

Landfill gas and development near landfills—advice for planning authorities and developers

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EPA 969/12: This information sheet provides planning authorities, developers and landfill owners and operators with clarification of EPA advice relating to the risks presented by landfill gas, and the basis on which the EPA will respond to development applications. It summarises advice from other publications including [Guidelines for environmental management of landfill facilities \(municipal solid waste and commercial and industrial general waste\)](#).

Introduction

There are number of environmental issues associated with current and historic landfill sites. The issues include visual amenity, odour, dust, noise, landfill gas and the potential for groundwater contamination.

Landfill gas is generated by decomposing material in landfills and includes methane. If not properly controlled, the gas can travel underground and present an explosive and asphyxiation hazard at neighbouring properties.

The extent of the risk depends on the size and age of the landfill, the type of waste deposited there, the presence of water, and geological conditions.

There are a number of means of controlling landfill gas movement. These include monitoring, venting and extracting gas at the landfill site, and a buffer distance between the landfill and neighbouring developments.

Landfill gas presents a risk only when it accumulates in structures so the maintenance of a buffer or separation distance between a landfill and a structure is an effective risk management measure. The land close to a landfill may be suitable for other purposes such as open recreation.

Modern landfills are well engineered with reliable landfill gas control measures to meet EPA standards. Some older landfills are not so well engineered, and there are also legacy landfills with no active control and unknown levels of risk.

Development near to current and historic landfill sites may therefore be impacted by the risks from landfill gas.

It is preferable to address landfill risks at the earliest stages of planning policy development.

Challenges

The risks of landfill gas are variable and often unknown. It is therefore necessary for the EPA to take a carefully considered and precautionary approach to managing the risks.

In some circumstances, the EPA is able to impose mandatory direction to planning authorities on the conditions of development. For most subdivisions the EPA provides only advice to planning authorities, which may impact on conditions of development approval. The EPA recognises the importance of certainty for planners and developers with respect to risks and responsibilities and tries to ensure that recommendations are clear, reasonable and practicable.

The EPA works with other sectors of government, and in particular with its planning and development agencies, the Department of Planning and Local Government (DPLG) and the Land Management Corporation (LMC), so that landfill risks can be addressed during planning policy development. The lack of comprehensive information on historical landfills makes it difficult to provide the most effective advice early.

Particularly with historical landfills, there may already be residential development within the EPA recommended buffer distance. Urban infill also means that new development will increasingly occur near to such landfills.

EPA's position

The EPA's role is described in the *Environment Protection Act 1993* (the Act). The EPA:

In general

- will work actively with other parts of government to ensure that landfill risks are addressed at the earliest stages of planning policy development
- advises that a risk assessment should be undertaken where development exists or is proposed within 500 m of a landfill, and where the level of risk is not known.

New developments

- will provide advice and direction as appropriate regarding developments proposed near to landfills (for example development assessment referrals) in accordance with this document
- advises that in the absence of site-specific risk information, an effective control measure is a 500 m buffer between developments and landfills, measured from the outer boundary of the area containing waste or licensed to contain waste (ie that may contain waste in the future)
- advises that risks are very site specific, and that with appropriate risk assessment development is possible within 500m
- considers that the risks from landfill gas beyond 500 m is sufficiently low that development can occur without any assessment of the gas risks conditions or any controls, except where specific contrary evidence exists (eg from an audit report)
- acknowledges that for historic landfills the level of risk will vary by site, allowing subject to an appropriate risk assessment development to be safely undertaken within a 500 m buffer in some site-specific circumstances.

Existing developments

- will provide advice on risks
- will require landfill licensees or owners to take action to assess and manage landfill gas as appropriate.

New landfills

- requires through licensing all new landfills to maintain a 500 m buffer under the control of the licensee (so that development cannot occur in the buffer zone).

Responsibilities

The EPA will work with operators, owners, planning authorities and developers to identify the most reasonable and practicable solutions. Where necessary, the EPA is able to impose requirements under the Act.

Landfill operators have a duty under the Act to take all reasonable and practicable measures to prevent harm from pollutants such as landfill gas arising from their landfill activities. The EPA places licence conditions on landfill operators that include the requirement to assess and control landfill gas.

Where there is existing development within 500 m of a landfill, those requirements may include arranging risk assessments and undertaking any recommended monitoring and mitigation measures. Where the landfill operator has control of the 500-m buffer, EPA licence conditions might include permitting landfill operations only if no development occurs within the buffer.

For closed landfills, the EPA is able to require assessment and control of site contamination including landfill gas. Responsibility for assessing and managing landfill gas will usually fall to the person that caused it, that is the former landfill operator. Where it is not practicable to require this of the former operator in certain circumstances, the current owner will be responsible. The EPA can impose requirements through Site Contamination Assessment Orders and Site Remediation Orders under Sections 103H and 103J of the Act respectively.

Where there is existing development within 500m of a closed landfill, the EPA may be able to require the former operator or current owner to arrange risk assessments and undertake any recommended monitoring and mitigation measures.

Schedule 21(7)(4)(a)ii of the *Development Regulations 2008* defines development within 500m of a landfill as an *Activity of Environmental Significance*. The relevant planning authority is required to refer such development to the EPA for advice.

Persons undertaking new development within 500 m of a closed or operating landfill may have responsibilities for assessing the risk of landfill gas and potentially for undertaking monitoring and mitigation measures. This is because, for the purposes of the Act, those persons are considered to have caused site contamination if the development creates a risk to future residents from landfill gas.

If development is proposed within 500 m of a landfill (even if adjacent to existing development), the operator/owner *and* the developer may have responsibilities to undertake a risk assessment.

If the risk assessment indicates that control measures are required, then these are likely to be different for the operator/owner and for the developer. The operator/owner is likely to be required to control the landfill gas at the source, to limit off-site movement. The developer may have to change development plans so that a risk is not created. In practice, this can mean having open area use for those affected parts of the development area.

In managing a historical landfill it can take the operator/owner some time to establish gas monitoring systems, to collect sufficient results to assess risks, and to construct gas management infrastructure. In such cases developers may consider commissioning risk assessments to meet their own timeframes, so that they can demonstrate the development area is not impacted.

The EPA will encourage and assist coordinated responses in these shared responsibility situations.

Buffer

Landfill gas is known to move from landfills to adjacent areas. This movement is unpredictable and dependent on the nature of the landfill and on local geology. Factors that increase the risk are size and age of landfill, construction standards, type of landfill (eg putrescible waste), and distance to landfill.

Because of the variability of the other factors, a buffer is the most effective means of ensuring that distance is maintained between landfill gas and developments. The EPA has identified 500 m as a reasonable default buffer distance, beyond which the risk in all cases is likely to be very low.

The buffer is set conservatively because of the potential high risks. As an example of the potential distance that gas can move, methane from the Brookland Greens landfill in Victoria was found 200 m from the landfill. The EPA endeavours to be consistent with national approaches; Victoria and Tasmania specify buffer distances from putrescible waste landfills of 500 m for the purpose of protecting residences from landfill gas.

The EPA advises that it reasonable to reduce the buffer distance in site-specific circumstances based on appropriate risk assessments.

The buffer should be measured from the outer boundary of the area licensed to contain waste, ie which contains waste now or may do in the future (Figure 1). Further information is provided in the EPA guidelines, [Environmental management of landfill facilities \(municipal solid waste and commercial and industrial general waste\) \[2007\]](#) and the [Guidelines for Separation Distances \(2007\)](#).

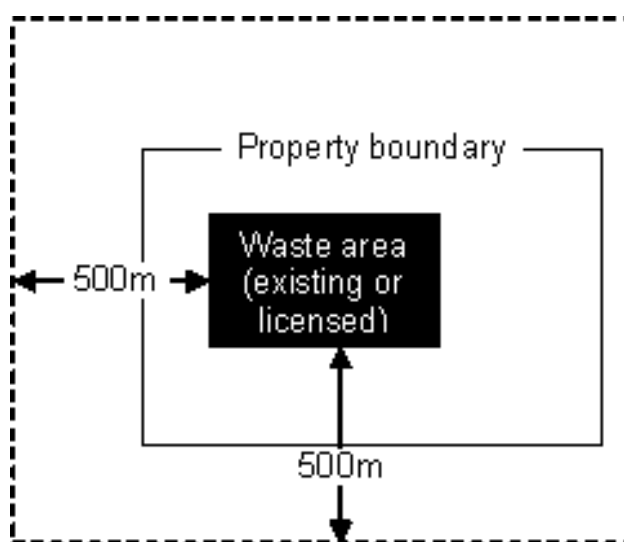


Figure 1 Example of a 500-m buffer not under the control of the landfill operator/owner

Risk assessment

In this context, development means construction of a building or enclosure that may accumulate gas. Low-risk uses such as open space, fences and signage are possible within the 500-m buffer without a risk assessment.

Where a relevant risk assessment exists then a new assessment would be justified only when changes have occurred that might increase the level of risk. For example, one risk assessment may adequately address the landfill owner's responsibility to manage risk and also a developer's responsibility to ensure that development does not introduce a new risk.

The level of expertise involved depends on the level of risk. Table 1 indicates the EPA recommendation for an appropriate assessor. Landfill size is determined on the total volume of waste to be disposed at the site over the life of the landfill.

Table 1 EPA's recommendation for the appropriate assessor to conduct a risk assessment within 500 m of a landfill

Landfill size	Small <26,000 tonnes	Medium ≥26 000 and <130 000 tonnes	Large ≥130 000 tonnes
Assessor	Site contamination consultant ¹	Site contamination auditor ²	Site contamination auditor

The EPA is able to provide advice on the size of licensed landfills. The estimated size of a legacy landfill may need to form part of the risk assessment.

Expectations of site contamination consultants and auditors

A site contamination consultant's landfill gas risk assessment should certify that the land is suitable for the proposed development. This should be an environmental report in accordance with National Environment Protection Measure guidelines.

A site contamination auditor's report and associated audit statement should state that, in the opinion of the auditor, the site is suitable or can be made suitable subject to certain conditions being met, for the intended use(s). The audit report should be in accordance with EPA guidelines.

The auditor or consultant must take into account the proposed land use and potential impact of historic, current and future landfill site activities, especially future location of landfill cells which would affect the 500-m buffer. The assessment may also need to include investigations to determine the extent of in-situ waste on a site-specific basis; particularly for historic landfills for which complete information may not be readily available.

The outcomes of the risk assessment may require ongoing or additional monitoring and management measures at the landfill boundary and/or in the area proposed for development, in addition to specific design and construction techniques.

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.

¹ Site contamination consultant, as defined in Section 3 of the *Environment Protection Act 1993*, means a person other than a site contamination auditor who, for fee or reward, assesses the existence or nature or extent of site contamination. The site contamination consultant should have experience in the assessment and management of landfill gas and other risks associated with waste management facilities.

² Site contamination auditor as defined in Section 3 of the *Environment Protection Act 1993* means a person accredited under Division 4 of Part 10A as a site contamination auditor

Further information

Legislation

Legislation may be viewed on the Internet at: <www.legislation.sa.gov.au>

Copies of legislation are available for purchase from:

Service SA Government Legislation Outlet
Adelaide Service SA Centre
108 North Terrace
Adelaide SA 5000

Telephone: 13 23 24
Facsimile: (08) 8204 1909
Website: <shop.service.sa.gov.au>

For general information please contact:

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