

AHDB Pork Model Template B3.58B
Environmental Risk Assessment
Dust and Bioaerosols Management Plan

Background

A dust and bioaerosol risk assessment/management plan is required for new bespoke or substantial variation applications where a site is within 100m of a sensitive receptor such as the farmhouse or a neighbour.

Note: The level of detail needed will depend on the level of risk. Sites which are very close to sensitive receptors may need to consider additional mitigation techniques.

The overarching principle is that vague statements such as ‘the buildings will be inspected regularly’ should be avoided. It is essential to say who, how, when, where and what follow-up actions will be taken, eg the farm manager will perform a weekly walk-around inspection of the buildings, the findings will be recorded in the inspection and maintenance records in the farm office.

Table 1: Receptor locations

Receptor	Distance from site	Direction	Type of receptor
Receptor 1: Illustrative farmhouse	20m	South	Residential
Receptor 2: Home Farm	95m	South-west	Workplace and residential

The purpose of this Assessment and Dust and Bioaerosol Risk Management Plan is to:

- Establish the likely source of dust and bioaerosols arising from the farm
- Set out procedures at the farm in order to mitigate or minimise the risk
- Formalise an effective method of dealing with any complaints quickly and efficiently.

Potential sources

In accordance with the document, 'How to Comply with Your Environmental Permit for Intensive Farming', Appendix 11 Assessing Dust Control Measures on Intensive Poultry Installations, a risk assessment of dust and bioaerosol pollution was performed.

As a result, the following sources have been identified as contributing to a potential *low risk* dust/bioaerosol source:

Pathways and receptors

The pathway for all of the above sources is via the atmosphere. With the most sensitive receptors being inhabitants of nearby residential dwellings, the wind direction will significantly influence how receptors are affected. We have not received any complaints from neighbours relating to odour from the farm. The prevailing wind direction is southwesterly and, therefore, odour emission should be predominantly blown away from nearby neighbours.

Although the prevailing wind is in the direction of the receptors, there are control measures in place to ensure the minimisation of risk.

Table 2 gives a summary of some of the main at-source and exhaust control methods for particulate reduction from pig farms. In addition, all staff will receive training on all aspects of the farm operation which could lead to pollution, including the odour, noise and dust management plans, dealing with accidents and our general responsibilities under the permit.

Table 2: A summary of at-source and exhaust control methods for particulate reduction from pig farms

Choose relevant techniques or add your own. For a full list of dust and bioaerosol abatement techniques, please refer to ‘How to Comply with Your Environmental Permit’, Appendix 11. Weekly inspection of the site by the operator for any signs of dust which may leave the installation boundary or be a hazard to staff or visitors.

Source of dust	Example	How is reduction achieved?	Comments
General	Day-to-day activity	Weekly inspection of the site by the operator.	Look for any signs of dust which may leave the installation boundary or be a hazard to staff or visitors.
Pig feed	Dust from silos	Covers put over feed silo pipes.	Bags or containers should be in place on silo exhausts to catch any excess feed and dust.
	Dust extraction in feed mill areas	Filters reduce dust emissions to the outside.	These need to be cleaned regularly.
	Storage of feed	Use of covers for feed containers.	Biosecurity issue as well.
	Feed spill control	Collection of any spilt feed is undertaken to avoid dust being generated.	Good management practice and avoids possible pollution into a watercourse.
	Farm uses wet and dry feed	Wet feed is inherently less dusty.	Wet feed is becoming more common.
	Feeding method	Hoppers are filled carefully to minimise dust emissions. Sows and weaners are hand fed to reduce dust. A material sock is fitted to the end of the auger pipe that delivers the feed directly into the bin. The internal feed bin is covered with a plywood constructed top, and the auger pipe is fitted through the cover.	Hand feeding is likely to be impractical on larger farms. Auger pipes tend to have downpipes that stop around 30–60cm short of the internal feed bin. Fitting a material sock to the end of the pipe that delivers the feed directly into the bin may reduce the feed dust that is created by freefalling into the bin. The feed delivery into the bin is effectively sealed by the cover.

Source of dust	Example	How is reduction achieved?	Comments
	Spilled feed is swept up	Any spillages are cleaned up immediately.	
Bedding material	Application of bedding: Straw is added regularly as a manipulable material	Bedding is applied internally to the building rather than being blown in. Alternatives to straw may be used, eg paper. Bedding is stored under cover to maintain quality. Any visible bedding/dust is swept up.	Bedding is supplied in bales rather than in bulk. Bales are opened inside the housing rather than blown in to reduce dust. Wet straw may contain fungal spores. Weekly inspection by the operator.
	Slatted, part-slatted or straw-based systems in use	Although dust emissions may be higher from houses using straw-based systems, straw is applied carefully to minimise dust.	
Type of slurry/manure removal system	Ventilation is carefully controlled, maintained and monitored to meet animal welfare requirements and to ensure efficient productivity.		Pigs require careful control of airflow over them as they can be easily disturbed by draughts. Increased ventilation with fans is often used in summer months.
Ventilation	General management	Weekly inspection by the operator and any visible dust on fans, vents, etc. is removed.	
House cleaning	General management	Good house cleaning between batches is essential to reduce the volume and potential for air contamination within the house and via exhaust system.	Care is taken to avoid dust accumulation around exhaust vents. Cleaning takes place in such a way that does not cause a release of dust to air or water, eg dust is not blown off-site or washed into surface water drains.

Source of dust	Example	How is reduction achieved?	Comments
Building layout and design	Natural and artificial ventilation	Specification and design of ventilation system to provide good air quality for the animals and staff.	Natural screens also reduce odour, noise and visual impact on the local environment. However, sufficient space is required and it can be difficult to retrofit. Screens and/or barriers must not be placed too close to buildings as this may impede good and effective ventilation.
	Housing is designed to minimise the effect of high winds	Screens and wind breaks are used where possible.	
Dry filters	Collecting dust onto filters on exhaust vents	Cyclones are fitted to milling systems.	Can be used in pig houses when air change rates are relatively low and where the system will not interfere with the air distribution within the house. However, to remove anything other than large particles, it would need both a large and impractical surface area of filter, or very frequent cleaning/changing, which may prove impractical.
Electrostatic precipitation devices (ESP)	Attraction and collection of dust particles	ESP devices impart electric charges to dust particles. The electromagnetic force either pushes the particles out of the airstream into a collection tray, or attracts them to earthed surfaces.	Although construction is simple, operating costs are relatively low and airborne dust removal is significant, ESP devices require further development before they can be used to great effect within commercial pig houses, with large air change rates. An advantage is that no replacement filters are required.

Checklist

Options for dust and bioaerosol control at source and exhaust

Source of dust	Example	How is reduction achieved?	Achieved Yes/No	Comments	
Feed	Dust from silos	Covers put over feed silo pipes			
	Dust extraction in feed mill areas	Filters reduce dust emissions to the outside			
	Storage of feed	Use of covers for feed containers			
	Feed spill control	Collection of any feed spill is undertaken to avoid dust being generated			
	Form of feed	Wet feed used where possible			
	Feeding method		Hand feeding: sows and weaners are handfed to reduce dust		
			A material sock is fitted to the end of the auger pipe that delivers the feed directly into the bin		
			The internal feed bin is covered with a plywood-constructed top; the auger pipe is fitted through the cover		
	Over-administration of feed		Avoidance of spilled feed crushed on the floor by carefully monitoring the process		
Weekly inspection		Dust which is in danger of leaving the perimeter is swept up			
Bedding material	Application of bedding	Bedding is applied internally, rather than being blown in			
	Storage of bedding	Bedding is stored under cover			

Source of dust	Example	How is reduction achieved?	Achieved Yes/No	Comments
	Weekly inspection	Any stray bedding is swept up		
Slurry/manure removal systems	Part- or fully-slatted systems	Slatted systems are used where possible		
Ventilation	Natural or fan ventilated	Ventilation is carefully controlled, maintained and monitored		
	Weekly inspection	Any visible dust on fans and exhaust outlets is removed		
House cleaning	Good management	Thorough cleaning between batches		
Building layout and design	Artificial ventilation	Artificial ventilation is carefully controlled, maintained and monitored		
	Natural ventilation	Screens and wind breaks kept in good order		
Dry filters	Collecting dust onto filters on exhaust vents	Cyclones and dust socks are emptied at prescribed intervals		
Electrostatic precipitation (ESP) devices	Attraction and collection of dust particles	Dust particles are collected in a tray or attracted to earthed surfaces		
Scrubbers	Biofilters and wet scrubbers (water and acid)	Air passes through a water scrubber to remove the larger dust particles. Air is then passed over moistened beds of plant material, removing dust, odour, microbes and pathogens. In the sulphuric acid filter scrubber, 99% of ammonia molecules and other odorous compounds can be removed		

Appendix 1: Dust, bioaerosol and fugitive emissions complaint form

Introduction

Date	Name and details of person making the complaint	Nature of complaint	Action taken

Complaints will be responded to within days (or, refer to standard complaints procedure for the installation, staff training, etc).

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