

Composting and potential health effects from bioaerosols: our interim guidance for permit applicants

Background

The regulation of bioaerosols from permitted composting sites is being considered as part of the Government waste policy review in England, expected to report in Spring 2011. In the interim, Defra and the Welsh Assembly Government have agreed that the arrangements contained within this interim guidance will apply across England and Wales to composting operations that are, or will be, within 250 metres of a 'sensitive receptor' (typically a dwelling or workplace). This note replaces our 2007 position statement on Composting and the Potential Health Effects from Bioaerosols.

One particular aspect of composting that needs to be controlled is the release of potentially harmful bioaerosols. We take this into account before authorising any new composting facility located where the [composting operations](#) would be [within 250 metres of sensitive receptors](#).

New permit applications

For some time we have required applicants for environmental permits for new composting operations within 250 metres of workplaces or dwellings to carry out a Site Specific Bioaerosol Risk Assessment (SSBRA) in support of their application. Before granting a permit we need to be satisfied that the SSBRA shows that bioaerosols can, and will, be maintained no higher than [acceptable levels at the sensitive receptors](#).

The interim position for such sites is that, subject to the SSBRA assessment, applicants will be issued permits where:

- a) [the maximum quantity of waste handled at any one time](#) does not exceed 500 tonnes, or
- b) if the quantity of waste handled exceeds 500 tonnes, the operations are carried out in a way and with the necessary measures (e.g. negative aeration, enclosure) to ensure that they are not [likely to result in the uncontrolled release of high levels of bioaerosols](#).

We will not apply any generic requirements for bioaerosol monitoring at new sites, pending the review of waste policies. We will assess the need for monitoring at new sites as part of the permit determination, based on the individual circumstances of the particular site and taking into account the cost of monitoring.

Permit variation applications

Similar considerations may apply to permit variations, depending on the scale and nature of the proposed variation.

Applications for permits for formerly exempt operations at existing sites

The revised composting exemption, which came into force in April, as part of the Environmental Permitting (England and Wales) Regulations 2010, reduced the amount of waste being composted on a site at any one time from 1,000 cubic metres (about 300 to 400 tonnes) to 60 or 80 tonnes (depending on where the composting takes places and where the compost is used).

As a result, we are expecting that a number of operators of formerly exempt operations will need to apply for an environmental permit if they want to continue operating on the same scale after the transitional period (up to 1st October 2013 for on-farm sites and 1st October 2011 for others). They will be able to apply for a standard rules permit in the normal way if the composting operations are more than 250 metres from workplaces and dwellings. The interim arrangements for those that are not more than 250 metres from workplaces and dwellings are:

- we will not require a new SSBRA if the applicant has previously provided one as part of the exemption registration process and it is still relevant and suitable.
- we will not impose any general bioaerosol monitoring requirements within the permit pending the Defra review of waste policies

Existing permitted sites

We will carry out a selective review of existing permitted sites that are less than 250 metres from sensitive receptors, to ensure that the permits have adequate requirements for bioaerosol monitoring in accordance with the [Association for Organics Recycling /Environment Agency standardised protocol for the monitoring of bioaerosols at open composting facilities](#). We will carry out this review on a risk-prioritized basis and vary permits as necessary (at no cost to the operators) to introduce these requirements.

The results of the subsequent monitoring should allow us to consider, with the operator, the need to review the operations and/or adopt additional measures to control bioaerosols (such as negative aeration or enclosure).

Further advice

Further advice on dealing with waste can be found on our website or by calling our customer service team on 08708 506 506.

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position statement

Definitions

composting operations

- Includes any associated waste storage and treatment operations carried out at the composting facility. Composting is the biological decomposition of biodegradable waste under conditions that are predominantly aerobic and that allow the development of thermophilic temperatures as a result of biologically produced heat.

sensitive receptors

- Sensitive receptors refers to people likely to be within 250 metres of the composting operation for prolonged or frequent periods. This term would therefore apply to dwellings (including any associated gardens) and to workplaces where workers would frequently be present. It does not apply to the operators of composting facilities or their staff while carrying out the composting operation as their health is covered by Health and Safety legislation.

acceptable levels at the sensitive receptors

- Refers to the concentrations of bioaerosols (as predicted or as derived from direct measurements) at the sensitive receptors which are attributable to the composting operations. The acceptable levels are 300, 1000 and 500 cfu m⁻³ for gram-negative bacteria, total bacteria and *Aspergillus fumigatus* respectively, as measured by the standardised monitoring protocol.

the maximum quantity of waste handled at any one time

- Refers to the total quantity of waste being stored or treated at any one time.

operations...likely to result in the uncontrolled release of high levels of bioaerosols

- Include the shredding of waste and the turning of waste in the sanitisation, stabilisation and maturation stages of composting where these operations are not contained or are not subjected to exhaust ventilation and scrubbing/filtering.

Explanatory note

Bioaerosols, composting and health effects

- Bioaerosols are complex mixtures of airborne micro-organisms and their products, and are ubiquitous, particularly in rural environments. The most serious health problems appear to arise from *Aspergillus fumigatus*, but there are other fungal spores and bacteria that cause problems. International studies have shown that there is a wide variability in individual susceptibility to bioaerosol exposure.
- Commercial scale composting activities tend to generate large amounts of bioaerosols and these are likely to contain human allergens and pathogens. They have potential effects on respiratory health and may cause headaches, nausea and fatigue. There has been very little investigation into the effects of community exposure to bioaerosols from composting, but there is some limited data that suggest that living close to a composting facility may be associated with an increased risk of adverse health effects. The consensus from various studies is that

bioaerosols from composting activities decline rapidly within the first 100 metres from a site and generally decline to background levels within 250m.

The way we regulate composting facilities

- Many small scale composting facilities will be able to operate without the need for an environmental permit. They just have to be registered with us as exempt waste operations. Larger scale facilities will need to operate under an environmental permit issued by us. This will either be a bespoke permit or a standard rules permit. Standard rules permits are available for composting facilities which are to be located more than 250 metres from dwellings or workplaces.

About the SSBRA

- Generally, the complexity of a risk assessment is related to the size and complexity of the proposed facility and the uncertainty of the risk posed, varying from a qualitative, largely generic approach at one extreme to a site specific quantitative risk assessment at the other.
- Standard methods of determining bioaerosol levels are available. However based on our present scientific understanding of bioaerosols, the way they behave and their health impacts we now consider that there is currently no suitable methodology for carrying out adequate quantitative SSBRAs for new composting facilities. Accordingly, we believe that we need to take a precautionary approach and not normally permit those facilities where we would have expected a quantitative SSBRA until such time as a suitable methodology becomes available.
- The types of new facilities affected by this are those that would have handled more than 500 tonnes of waste at any one time and would have carried out any “composting operations in the open that are likely to result in the uncontrolled release of high levels of bioaerosols”, as defined above. In practice, this would not include situations where the entire composting operation is carried out inside a building, or where composting takes place outside, but using negative aeration and without turning. However it would include compost maturation in conventional outdoor turned windrows, carried out following other treatment operations such as in-vessel composting, treatment in a dry AD (anaerobic digestion) plant and treatment in an MBT (mechanical biological treatment) plant.
- [Guidance on the evaluation of bioaerosol risk assessments for composting facilities](#) is available on our website.