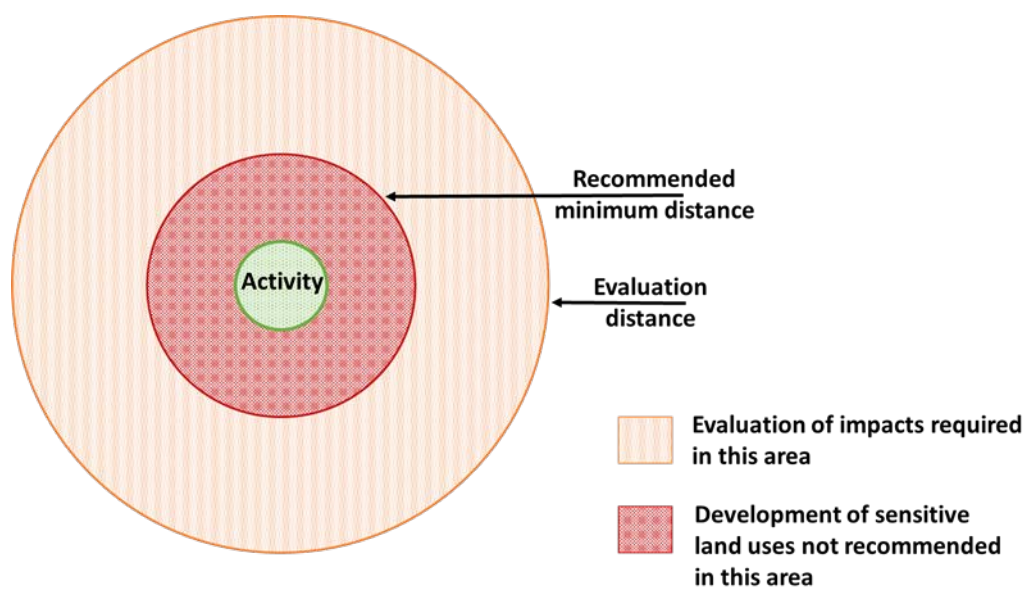


Figure 4 Recommended minimum distance, evaluation distance and area where environmental risk should be assessed and managed

Appendix 1 Recommended evaluation distances

Note: For scheduled activities, the scale of operation is as defined in Schedules 21 and/or 22 of Development Regulations 2008 unless otherwise stated.

Petroleum and chemical

Activity	Additional activity notes	Evaluation distance (metres)	Description of typical activities and potential <u>air</u> or <u>noise</u> impacts
Chemical storage & warehousing facilities <ul style="list-style-type: none"> Development Regulations, Schedules 21 1(1) & 22 1(1) Environment Protection Act, Schedule 1 1(1) 	Blending/mixing Storage only Note: consideration should be given to storage of incompatible materials which can have a fire or explosive risk (eg hypochlorite and petroleum). Evaluation distances given here do not take these risks into account.	500 100	<p>The main concern related to chemical storage and warehousing facilities is the potential impact to air quality where blending or mixing of chemicals occurs. This potential impact is dependent on the chemicals involved but can result in dust and odour, and in the event of organic chemicals, in the release of volatile organic compounds (VOCs).</p> <p>Noise from forklifts, trucks and the loading and handling of materials can also cause concerns.</p> <p>Note: Blending or mixing of chemicals resulting in chemical reactions occurring, where new chemicals are formed, are considered chemical works and requires appropriate consideration under the EP Act.</p>
Chemical works <ul style="list-style-type: none"> Development Regulations, Schedules 21 1(2) & 22 1(2) Environment Protection Act, Schedule 1 1(2) 	Evaluation distance is dependent on the scale of operation and type of chemical/s	Individual assessment	Chemical works are any processes where chemical reactions occur between reagent materials resulting in desired new chemical products. Typically plants are large in scale and result in potential air quality and noise concerns.

Activity	Additional activity notes	Evaluation distance (metres)	Description of typical activities and potential <u>air</u> or <u>noise</u> impacts
Coke works <ul style="list-style-type: none"> Development Regulations, Schedule 22 1(3) Environment Protection Act, Schedule 1 1(3) 		2,000	The production of coke relies on the heating of coal in a reducing atmosphere (the exclusion of oxygen), resulting in the release of volatile organic compounds (VOCs) and polycyclic aromatic hydrocarbons (PAHs). Consequently, the main concern relates to air quality from atmospheric discharges and organic odour.
Oil refineries <ul style="list-style-type: none"> Development Regulations, Schedule 22 1(4) Environment Protection Act, Schedule 1 1(4) 		Individual assessment Recommended minimum distance 1,000	Oil refineries typically undertake the processing of crude oil through distillation (boiling point differences) and cracking (the heating of material resulting in smaller fractions). Air quality impacts including from organic vapours, odour and noise are the main parameters of concern.

Activity	Additional activity notes	Evaluation distance (metres)	Description of typical activities and potential <u>air</u> or <u>noise</u> impacts
Petroleum production, storage or processing works or facilities <ul style="list-style-type: none"> Development Regulations, Schedules 21 1(3) & 22 1(5) Environment Protection Act, Schedule 1 1(5) 	<p>Production/processing</p> <p>Bulk storage</p> <p>Service stations/retail outlets:</p> <ul style="list-style-type: none"> Normal hours of operation 24 hour operation on highways/freeways All other 24-hour operations <p>Note: evaluation distances do not take fire or explosive risks into account.</p>	<p>Individual assessment</p> <p>Recommended minimum distance 1,000</p> <p>Individual assessment</p> <p>Recommended minimum distance 500</p> <p>50</p> <p>100</p> <p>200</p>	<p>Petroleum production and processing includes the separation of the oil/water, oil/water/gas and condensate/water/gas mixtures which are extracted from oil and gas wells. This is primarily a physical process, however chemical additives (ie flocculants) are often used to assist with effective separation. Potential impacts are from odour, volatile organic compounds (VOCs), and noise from equipment.</p> <p>The storage and handling of petroleum products can also result in odour impacts from VOCs.</p> <p>Modern approaches for reducing air emissions involve the installation of vapour recovery systems and floating roofs. However, there is still the potential for residual odour emissions to occur and impact on people in the vicinity.</p> <p>Historically the EPA recommended an evaluation distance of 1,500 m for petroleum production, storage or processing works or facilities as vapour recovery systems and floating roofs were not installed as standard practice.</p> <p>New service stations are required to have vapour recovery systems to minimise the emission of VOCs during the refilling of underground storage tanks from petrol tankers (Stage 1).</p> <p>Noise can be generated by equipment associated with trucks refilling tanks, pumps, as well as transfer points for LPG.</p>
Wood preservation works <ul style="list-style-type: none"> Development Regulations, Schedule 22 1(6) Environment Protection Act, Schedule 1 1(6) 	<p>Manufacture and storage of logs using creosote as preservative</p> <p>Storage only of creosote logs older than 6 weeks</p> <p>Manufacture and/or storage of logs using non-creosote preservative</p>	<p>500</p> <p>200</p> <p>200</p>	<p>Creosote is used as a preservative of wood logs and has a strong antiseptic odour. Consequently, odour is the main impact of concern, and the reduced evaluation distance for storage only reflects the level of risk, where manufacture has a significantly higher level of risk than that of just storage of logs older than 6 weeks.</p>

Manufacturing and mineral processing

Activity	Additional activity notes	Evaluation distance (metres)	Description of typical activities and potential <u>air</u> or <u>noise</u> impacts
Abrasive blasting <ul style="list-style-type: none"> Development Regulations, Schedule 22 2(1) Environment Protection Act, Schedule 1 2(1) 	Blasting in the open: <ul style="list-style-type: none"> Dry abrasive cleaning Wet abrasive cleaning Blast cleaning cabinets greater than 5 m ³ in volume Blast cleaning cabinets up to but not exceeding 5 m ³ in volume or totally enclosed automatic blast cleaning units	500 300 100 50	<p>Abrasive blasting involving the use of abrasive medium to remove unwanted surface materials or in surface preparation can be carried out using wet and dry methods, inside or outside, with dust the main air quality concern. The drier the method, the greater the potential for dust to be created.</p> <p>All abrasive blasting must be carried out in a room or cabinet constructed to contain the emission of particulate matter (generally dust). The blast room or cabinet must be totally enclosed, and vented to the atmosphere through an effective dust collector, preferably a fabric filter or paper cartridge.</p> <p>Open air blasting is only permissible subject to the consent of the EPA, when the object is too large or too heavy to fit in a booth, or is a fixed structure.</p> <p>There are also concerns over noise generated from such activities. Cabinets provide a better method of noise control.</p> <p>Note: Short-term blasting operations, such as bridge maintenance, may need specialised controls to manage impacts and will require specific approvals. The EPA would also recommend that a communications plan be in place to advise neighbours of likely timing and duration of this type of work and mitigating controls to manage adverse impacts.</p>
Hot mix asphalt preparation <ul style="list-style-type: none"> Development Regulations, Schedule 22 2(2) Environment Protection Act, Schedule 1 2(2) 	New technology Old technology (applicable to new residential development proposed in the vicinity of existing industry)	500 1,000	<p>Typical asphalt plants now provide a method of direct truck delivery and have gas reclaim systems to ensure odour emission rates are significantly lower than older plants. Odour is a main concern, where the odours are usually aliphatic organic chemicals.</p> <p>There are also concerns with dust generated from truck and forklift movements, the storage and handling of raw material, and where bitumen reclamation occurs. These also have an inherent noise impact.</p>

Activity	Additional activity notes	Evaluation distance (metres)	Description of typical activities and potential <u>air</u> or <u>noise</u> impacts
Cement works <ul style="list-style-type: none"> Development Regulations, Schedule 22 2(3) Environment Protection Act, Schedule 1 2(3) 		1,000	<p>Cement works are typically large plants that process raw materials such as lime and fly ash through milling and heating to produce a cementitious product.</p> <p>The main impacts are from dust and fine particles, which are typically alkaline in nature, and noise from operations such as milling.</p>
Ceramic works <ul style="list-style-type: none"> Development Regulations, Schedules 21 2(1) & 22 2(4) Environment Protection Act, Schedule 1 2(4) 		750	<p>Fluoride emissions from ceramic works may pose a risk of damage to vegetation and animal health at levels lower than those required to impact on human health.</p> <p>Due to the high temperatures used, odour can also be a potential concern.</p> <p>Fugitive dust may result from material handling operations.</p>

Activity	Additional activity notes	Evaluation distance (metres)	Description of typical activities and potential <u>air</u> or <u>noise</u> impacts
Concrete batching works <ul style="list-style-type: none"> • Development Regulations, Schedule 22 2(5) • Environment Protection Act, Schedule 1 2(5) 		200	<p>Dust generation at concrete batching facilities usually results from vehicle movements on unsealed working areas, disturbance by vehicles of cement and aggregate dust on the ground, blow-outs from cement storage silos, and vehicle loading and unloading. Further, dust issues off-site can arise if mud or cement and aggregate dust is dragged by trucks from the site and dries on the adjoining roadway.</p> <p>There is potential for dust generation with delivery of sand and aggregates, cement and fly ash (a cementitious material used to enhance the quality of concrete and similar to cement), loading of the aggregate weigh-hoppers, and loading of the trucks.</p> <p>Concrete batching works are reasonably noisy and commonly operate in the early hours of the morning (prior to 7 am) so that concrete can be poured before the ambient daytime temperature warms.</p> <p>Sources of noise may include loading/unloading of materials, associated vehicle movements (including reversing beepers), the vibration of the concrete agitator and general machine noise from the plant.</p>
Drum reconditioning <ul style="list-style-type: none"> • Development Regulations, Schedule 22 2(6) • Environment Protection Act, Schedule 1 2(6) 		100	<p>The main potential impacts from drum reconditioning relate to odour and noise. Drums are commonly put through a wash booth that removes contaminants with high pressure water. Washing is usually done with hot water, and steam and wash waters can cause odour depending on what the drum contained. Paint odours may also be present as the reconditioned drums are usually spray painted.</p> <p>Noise impacts are usually associated with the nature of the drums being mostly steel. Loading and unloading activities create noise as well as the washing. Lids are often cut off with grinders and drums are commonly crushed if unable to be reconditioned potentially causing noise impacts.</p>

Activity	Additional activity notes	Evaluation distance (metres)	Description of typical activities and potential <u>air</u> or <u>noise</u> impacts
Ferrous and non-ferrous metal melting (eg foundries) <ul style="list-style-type: none"> Development Regulations, Schedules 21 2(2) & 22 2(7) Environment Protection Act, Schedule 1 2(7) 	Sand casting: <ul style="list-style-type: none"> More than 500 kg/cycle Up to but not exceeding 500 kg/cycle Diecasting (no resin sand)	1,000 500 100	<p>The main potential impact from metal casting facilities relates to the binder in casting sand. Typically these are phenolic resins, but other organic binders such as furfuryl alcohol are also used, and on application of molten metals and subsequent breaking of moulds releases volatile organic compounds. Consequently, impact to the air environment of odours and benzene are typical.</p> <p>Dust and noise also pose potential environmental impacts.</p>
Metallurgical works (eg smelters) <ul style="list-style-type: none"> Development Regulations, Schedule 22 2(8) Environment Protection Act, Schedule 1 2(8) 		Individual assessment	<p>Smelters and other metallurgical works are typically large, complex industrial plants, where the most significant impacts are dust (fine particles, nuisance particles) as well as metals dust, odour, sulfur oxides and noise.</p>
Mineral works <ul style="list-style-type: none"> Development Regulations, Schedule 22 2(9) Environment Protection Act, Schedule 1 2(9) 		Individual assessment	<p>Mineral works includes the physical processing of ores, sands or earths to produce concentrates without any chemical reactions. Examples include floatation and screening.</p> <p>Odour, dust and noise are potential impacts.</p>

Activity	Additional activity notes	Evaluation distance (metres)	Description of typical activities and potential <u>air</u> or <u>noise</u> impacts
Pulp or paper works <ul style="list-style-type: none"> Development Regulations, Schedules 21 2(3) & 22 2(10) Environment Protection Act, Schedule 1 2(10) 		Individual assessment (1,000–2,000 depending on process and scale)	<p>The impacts of pulp or paper works varies depending on the process used, but can include the emission of air pollutants which can be odorous and also hazardous to human health.</p> <p>In chemical pulping, the cooking process results in emissions of a variety of hazardous air pollutants including formaldehyde, methanol, acetaldehyde and other VOCs.</p> <p>The washing process also generates a large volume of exhaust gases containing hazardous air pollutants. The liquid which results from the washing process is generally chemically recovered. The recovery process also results in emission of hazardous VOCs.</p> <p>In the pulp bleaching process, vents from the bleaching tanks emit hazardous VOCs including chloroform and methanol. Toxic chemicals (such as dioxins, furans) can also be generated from the liquid waste stream due to the mixture of the chemicals. Air emissions are generally controlled through cleaner production methods and manufacturing process improvements.</p> <p>Large amounts of wastewater are generated (due to the high water usage) which have the potential to create odours.</p> <p>Noise from machinery operations is also a potential impact.</p>
Scrap metal recovery <ul style="list-style-type: none"> Development Regulations, Schedule 22 2(11) Environment Protection Act, Schedule 1 2(11) 		500	<p>Involves works at which scrap metals are treated in any type of fuel-burning equipment or electrically heated furnaces generating odours, or are disintegrated by mechanical means for the recovery of metal, generating noise and dust.</p>

Activity	Additional activity notes	Evaluation distance (metres)	Description of typical activities and potential <u>air</u> or <u>noise</u> impacts
Surface coating <ul style="list-style-type: none"> Development Regulations, Schedules 21 2(4) & 22 2(12)(a) Environment Protection Act, Schedule 1 2(12)(a) 	Commercial electroplating, electrolyse plating, anodising (chromating, phosphating and colouring), chemical etching or milling, or printed circuit board manufacture	200	Surface coating is related to the treatment of material surfaces. All such treatments are chemical in nature and, as such, may have an air quality impact. Impacts relate to the liquids used, including heating of these liquids in some cases, liberating acidic gases or aerosols.
Surface coating <ul style="list-style-type: none"> Development Regulations, Schedule 22 2(12)(b) Environment Protection Act, Schedule 1 2(12)(b) 	Hot dip galvanising	400	<p>Galvanisation is the process of applying zinc to metal resulting in a protective zinc coating to prevent rusting. Historically this process involved the application of zinc by galvanic cell (electroplating) but the most common method these days is the total submersion of the item in molten zinc, resulting in a much thicker and durable zinc coating.</p> <p>The main potential impacts are dust containing zinc and its compounds, and odour.</p>

Activity	Additional activity notes	Evaluation distance (metres)	Description of typical activities and potential <u>air</u> or <u>noise</u> impacts
Surface coating <ul style="list-style-type: none"> Development Regulations, Schedule 22 2(12)(c) Environment Protection Act, Schedule 1 2(12)(c) 	<p>Spray painting and powder coating with a capacity to use more than 100 litres/day of paint or 10 kg/day of dry powder</p> <p>Spray painting and powder coating with a capacity to use up to but not exceeding 100 litres/day of paint or 10 kg/day of dry powder</p>	<p>300</p> <p>100</p>	<p>Spray painting and powder coating involve the application of protective material on surfaces. Spray painting typically requires solvents to evaporate, usually organic volatiles, although now more water-based paints are being used. Powder coating includes the spraying of powder onto surfaces and curing in an oven.</p> <p>Solvent emissions include gaseous reaction products such as formaldehyde during drying and curing, and isocyanates. These emissions can cause odour nuisance and may also impact on human health.</p> <p>Dry application can result in powder coating fallout of paint particles or powder over-spray, and powder recovery system, in which case fabric filters should be used.</p> <p>The main potential air quality impacts are dust, volatile organics and odour. Noise can also be an impact from mechanical equipment including spray booths, ventilation fans, compressors and pumps. Noise from material handling and traffic movements should also be a consideration.</p>
Wood processing works <ul style="list-style-type: none"> Development Regulations, Schedule 22 2(13) Environment Protection Act, Schedule 1 2(13) 	<p>Sawing, milling, chipping, debarking and hogging</p> <p>Joinery operations</p>	<p>500</p> <p>100</p>	<p>Impacts of wood processing works include noise generated by the plant and machinery including saws, planers, debarking and moulding machinery, and fallout of dust from extraction systems.</p>

Activity	Additional activity notes	Evaluation distance (metres)	Description of typical activities and potential <u>air</u> or <u>noise</u> impacts
Maritime construction works <ul style="list-style-type: none"> • Development Regulations, Schedule 22 2(14) • Environment Protection Act, Schedule 1 2(14) 		300	Dry dock construction or repair of sea vessels can result in noise, welding fumes and dust.
Vehicle production <ul style="list-style-type: none"> • Development Regulations, Schedules 21 2(5) & 22 2(15) • Environment Protection Act, Schedule 1 2(15) 	<p>More than 100 motor vehicles/year</p> <p>Up to but not exceeding 100 motor vehicles/year</p>	<p>500</p> <p>100</p>	Car manufacturing is complex and includes elements such as fabrication, assembly, and spray painting, and as such noise, dust and odour are often generated.

Waste treatment and disposal

Activity	Additional activity notes	Evaluation distance (metres)	Description of typical activities and potential <u>air</u> or <u>noise</u> impacts
Incineration <ul style="list-style-type: none"> Development Regulations, Schedule 22 3(1) Environment Protection Act, Schedule 1 3(1) 	Destruction of chemical wastes Destruction of medical wastes Cremation Solid municipal waste	1,000 500 150 500	Impacts most likely relate to smoke and odour. BATEA includes afterburners, scrubbers, emission stacks and particulate detection probes.
Wastewater treatment plants (WWTPs) <ul style="list-style-type: none"> Development Regulations, Schedules 21 3(2) & 22 3(2) Environment Protection Act, Schedule 1 3(2) 	Mechanical wastewater plants (including aerated lagoons): <ul style="list-style-type: none"> <1,000 equivalent persons (EP) >1,000 and <5,000 EP >5,000 and <15,000 EP >15,000 EP. Treatment lagoons (non-mechanical): <ul style="list-style-type: none"> <1,000 equivalent persons (EP) >1,000 and <5,000 EP >5,000 and <15,000 EP >15,000 EP. 	100 200 300 Individual assessment 150 350 700 Individual assessment	Mechanical treatment and aeration reduces the potential for off-site odour impacts compared to non-mechanical treatment lagoons. However, regular pumping and maintenance activities may produce short-term odour events. Within a mechanical treatment plant, noise may originate from aeration equipment (eg blowers and pumps), and truck operations relating to tank pumping and maintenance. There is no recommended evaluation distance for recycled water storage lagoons, so a site-specific assessment is recommended.

Activity	Additional activity notes	Evaluation distance (metres)	Description of typical activities and potential <u>air</u> or <u>noise</u> impacts
Biosolids depot <ul style="list-style-type: none"> Development Regulations, Schedule 22 3(3) Environment Protection Act, Schedule 1 3(3) 	Biosolids stockpiling/processing depot	400	<p>Odour is the primary impact of a biosolids depot, where sludges are dried, treated, processed and/or stockpiled. The spreading of biosolids on land (see Biosolids and septage spreading) can also have an odour impact, however the environmental risk is higher for a depot because of the larger quantities involved.</p> <p>For further information refer to Draft South Australian biosolids guidelines for the safe handling and reuse of biosolids.</p>
Waste or recycling depots <ul style="list-style-type: none"> Development Regulations, Schedule 22 3(3) Environment Protection Act, Schedule 1 3(3) 	<p>Landfill</p> <p>Other (eg transfer stations, resource recovery facilities)</p> <p>Not licenced in accordance with Schedule 1 of the EP Act (does not include residential/domestic premises)</p>	<p>500</p> <p>300</p> <p>100</p>	<p>Operations at waste and recycling depots can have a number of air quality (typically odour and dust) and noise impacts.</p> <p>Landfill gas is generated by decomposing material in landfills and includes methane, carbon dioxide and other trace gases. Some components of landfill gas can cause odour impacts.</p> <p>Particular processes such as composting or general hold times for wastes at transfer stations can also cause odour issues.</p> <p>Dust can also be an issue and is generated by vehicle movements, dusty waste and soil stockpiles.</p> <p>Noise is also a potential impact from the collection, transport, sorting and transfer of materials, processing equipment or site machinery and traffic.</p> <p>For further information refer to Landfill gas and development near landfills – advice for planning authorities and developers and Guidelines for environmental management of landfill facilities (municipal solid waste and commercial and industrial general waste).</p>

Animal husbandry, aquaculture and other activities

Activity	Additional activity notes	Evaluation distance (metres)	Description of typical activities and potential <u>air</u> or <u>noise</u> impacts
Cattle feedlots <ul style="list-style-type: none"> Development Regulations, Schedule 22 5(1) Environment Protection Act, Schedule 1 5(1) 	Beef cattle	See: National guidelines for beef cattle feedlots in Australia	<p>A cattle feedlot is a confined yard area with watering and feeding facilities where beef cattle are hand or mechanically fed for beef production. The feedlot complex also includes other associated areas and activities including handling yards; areas where wastes (manure and effluent) from the feedlot are stored or treated prior to disposal or removal; wash-down facilities and areas where feed is stored, handled or prepared.</p> <p>Evaluation distances are mainly designed to prevent nuisance odour impacting on neighbouring sensitive receptors, however noise and dust may also be an issue. Odour is produced by the biological decomposition of manure, spilt feed and other organic matter. There are a number of odour sources including feedlot pens, handling yards, effluent treatment systems, and composting or manure stockpile pads. Dust sources include the movement of cattle or vehicles (light and heavy vehicles), and dust from stockpiled material or on pen/yard surfaces which gets blown around by the wind particularly during the drier months.</p> <p>Noise may arise from stock handling activities, vehicle movements including feed trucks and stock transports, feed milling and handling, and other plant or equipment used at the site.</p>
Fish farming (land-based aquaculture) <ul style="list-style-type: none"> Development Regulations, Schedule 22 5(2) 	Pond culture Recirculating aquaculture systems (RAS – tanks in sheds) Pump-ashore (coastal flow through)	100 150 200	<p>Noise from land-based aquaculture activities generally comes from the operation of equipment such as pumps, aerators and filters, and to a lesser extent from vehicles.</p> <p>On-site power generators are also a potential source of noise which needs to be considered (see Diesel fuel power generators). For the majority of farms, generators are only likely to be used as a backup power source in the event of a power failure.</p> <p>Odour is the other potential impact of fish farming and can be due to mortality pits, composting facilities, waste disposal and wastewater treatment systems (eg settlement ponds, sump tanks).</p>

Activity	Additional activity notes	Evaluation distance (metres)	Description of typical activities and potential <u>air</u> or <u>noise</u> impacts
Saleyards <ul style="list-style-type: none"> Development Regulations, Schedule 22 5(3) Environment Protection Act, Schedule 1 5(3) 	<p>Throughput >50 000 sheep equivalent units per year</p> <p>Sheep equivalent units: 1 sheep or goat = 1 unit 1 pig (<40 kg) = 1 unit 1 pig (>40 kg) = 4 units 1 cattle (<40 kg) = 3 units 1 cattle (40–400 kg) = 6 units 1 cattle (>400 kg) = 8 units</p> <p>Throughput >25,000 but <50,000 sheep equivalent units per year</p>	<p>Individual assessment</p> <p>200</p>	<p>Saleyards are where sheep, cattle, pigs or other animals are gathered or confined for commercial sale, auction or exchange, and includes the associated transport loading facilities.</p> <p>Environmental impacts of saleyards include noise, dust and odour. Odour can come from waste disposal and wastewater treatment systems, and dust from stock and vehicle movements.</p> <p>Noise from vehicle movements, stock and loudspeaker systems can also have impacts.</p>
Piggeries <ul style="list-style-type: none"> Development Regulations, Schedules 21 4(1) & 22 5(4) Environment Protection Act, Schedule 1 5(4) 		<p>See: National Environmental Guidelines for Piggeries</p> <p>or</p> <p>National Environmental Guidelines for Rotational Outdoor Piggeries</p>	<p>Intensive piggery operations (either indoor or outdoor) are where pigs are fed for the purpose of production, relying mostly on prepared or manufactured feedstuffs. The piggery complex includes housing, yarding and loading areas, waste and effluent accumulation and treatment areas, food preparation and storage areas, and maintenance areas.</p> <p>Odour will generally be the greatest concern, however dust and noise may also impact on neighbouring sensitive receptors. Odour (mainly due to the biological decomposition of manure, spilt feed and organic matter) comes from a number of sources including the collection, storage and treatment of effluent, storing and processing solid wastes, from production sheds housing pigs and the application of effluent or solids to land.</p> <p>Dust can arise from many operations including vehicle movements particularly on unsealed roads, the handling or reuse of solid byproducts, feed preparation and handling (eg milling), and sheds.</p> <p>Noise emissions can arise from the piggery itself, plant and machinery used at the site, and vehicle movements (including trucks).</p>

Activity	Additional activity notes	Evaluation distance (metres)	Description of typical activities and potential <u>air</u> or <u>noise</u> impacts
Dairies <ul style="list-style-type: none"> Development Regulations, Schedule 21 4(2) 	<p>More than 100 milking cows/sheep/goats at any one time</p> <p>Total site including dairy, raceway, lagoon and any confined feeding areas.</p>	500	<p>Dairy farms, like other livestock industry activities, can potentially have a number of environmental impacts including odour, dust and noise.</p> <p>Odour can come from a number of sources including waste and wastewater storage or treatment areas, feed and feed storage areas, buildings/sheds and holding yards, and the animals themselves.</p> <p>Noise arises as a result of dairy operations, including the use of vehicles (farm/domestic and transport vehicles), machinery and other equipment and the animals.</p> <p>Dust can come from the movement of stock, vehicles or machinery.</p>
Poultry farms <ul style="list-style-type: none"> Development Regulations, Schedule 21 4(3) 	<p>Up to 500,000 birds</p> <p>More than 500,000 birds (for individual farm or industry precinct)</p>	<p>See: Appendix 2</p> <p>Odour modelling assessment</p>	<p>Odour is the main impact and is the result of anaerobic decomposition of manure, spilt feed and other organic matter. Birds and bird respiration can also add to the odour impact. High moisture content in the litter and wet feathers can exacerbate odour issues.</p> <p>Clusters of poultry sheds or farms can have a cumulative impact and as a result a site-specific assessment may be required, including odour modelling.</p> <p>Certain meteorological effects, for example katabatic drainage (cold air drainage), can also exacerbate odour issues.</p> <p>Dust from transport activities and ventilation systems (where the birds, feed and litter inside sheds are sources), particularly during bird collection and shed clean-outs, as well as noise from vehicle movements (including trucks and tractors), equipment, farm operations and the birds themselves are other potential impacts.</p> <p>The evaluation distances determined using the formula in Appendix 2 do not take into consideration the separation required for biosecurity purposes. Refer to relevant agencies for further information.</p>

Food production and animal & plant product processing

Activity	Additional activity notes	Evaluation distance (metres)	Description of typical activities and potential <u>air</u> or <u>noise</u> impacts
Abattoirs, slaughterhouses or poultry processing works <ul style="list-style-type: none"> Development Regulations, Schedules 21 5(1) & 22 6(1) Environment Protection Act, Schedule 1 6(1) 	<p>Other than poultry with a rate of production:</p> <ul style="list-style-type: none"> >1,000 tonnes/year >100 tonnes/year and <1,000 tonnes/year <p>Poultry only with a rate of production:</p> <ul style="list-style-type: none"> >1,000 tonnes/year >200 tonnes/year and <1,000 tonnes/year <p>With rendering plant</p>	<p>1,000</p> <p>500</p> <p>1,000</p> <p>300</p> <p>1,000</p>	<p>The major impact of abattoirs is odour and there are a number of different potential sources. Sources include waste disposal, effluent treatment, cooking and rendering processes, slaughterhouses and animal-holding areas. The use of odour control equipment or measures will help to minimise odour nuisance at nearby sensitive receptors.</p> <p>Odour modelling is recommended for operations that include pond storage of more than 5 ML, where rate of production is greater than 500 tonnes/year and where there are more than five residences within 1 km.</p> <p>Note: there may be a greater potential for odour impacts during the start-up and commissioning phase compared to normal operations.</p> <p>Dust from unsealed roads, paddocks, holding areas, stockpiled materials and emissions from fuel burning can also impact on air quality.</p> <p>Noise from animals, vehicles (including truck and forklifts), equipment and machinery may also have an impact, noting that some equipment may operate 24 hours a day.</p>
Breweries <ul style="list-style-type: none"> Development Regulations, Schedules 21 5(2) & 22 6(2) Environment Protection Act, Schedule 1 6(2) 	<p>Production capacity >5,000 litres/day</p> <p>Production capacity >2,000 litres/day and <5,000 litres/day</p> <p>Production capacity <2,000 litres/day, eg micro/boutique breweries</p>	<p>1,000</p> <p>500</p> <p>250</p>	<p>Odour and noise are the main potential impacts associated with breweries. Odours are generally due to emissions released during boiling and fermentation stages of the process, particularly volatile organic compounds. Wastewater can also be a source of odour.</p> <p>The use of vapour recovery systems, such as condensers which discharge the condensate as licensed trade waste can significantly reduce the potential for odour impacts.</p> <p>Potential sources of noise are vehicle movements including forklifts and heavy vehicles, loading and unloading activities as well as mechanical plant.</p>

Activity	Additional activity notes	Evaluation distance (metres)	Description of typical activities and potential <u>air</u> or <u>noise</u> impacts
Composting works <ul style="list-style-type: none"> Development Regulations, Schedule 22 6(3) Environment Protection Act, Schedule 1 6(3) 	>200 tonnes/year >20 and <200 tonnes/year <20 tonnes/year	1,000 300 100	<p>Impacts on air quality are the primary factor to consider with composting facilities. The potential for odour is influenced by the type and condition of the organic waste received and the composting method used. Potential sources of odour are windrows and lagoons.</p> <p>Dust can also be produced as part of composting works, eg from vehicle movements, windrow formation and turning, screening, stockpiling, loading and transport.</p> <p>Noise from machinery and equipment as well as vehicles (including trucks) is also a potential impact although to a lesser extent. Noise is generally not an issue beyond the distance required to account for air quality impacts.</p> <p>For further information refer to the Compost guideline.</p>
Fish processing <ul style="list-style-type: none"> Development Regulations, Schedule 22 6(4) Environment Protection Act, Schedule 1 6(4) 	Processing output more than 100 tonnes/year Processing output up to but not exceeding 100 tonnes/year	200 100	<p>Odour may be associated with the receiving, processing and storing of fish, waste disposal, wastewater treatment and cooking/smoking/drying processes.</p> <p>Noise from vehicles (including heavy vehicles and forklifts), refrigeration units and other mechanical plant can also potentially impact on sensitive receptors.</p>
Milk processing works <ul style="list-style-type: none"> Development Regulations, Schedules 21 5(3) & 22 6(5) Environment Protection Act, Schedule 1 6(5) 	Processing capacity of more than 5 ML/year Processing capacity up to but not exceeding 5 ML/year	500 100	<p>The main impacts of milk processing works are odour and noise. The main source of odour is the treatment or storage of wastewater and is due to the biological decomposition of organic matter.</p> <p>Noise sources include mechanical plant, eg dryers, fans, boilers, pumps, refrigeration units and aerators as well as heavy vehicle movements and noise from compressors on refrigerated trucks.</p>

Activity	Additional activity notes	Evaluation distance (metres)	Description of typical activities and potential <u>air</u> or <u>noise</u> impacts
Produce processing works <ul style="list-style-type: none"> Development Regulation, Schedules 21 5(4)(a) & 22 6(6)(a) Environment Protection Act, Schedule 1 6(6)(a) 	Deep fat frying, roasting or drying: <ul style="list-style-type: none"> Processing capacity more than 30 kg/hour Processing capacity up to but not exceeding 30 kg/hour 	200 150	Processing agricultural crop material by deep fat frying, roasting or drying can cause nuisance odour and dust issues. Odour issues can arise when the product is heated, and dust when the product undergoes the preparation stages.
Produce processing works <ul style="list-style-type: none"> Development Regulations, Schedules 21 5(4)(b) & 22 6(6)(b) Environment Protection Act, Schedule 1 6(6)(b) 	Agricultural crop material where: <ul style="list-style-type: none"> more than 10 ML/year of wastewater is generated up to but not exceeding 10 ML/year of wastewater is generated 	300 200	Odour arises mainly from associated irrigation of wastewater with a high biological oxygen demand (BOD), the storage of wastewater and storage and/or composting of solid wastes. Noise can be attributed to refrigeration systems, crushers, forklifts, and trucks unloading and loading finished product. This will vary depending on the type of production and scale.
Rendering or fat extraction works <ul style="list-style-type: none"> Development Regulations, Schedules 21 5(5) & 22 6(7) Environment Protection Act, Schedule 1 6(7) 		1,000	Odour is the main potential impact and is produced during the rendering process, including from the cooker, press, screw conveyor, meal screening and the receiving and handling of raw materials. It can also come from wastewater treatment systems. The use of odour removal technologies is effective at reducing the odour impact of rendering and fat extraction works.

Activity	Additional activity notes	Evaluation distance (metres)	Description of typical activities and potential <u>air</u> or <u>noise</u> impacts
Curing or drying works <ul style="list-style-type: none"> Development Regulations, Schedules 21 5(6) & 22 6(8) Environment Protection Act, Schedule 1 6(8) 	Processing capacity: <ul style="list-style-type: none"> More than 250 kg/hour Up to but not exceeding 250 kg/hour 	500 200	Curing and drying works can cause nuisance odour and smoke issues when the product is smoked. Odour issues can also occur through poor waste byproduct management.
Tanneries or fellmongeries <ul style="list-style-type: none"> Development Regulations, Schedule 22 6(9) Environment Protection Act, Schedule 1 6(9) 		1,000	The wastewater treatment processes used at tanneries can potentially cause odour issues. Generally odour is caused by the biological decomposition of organic matter under anaerobic conditions. Sulphide and ammonia emissions from wastewater and solvent or other emissions from finishing can also occur.
Woolscouring or wool carbonising works <ul style="list-style-type: none"> Development Regulations, Schedule 22 6(10) Environment Protection Act, Schedule 1 6(10) 		1,000	Wool scouring and carbonising involves washing wool to remove grease and dust, and using acid to remove vegetable matter from scoured wool respectively. The treatment, storage and disposal of the wastewater/effluent produced by wool scouring and carbonising activities have the potential to cause odour impacts for sensitive receptors, particularly if storage ponds are allowed to turn anaerobic.

Activity	Additional activity notes	Evaluation distance (metres)	Description of typical activities and potential <u>air</u> or <u>noise</u> impacts
Wineries or distilleries <ul style="list-style-type: none"> Development Regulations, Schedules 21 5(7) & 22 6(11) Environment Protection Act, Schedule 1 6(11) 	Mechanically treated wastewater (including the use of aeration devices)	300	<p>Odours and air emissions can result from the storage and management of raw materials, byproducts from the winemaking process and wastewater. Anaerobic decomposition of organic matter and solids produces odour, which can cause nuisance.</p> <p>Winery equipment such as pumps, chillers and crushers can be a source of noise at wineries and distilleries. Vehicles can also be a source of noise as well as dust, particularly during vintage. Deliveries at night time can increase the potential for annoyance.</p>
	Wastewater storage lagoons without any aeration device:		
	<ul style="list-style-type: none"> BOD >4,000 mg/l 	1,000	
	<ul style="list-style-type: none"> BOD >1,000 and <4,000 mg/l 	750	
	<ul style="list-style-type: none"> BOD >100 and <1,000 mg/l 	500	
	<ul style="list-style-type: none"> BOD <100 mg/l Bottling only. 	300	

Materials handling and transportation

Activity	Additional activity notes	Evaluation distance (metres)	Description of typical activities and potential <u>air</u> or <u>noise</u> impacts
Bulk storage and shipping facilities <ul style="list-style-type: none"> Development Regulations, Schedules 21 6(1) & 22 7(1) Environment Protection Act, Schedule 1 7(1) 		300	<p>This involves the bulk handling of agricultural crop products, rock, ores, minerals, petroleum products or chemicals at a wharf or wharfside facility such as a sea port grain terminal.</p> <p>Likely impacts of dust from products being shipped, noise from on-site operations and traffic movements of rail or trucking extending beyond the site.</p>
Railway operations <ul style="list-style-type: none"> Development Regulations, Schedule 22 7(2) Environment Protection Act, Schedule 1 7(2) 		See: Guidelines for the assessment of noise from rail infrastructure	<p>Railway operations can result in dust, noise and vibration impacts.</p> <p>Reference can also be made to Reducing noise and air impacts from road, rail and mixed land use – A guide for builders, designers and the community and Minister's Specification SA 78B Construction requirements for the control of external sound.</p>
Crushing, grinding or milling <ul style="list-style-type: none"> Development Regulations, Schedules 21 6(2)(a) & 22 7(3)(a) Environment Protection Act, Schedule 1 7(3)(a) 	Chemicals or rubber: <ul style="list-style-type: none"> odorous non-odorous 	500 300	<p>Some chemicals and rubber materials require physical processing such as grinding (to pulverise) and milling (to homogenise consistent texture). Some of these chemicals and rubber are odorous.</p> <p>Crushing, grinding and milling chemicals and rubber can also result in dust and noise.</p>

Activity	Additional activity notes	Evaluation distance (metres)	Description of typical activities and potential <u>air</u> or <u>noise</u> impacts
Crushing, grinding or milling <ul style="list-style-type: none"> Development Regulations, Schedules 21 6(2)(b) & 22 7(3)(b) Environment Protection Act, Schedule 1 7(3)(b) 	Agricultural crop products	300	<p>Dust emissions from processing may cause an impact. Odour impacts mainly relate to wastewater storage/irrigation, waste product produced as part of the processing, and on-site storage/composting of these wastes.</p> <p>Noise from exhaust fans, crushing machinery and vehicular movements have the potential to cause impacts dependant on the scale of the operations.</p>
Crushing, grinding or milling <ul style="list-style-type: none"> Development Regulations, Schedules 21 6(2)(c) & 22 7(3)(c) Environment Protection Act, Schedule 1 7(3)(c) 	Rock, ores or minerals	500	<p>Potential sources of dust generation include the delivery of bulk material to the property, the movement of material, crushing of material, and transfer to and from trucks. Potential adverse climatic conditions could also generate off-site dust impacts</p> <p>Potential sources of noise include handling of raw materials and finished product, vehicle movements, hopper vibration and noise from the crushing, grinding and milling plants. Other on-site activities may also produce minor additions to background noise levels.</p>
Dredging <ul style="list-style-type: none"> Development Regulations, Schedule 22 7(4) Environment Protection Act, Schedule 1 7(4) 	Excluding works carried out for the establishment of a visual aid to navigation and any lawful fishing or recreational activity	300	<p>Typically involves the removal of material either by excavation or by suction dredging. Dredging may be undertaken 24 hours per day.</p> <p>At the dredging site there will likely be noise and odour issues. The dredging spoil will require either disposal or dewatering prior to disposal, and this may generate odours. This may occur adjacent to the dredging site or some distance from it, and so impacts from the dredging and spoil management need separate consideration.</p>

Activity	Additional activity notes	Evaluation distance (metres)	Description of typical activities and potential <u>air</u> or <u>noise</u> impacts
Coal handling and storage <ul style="list-style-type: none"> Development Regulations, Schedules 21 6(4) & 22 7(5) Environment Protection Act, Schedule 1 7(5) 	<p>Handling capacity greater than 1 tonne per day or a storage capacity greater than 50 tonnes.</p> <p>Handling capacity up to 1 tonne per day or a storage capacity up to 50 tonnes.</p>	<p>1,000</p> <p>500</p>	Coal can easily be broken down to finer particles during handling and in transit, posing a risk of dust emissions.
Earthworks drainage <ul style="list-style-type: none"> Development Regulations, Schedule 22 7(6) Environment Protection Act, Schedule 1 7(6) 		300	Main concern is odour, however pump noise should be considered, particularly since operations may run 24 hours a day.
Extractive industries <ul style="list-style-type: none"> Development Regulations, Schedule 22 7(7) Environment Protection Act, Schedule 1 7(7) 		Individual assessment	The main concerns are noise and dust, which are generated at sites from excavation areas, haul roads, raw feed and product stockpiles, processing and screening plants, blasting, rock crushers, mobile screening plants, crushing, grinding and milling.

Other

Activity	Additional activity notes	Evaluation distance (metres)	Description of typical activities and potential <u>air</u> or <u>noise</u> impacts
Aerodromes <ul style="list-style-type: none"> Development Regulations, Schedule 22 8(1) Environment Protection Act, Schedule 1 8(1) 		Individual assessment	<p>Aerodromes include airfields and airports of all sizes used for commercial or charter aircraft take-off and/or landing, ranging from small airfields used for flight training or 'joy flights', up to large international airports catering for hundreds of commercial flights per day.</p> <p>The primary off-site impact from operation of aerodromes relates to noise from aircraft take-offs and landings. Ancillary activities at the airfield (such as maintenance) may also have an off-site impact and should be considered. Aircraft flyovers not related to take-off or landing at an aerodrome cannot be attributed to any specific aerodrome, and as such should not be considered.</p>
Fuel burning <ul style="list-style-type: none"> Development Regulations, Schedules 21 7(1) & 22 8(2); Environment Protection Act, Schedule 1 8(2) 		Individual assessment	<p>The main concern for fuel burning is the potential impact to air quality, mainly from oxides of nitrogen (NO_x) and particulates. This potential impact depends on emission controls and the type of fuel used. In the case of power generators, it also depends on whether the station is 'base load' or 'peaking', and the generation capacity.</p> <p>The use of fuel burning equipment to cure, bake or dry materials can result in emissions to air which are in addition to those resulting from the burning of fuel, and are dependent on the material being heated.</p> <p>Potential sources of noise include fans, pumps, turbines/generators, combustion exhausts (gas turbines), steam admissions/discharges, fuel handling operations and electrical transformers.</p>

Activity	Additional activity notes	Evaluation distance (metres)	Description of typical activities and potential <u>air</u> or <u>noise</u> impacts
Helicopter landing facilities <ul style="list-style-type: none"> • Development Regulations, Schedule 22 8(3) • Environment Protection Act, Schedule 1 8(3) 		Individual assessment	<p>Noise is the main impact associated with helicopter landing facilities, and arises from helicopter take-offs and landings. Care should be taken when selecting the location of the pad to minimise off-site impacts as much as possible. Helicopter flyovers not related to take-off or landing at the facility are not considered by the EPA when assessing applications.</p> <p>In some cases, such as emergency landing facilities, there may be some noise disturbance to local communities late at night and early in the morning. However the community benefit far outweighs the short-term inconvenience resulting from noise impacts.</p> <p>Normally refuelling is not carried out at such facilities and is not a consideration. Past experience has found that the number of events is generally low and infrequent. Where there is frequent use of the pad a full assessment is required to ensure impacts are minimised.</p>
Marinas and boating facilities: mooring or storage <ul style="list-style-type: none"> • Development Regulations, Schedules 21 7(2) & 22 8(4)(a) • Environment Protection Act, Schedule 1 8(4)(a) 		200	<p>This activity covers a number of aspects of boat storage including dock boat yards, marinas, moorings, boat and yacht clubs, and boat storage sheds on land. Impacts will vary depending on the type of operation. Likely impacts are noise from boats, and potential odour from fuels and organic material.</p>

Activity	Additional activity notes	Evaluation distance (metres)	Description of typical activities and potential <u>air</u> or <u>noise</u> impacts
Marinas and boating facilities: repair or maintenance <ul style="list-style-type: none"> Development Regulations, Schedule 22 8(4)(b) Environment Protection Act, Schedule 1 8(4)(b) 		300	<p>This includes slipways, launch facilities and hard stand areas near storage facilities. The operations may include abrasive blasting, painting, and mechanical repair. Likely impacts are noise, dust and odour.</p>
Motor racing or testing venues <ul style="list-style-type: none"> Development Regulations, Schedule 22 8(5) Environment Protection Act, Schedule 1 8(5) 		Individual assessment	<p>This includes tarmac and dirt circuits, drag strips, off-road trails and any other facilities designed for racing, practice, competition or trial of motor vehicles, including road-going and off-road vehicles, as well as motorcycles, dirt bikes and quad bikes.</p> <p>Noise from these activities may be highly annoying in nature, as it typically comprises significant modulation, as well as potentially a highly tonal or low frequency character. Noise from such venues typically arises from the vehicles themselves, as well as from public address system noise, and potentially amplified music and patron/spectator noise from larger venues.</p> <p>For off-road or dirt track facilities, off-site migration of dust may also be an issue, depending on the proximity of residences and local meteorological conditions.</p>
Shooting ranges <ul style="list-style-type: none"> Development Regulations, Schedule 22 8(6) Environment Protection Act, Schedule 1 8(6) 	Outdoor	2,000	<p>This typically includes both indoor and outdoor ranges for a range of gun types including handguns and rifles.</p> <p>The off-site noise impact of indoor ranges is significantly reduced as compared to outdoor ranges, and as such would generally be allowed to encroach significantly closer than a similar outdoor range.</p>

Activity	Additional activity notes	Evaluation distance (metres)	Description of typical activities and potential <u>air</u> or <u>noise</u> impacts
Discharges to marine or inland waters <ul style="list-style-type: none"> Development Regulations, Schedule 22 8(7) Environment Protection Act, Schedule 1 8(7) 		Individual assessment	Pumps used to discharge to marine or inland waters can potentially have a noise impact on sensitive receptors in the vicinity.
Retreading tyres <ul style="list-style-type: none"> Development Regulations, Schedule 21 7(3)(a) 		300	<p>The application of a new tread on used tyres can be done in two ways. The pre-cure method uses adhesives to add a new tread to an existing tyre while a mould-cure method places the old tyre in a mould casing where the new tread is added as a raw rubber that solidifies as the new tread. Both methods have the potential for releasing odour.</p> <p>Dust emissions may result from the buffing of the tyres prior to retreading.</p>
Fibre-reinforced plastic manufacturing <ul style="list-style-type: none"> Development Regulations, Schedule 21 7(3)(b) 		300	Fibre-reinforcing, typically fibreglass or carbon-fibre, is usually applied using glues such as polyurethanes and polystyrenes, where the main emissions are organic odours.

Non-scheduled activities

Activity	Additional activity notes	Evaluation distance (metres)	Description of typical activities and potential <u>air</u> or <u>noise</u> impacts
Bakery	Using more than 20 tonnes of ingredients per week	200	Bakeries can cause noise impacts due to their early start times and also emit odour. Despite the pleasant hedonic tone of the odour, continuous odours (even nice food odours) can cause nuisance.
Biosolids or septage spreading	Spreading biosolids on land Spreading septage on land	100 400	Odour is the main impact of spreading biosolids or septage on land. For further information refer to Draft South Australian biosolids guidelines for the safe handling and reuse of biosolids
Charcoal manufacturing	By retort process Other than by retort process	500 1,000	The manufacture of charcoal essentially is the heating of wood or other carbon-based substances (eg sugar) to drive off water and volatile organics, and form a carbon and ash mixture. The retorting process uses the flammable gases for heat recovery, reducing odour emissions, which is the main pollutant of concern.
Diesel fuel power generators	Does not include portable and/or domestic units	Individual assessment	Noise is the main issue associated with the use of diesel generators. The frequency, time of day a generator is used and sound-mitigating insulation/housing will affect the potential for impacts from noise. Diesel generator operations also result in emissions to air. The potential impact on air quality will depend on factors such as the number of generators, emission controls and frequency of use.
Dog kennels	Including dog refuges, shelters and commercial dog kennels (boarding or breeding)	500	One of the major impacts of dog kennels is noise from barking dogs. Consideration should be given to the number of dogs kept on the premises and also whether there are multiple kennels in close proximity. Odour can also be an issue, however regular cleaning of the kennels and effective waste management can minimise the potential for odour nuisance.
Dyeing & finishing		100	The application of dyes and related chemicals to materials, such as textiles, produces odour.

Activity	Additional activity notes	Evaluation distance (metres)	Description of typical activities and potential <u>air</u> or <u>noise</u> impacts
Frost fans		2,000	The use of frost fans can result in noise impacts. They are generally used at night and early in the morning as this is when the risk of frost is highest.
Gas distribution works		300	The distribution of natural gas through a reticulated network requires stations where distribution is directed. These stations, as well as odourant dosing stations, pose some risk of mercaptan emissions, which may cause odour complaints.
Intensive sheep feeding systems		See: National procedures and guidelines for intensive sheep and lamb feeding systems	An intensive sheep feeding system includes pens, handling facilities, sedimentation systems, holding ponds, and manure stockpiles and composting areas. Odour is the primary concern, however dust and noise may also be an issue. Sources of odour, dust and noise are generally the same as for a beef cattle feedlot and are mentioned above.
Major roads	For the purposes of this document Class 1, 2, 3, 6 and 7 roads are considered to be major roads (see Road Classification Guidelines in South Australia)	100	Emissions from cars, trucks, buses and motor bikes, can have an impact on air quality as well as result in noise impacts. Emissions from motor vehicles include particles, oxides of nitrogen, carbon monoxide and benzene. Design techniques to protect sensitive development from air and noise emissions are contained in Reducing noise and air impacts from road, rail and mixed land use – A guide for builders, designers and the community and Minister's Specification SA 78B Construction requirements for the control of external sound .
Rope, cord and twine manufacturing		100	The manufacturing of rope, cord and twine can potentially produce dust and odour.

Activity	Additional activity notes	Evaluation distance (metres)	Description of typical activities and potential <u>air</u> or <u>noise</u> impacts
Stockpiling		Individual assessment	<p>The major impacts of stockpiling are dust, and in some cases odour. The environmental risk posed by stockpiling is dependent on a number of factors including the material being stockpiled, stockpile size and height, and the measures used to control emissions.</p> <p>A varied range of material is stockpiled by different industries and can include lime, clay, sand, cement, ores, compost and many more. Stockpile materials composed of fine particles have a greater environmental and health risk as the particles are more easily lifted by wind and the particles are small enough to breathe in. Coarser particles on the other hand are generally too large to breathe in and as a result cause more of a nuisance.</p> <p>There are a number of measures that can be put in place to minimise dust and odour impacts associated with stockpiling and can include the use of dust suppression sprays, covering stockpiles, fully enclosing them in sheds, using sheds with negative pressure systems, screening, etc.</p>

Appendix 2 Recommended evaluation distances for poultry farms

Note:

- 1 Both the recommended minimum distances and calculated evaluation distance apply.
- 2 To be used for poultry farms (or groups of farms) with fewer than 500,000 birds

Recommended minimum distances (metres)

Feature	Minimum distance
Public road >50 vehicles per day	200
Public road <50 vehicles per day	50
Town	750
Rural residential	500
Rural dwelling	250
Property boundary	20

Evaluation distance (metres)

$$D = N^{0.55} \times 30 \times S1 \times S2 \times S3 \times S4 \times S5$$

where:

D = Evaluation distance (metres)

N = Total number of birds on farm in 1,000; N = 500 for 500,000 birds

0.55 = Shed area exponent

S1 = Type of poultry farm

S2 = Receptor type

S3 = Litter/manure handling

S4 = Surface roughness factor

S5 = Terrain weighting factor

S1 factor

Type of poultry farm	Factor
Broiler meat bird production	1
Broiler meat bird production (free range)	0.85
Egg production	0.6

S2 factor

Receptor type	Factor
Town	2
Rural residential	1.5
Rural dwelling	1

S3 factor

Litter/manure handling	Factor
Used litter/manure taken off-site	1
Litter/manure on site >3 days and <2 weeks	1.15
Litter/manure stored/composted on site >2 weeks	1.3

S4 factor

Surface roughness features	Description	Factor
Settled areas	Metropolitan area or continuous residential, commercial and/or industrial areas.	1.00
Long grass, few trees	Open country with few or scattered trees. Topography would be predominantly flat to slightly undulating.	1.00
Undulating hills	Situations where topography consists of continuous rolling, generally low-level hills and valleys, but without sharply defined ranges, ridges or escarpments. Assumes minimal vegetation.	0.93
Level wooded country	Open forest country with tree density not sufficient to provide a continuous canopy, but sufficiently dense to influence air movement. There would be little or no lower-storey vegetation. The density is such that the vegetation can be considered as a continuous belt.	0.85

Surface roughness features	Description	Factor
Heavy timber	Generally tall forests with dense timber stands, providing a continuous canopy. There is limited understorey vegetation, mainly associated with regrowth.	0.77
Significant hills and valleys	Where one or more lines of hills are sufficiently large enough to influence air movement between the receptor and the activity.	0.68

S5 factor

Terrain	Factor	
	Downslope	Upslope
Broad valley/drainage (0.1–1%)	1.6	1
Sloping terrain (1–2%)	1.5	1
Flat (<0.1% in all directions)	1	1
Hilltop (>4%)	1.2	–
Narrow valley (1–2%)	1.2	0.5

Notes:

- 1 These factors may not apply where sea breezes are a significant influence on weather patterns (ie in coastal regions), or where odour is emitted from elevated vent sources.
- 2 Downslope factors should be applied across an angle of 90° centred on the terrain feature. Upslope factors should be applied across an angle of 60° centred on the terrain feature.

Examples

- For a farm of 440,000 broilers (10 sheds each 150 m x 15 m with 44,000 birds in each shed) on flat open ground where litter/manure is taken off-site

$$D = 440^{0.55} \times 30 \times 1 \times 2 \times 1 \times 1 \times 1$$

$$D = 1,706\text{m to a town}$$

$$D = 440^{0.55} \times 30 \times 1 \times 1 \times 1 \times 1 \times 1$$

$$D = 853 \text{ m to a rural dwelling}$$

- For a farm of broilers on flat open ground where litter/manure is taken off-site

Number of birds	Calculated distance to a rural dwelling (metres)	Recommended distance to a rural dwelling* (metres)
50,000	260	260
100,000	380	380
200,000	550	550
300,000	690	690
400,000	810	810
500,000	920	920

*whichever is greater out of the minimum distance and calculated evaluation distance (recommended minimum distance to a rural dwelling is 250 m)

- For an egg farm on flat open ground where litter/manure is taken off-site

Number of birds	Calculated distance to a rural dwelling (metres)	Recommended distance to a rural dwelling* (metres)
35,000	130	250
70,000	190	250
105,000	230	250
140,000	270	270
280,000	400	400

*whichever is greater out of the minimum distance and calculated evaluation distance (recommended minimum distance to a rural dwelling is 250 m)

Appendix 3 Further examples of evaluation distance profiles

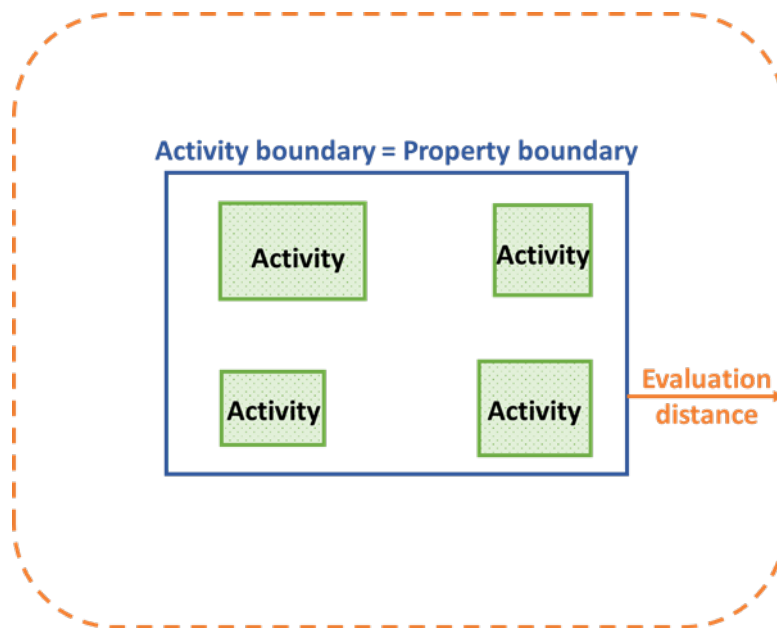


Figure 5 Activity boundary encloses several similar activities under a single owner

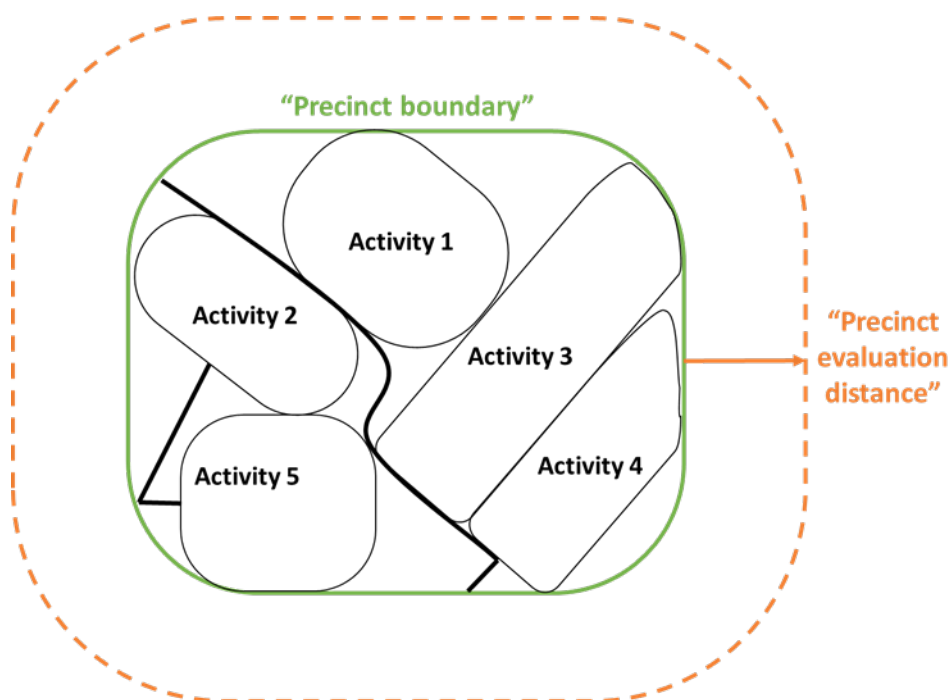


Figure 6 Precinct with several similar activities under different owners and operators

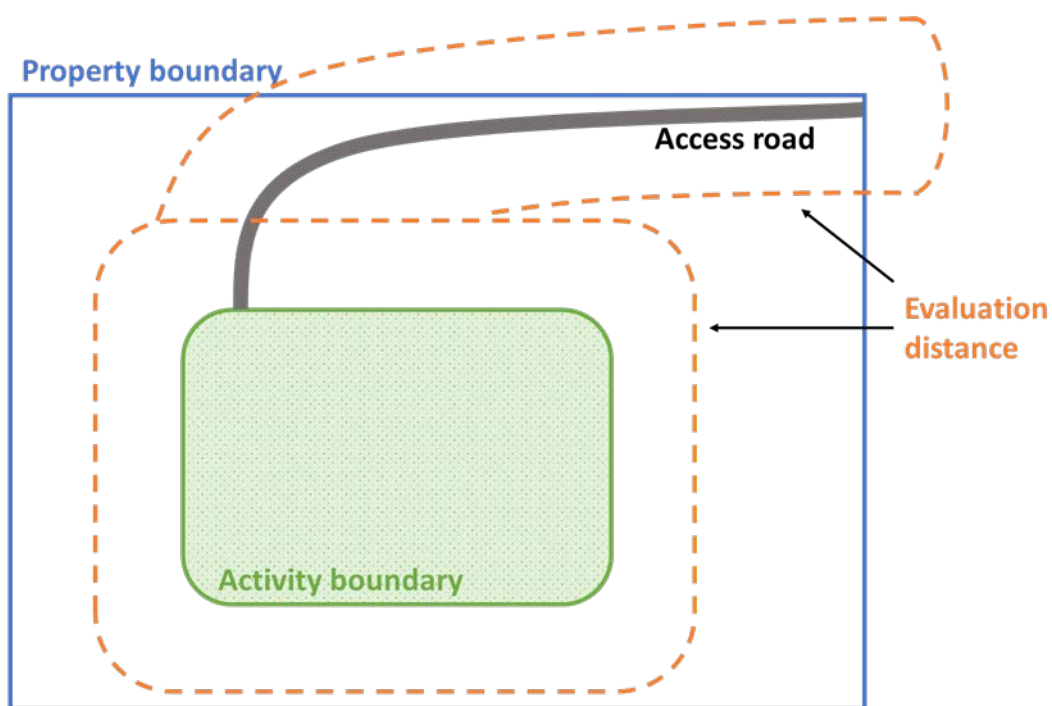


Figure 7 Effect of access roads/ under a single owner/operator

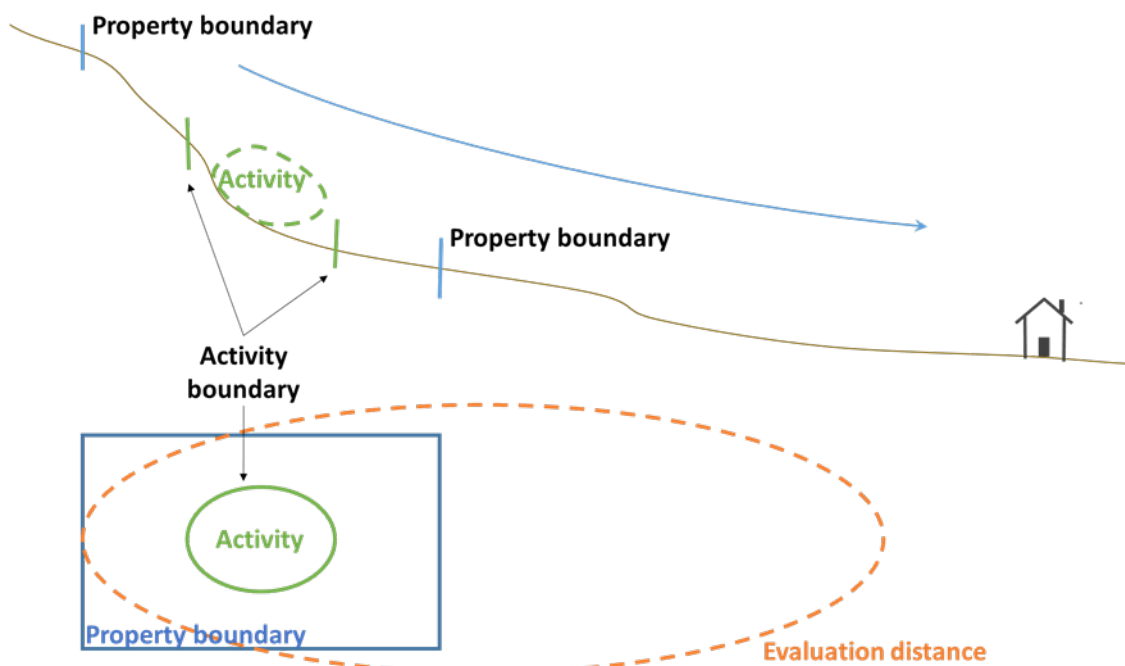


Figure 8 Biased or irregularly shaped evaluation distance

The example in Figure 8 shows local topography and surface roughness features exacerbating odour impacts in some directions and mitigating them in others.

References

Tucker RW, McGahan EJ, Galloway JL and O'Keefe MF 2010, *National Environmental Guidelines for Piggeries* – second Edition, APL Project 2231, Australian Pork Ltd, Deakin, viewed 5 August 2016, <http://australianpork.com.au/wp-content/uploads/2013/10/National-Environmental-Guidelines-for-Piggeries.pdf>

Tucker RW and O'Keefe MF 2011, *National Environmental Guidelines for Rotational Outdoor Piggeries*, FSA Consulting, Report 7634/2, 10th August 2012, FSA Consulting, Horsham, viewed 5 August 2016, <http://australianpork.com.au/industry-focus/environment/national-environmental-guidelines-for-piggeries/>

Meat and Livestock Australia Limited 2011, *National procedures and guidelines for intensive sheep and lamb feeding systems*, Meat & Livestock Australia Ltd, North Sydney, viewed 5 August 2016, www.mla.com.au/News-and-resources/Publication-details?pubid=5920

Meat and Livestock Australia Limited 2012, *National guidelines for beef cattle feedlots in Australia*, third edition, Meat & Livestock Australia Ltd, North Sydney, viewed 5 August 2016, www.mla.com.au/News-and-resources/Publication-details?pubid=5939

Department of Planning, Transport and Infrastructure 2013, *Minister's Specification SA 78B Construction requirements for the control of external sound*, DPTI, Adelaide, viewed 5 August 2016, www.sa.gov.au/_data/assets/pdf_file/0011/7697/Construction_requirements_for_the_control_of_external_sound.pdf

—2012, *Reducing noise and air impacts from road, rail and mixed land use - A guide for builders, designers and the community*, DPTI, Adelaide, viewed 5 August 2016, www.sa.gov.au/_data/assets/pdf_file/0016/21391/Design_Guidelines_Reducing_noise_and_air_impacts_from_road_rail_and_mixed_land_use.pdf

Environment Protection Authority, 2016, *Ambient air quality assessment*, EPA, Adelaide, viewed 5 August 2016, www.epa.sa.gov.au/files/11833_ambient_aq_assessment_2016.pdf

—2015, *Music noise from indoor venues and the South Australian Planning System*, EPA, Adelaide, viewed 5 August 2016, www.epa.sa.gov.au/files/4771136_guide_music.pdf

—2014, *Wastewater lagoon construction*, EPA, Adelaide, viewed 5 August 2016, http://www.epa.sa.gov.au/files/4771372_guide_lagoon.pdf

—2013, *Compost guideline*, EPA, Adelaide, viewed 5 August 2016, www.epa.sa.gov.au/files/4771342_compostguideline.pdf

—2013, *Guidelines for the assessment of noise from rail infrastructure*, EPA, South Australia, Adelaide, viewed 5 August 2016, www.epa.sa.gov.au/files/47789_guidelines_rail_noise.pdf

—2012, *Emission testing methodology for air pollution*, version 2, EPA, Adelaide, viewed 5 August 2016, www.epa.sa.gov.au/files/477264_emission_manual.pdf

—2007, *EPA guidelines for environmental management of landfill facilities (municipal solid waste and commercial and industrial general waste)*, EPA, Adelaide, viewed 5 August 2016, www.epa.sa.gov.au/files/4771343_guide_landfill.pdf

—2009, *Draft South Australian biosolids guidelines for the safe handling and reuse of biosolids*, EPA, Adelaide, viewed 5 August 2016, www.epa.sa.gov.au/files/8420_guide_biosolids_2009_draft.pdf

Legislation

[Environment Protection Act 1993](#)

[Environment Protection \(Air Quality\) Policy 2016](#)

[Environment Protection \(Water Quality\) Policy 2015](#)

[Environment Protection \(Noise\) Policy 2007](#)

[Development Act 1993](#)

[Development Regulations 2008](#)

Glossary

airshed	A geographical area where local topography and meteorology limit the dispersion of pollutants away from the area.
background level of a pollutant	The concentration of a pollutant that would exist in the absence of the additional source of that pollutant under assessment.
biochemical or biological oxygen demand (BOD)	A measure that provides an indication of the amount of oxygen required for microbiological oxidation of organic materials to carbon dioxide.
biosolids	Sludges that have been treated to a standard suitable for beneficial use. That is, stabilised organic solids derived totally or in part from wastewater treatment processes which can be managed safely to utilise beneficially their nutrient, soil conditioning, energy or other value. Does not include untreated wastewater sludges, industrial sludges or the product produced from the high temperature incineration of sewage sludge. Many other solid waste materials are not classified as biosolids, eg animal manures, food processing or abattoir wastes, solid inorganic wastes, and untreated sewage or untreated wastes from septic systems/sullage wastes.
cumulative impact	The impact on the environment which results from the incremental impact of the activity when added to other past, present, and reasonably foreseeable future activities occurring or likely to occur in the airshed regardless of the person undertaking such activities.
environment	Means land, air, water, organisms and ecosystems and includes human-made or modified structures or areas as well as the amenity value of an area.
environmental harm	As defined in section 5 of The <i>Environment Protection Act 1993</i> , environmental harm includes both harm and potential harm, and environmental nuisance. Further categorised as material or serious environmental harm, according to the nature and scale of its impacts. From an air quality perspective, environmental harm is caused by air pollutants having toxic or adverse effects on human health or the environment.
environmental nuisance	Defined in the EP Act as any adverse effect on an amenity value of an area that is caused by pollution; and unreasonably interferes with or is likely to interfere unreasonably with the enjoyment of the area by persons occupying a place within, or lawfully resorting to, the area; or any unsightly or offensive condition caused by pollution;
equivalent person (EP)	As defined by the <i>South Australian Public Health (Wastewater) Regulations 2013</i> .
evaluation distance	<p>Evaluation distances provide an envelope around an activity (or multiple activities) within which environmental risks need to be assessed (against current knowledge, technologies and practices) and managed.</p> <p>For the purposes of this document, the term embodies other terminology such as buffer distances, buffer areas or separation distances, which may still appear in reference documents.</p>
general environmental duty	As defined in section 25 of the EP Act. A person must not undertake an activity that pollutes, or might pollute, the environment unless the person takes all reasonable and practicable measures to prevent or minimise any resulting environmental harm.

PAHs	<p>Polycyclic aromatic hydrocarbons are organic compounds (carbon-based) which include only carbon and hydrogen with a structure of fused rings. They contain at least two fused benzene (six sided) rings. They may contain other rings of carbon that are not six sided. Most do not dissolve easily into water, but some readily evaporate into the air. Most do not burn easily. They are formed by the incomplete combustion of coal, oil, petrol, wood, tobacco, charbroiled meats, garbage, or other organic materials. Several PAHs are considered to be carcinogenic to humans.</p>
PM_{2.5}	<p>PM means particulate matter. PM_{2.5} is a name given to particles in the air that are so small that when we breathe them in, they can travel right down into the deep parts of our lungs. PM_{2.5} means that the largest particles have sizes of around 2.5 micrometres (µm) in diameter.</p> <p>Common types of PM_{2.5} particles are smoke and exhaust fumes from vehicles.</p>
PM₁₀	<p>PM means particulate matter. PM₁₀ is a name given to particles in the air that are small enough for us to be able to breathe them in. Some of the larger ones may only reach as far as our throats, while others may travel right down into our lungs. PM₁₀ means that the biggest particles in a sample are about 10 µm in diameter.</p> <p>A sample of PM₁₀ particles may also contain PM_{2.5} particles (see PM_{2.5}).</p>
polluting activity	<p>Any activity that has the potential to cause pollution to air, land, water or the noise environment.</p>
residual environmental risk	<p>The level of environmental risk that still exists after all controls are considered.</p>
sensitive land use	<p>Sensitive land use in this document is used descriptively to include those uses defined in section 3 of the EP Act but is taken to include others such as those listed under Sensitive land uses.</p>
sensitive receptor/receiver	<p>A sensitive receptor is a fixed location such as a house, building, other premises or open area where health, property or amenity are affected by emissions that increase the concentration of the emitted parameter above background levels.</p> <p>Sensitive environments, plants and animals may also be considered as sensitive receptors because vegetation and animals can also be affected by emissions.</p>
septage	<p>Liquid or solid component of human waste removed from domestic septic tanks that can be land spread (in a manner that ensures community health and safety and protection of the environment).</p>
volatile organic compounds	<p>VOCs are a broad range of carbon-based chemicals that can exist in the vapour phase at normal ambient temperatures. VOCs come from vehicle exhausts, burning of wood and other fuels (coal, petrol and oil), bushfires and planned burning, and storage of fuels and solvents from paints, dry cleaning, and cleaning of machinery. Large amounts also come from the oils that trees and other vegetation release into the air, especially in warm weather. VOCs can be odorous and some can have adverse impacts on human health and the environment. One example is benzene which is carcinogenic to humans.</p>
Water Protection Areas	<p>Areas of South Australia that are highly sensitive to potential contamination of water resources, both surface water or ground water, and have been declared Water Protection Areas under the EP Act.</p>