



## Factsheet



# Landfill gas

Landfill gas is generated by the decomposition of waste in a landfill. Methane and carbon dioxide make up approximately 99 per cent of the volume of landfill gas, while the remaining one per cent is made up of over 500 trace components (Environment Agency, 2002<sup>1</sup>) such as hydrogen sulphide and ethanethiol produced when there is microbial breakdown of waste.

## What is methane?

Methane is a colourless, odourless gas which is lighter than air and can accumulate in enclosed areas such as cupboards and ceiling and sub floor spaces.

It is explosive at concentrations between 5-15 per cent in air where oxygen is present at concentrations between 12 per cent and 20.9 per cent (Kissell 2006<sup>2</sup>). At these concentrations methane can be easily ignited by sparks or flames which can result in injury.

## What can I smell?

The one per cent of trace components found in landfill gas are what produces the distinctive landfill gas odour - that many people alike to rotten eggs.

The human 'smell' threshold of these trace components is very low, which is why, even though they only account for a small volume of landfill gas, humans can smell it so easily.

The presence of this odour at such low levels does not usually cause health effects, however many trace components can have physiological effects at higher concentrations.

## What happens to landfill gas in a landfill?

In a properly managed landfill the gas is captured through gas extraction systems, which include landfill gas engines or flares (or both) that destroy methane and at least 98 per cent of the trace components.

When landfill gas is combusted in an engine it also produces electrical energy.

Sites that smell are symptomatic of poorly functioning or poorly designed gas extraction systems. This can be compounded where development has been allowed too close to the landfill. Over the last two years where there has been heavy rainfall, many landfill operators have been caught out. The increased moisture has produced more landfill gas and leachate (contaminated water produced when clean water interacts with waste in a landfill). Poor leachate management has flooded landfills causing gas extraction systems to fail and undersized gas extraction systems have not been able to cope with the increased gas volumes produced. These situations cause landfill gas to escape to the atmosphere causing odours.

## What are the immediate health effects of methane exposure?

At low concentrations in the air, methane does not affect health, however at very high concentrations in the air methane can displace oxygen and there is a risk of asphyxiation where this causes the oxygen concentration to reduce below 16 per cent.

When methane at high concentrations displaces oxygen in air it can result in a range of symptoms which includes dizziness, headache, visual disturbance, palpitations, and confusion. Lack of consciousness or death may occur if exposure to oxygen below 16 per cent is prolonged.

People who already have medical conditions for example heart or lung disease may be more easily affected.

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## FAST FACTS

Landfill gas is generated by the decomposition of waste in a landfill.

99 per cent of landfill gas is made up of methane and carbon dioxide. The remaining one per cent is made up of over 500 trace components that produce a distinctive odour.

The presence of this distinctive odour, at such low levels, does not usually cause health effects.

Exposure to landfill gas at low levels is unlikely to result in long term adverse health effects. Methane is not known to cause any long term health effects like cancer or birth defects.

If you are concerned about your health or the health of anyone in your household, seek medical advice from your local doctor.

1 Investigation of the Composition and Emissions of Trace Components in Landfill Gas. R&D Technical Report P1-438/TR, pp vi. ISBN: 1 84432 018 9.

2 Handbook for Methane Control in Mining. National Institute for Occupational Safety and Health, DHHS (NIOSH) Publication No. 2006-127, pp 154.