



## DUST & BIOAEROSOL PLAN FOR WOOD LANE FARM

### 1 Background

#### 1.1 Introduction

This Plan has been prepared to establish the main sources of dust and bioaerosols at Wood Lane farm and the likely impacts of these on local sensitive receptors. Control and monitoring measures are also described, together with the procedures in place for responding to any complaints received.

The Plan is based on specific guidance on dust control from poultry units published by the Environment Agency<sup>1</sup>. In addition, account is taken of additional information on the gov.uk website<sup>2</sup> regarding 'permitted' sites, which states that a dust management plan must include:

- Version number and date;
- An introduction to the site and a description of site operations;
- A site plan.

The plan must provide details of:

- Local sensitive receptors;
- Other local contributors of dust and emissions;
- Emissions sources on site;
- Site abatement systems, including the nomination of responsibility;
- Contacts with the local community;
- The way in which complaints are handled;
- Arrangements for monitoring dust.

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<sup>1</sup> How to comply with your environmental permit for intensive farming. Appendix 11: Assessing dust control measures on intensive poultry installations.

<sup>2</sup> <https://www.gov.uk/guidance/control-and-monitor-emissions-for-your-environmental-permit#emissions-management-plan-for-dust>



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## **1.2 Site Introduction and Activities**

Wood Lane Farm is an established poultry farm located 1.2km North West of Great Ellingham in Norfolk (NR17 1JH). It was previously operated by Copperfield Enterprises Ltd and reared up to 130,000 ducks. It will be operated by Banham Poultry (2018) Ltd and there are six poultry houses on the farm hold 350,000 broiler chickens.

In the past, all six houses were used to grow ducks for meat. In the future, all six houses will be stocked with broiler chickens for meat. Chicks will be brought onto Wood Lane Farm at 1 day old and they will remain there until 42 days old, when the houses will be emptied and cleaned. After a gap of seven to ten days, the houses will be stocked with new day old chicks. For biosecurity reasons, the farm will be operated on a 'single-age' basis, so all six houses will be stocked and depopulated at approximately the same time.

## **1.3 Local Sensitive Receptors**

Wood Lane Farm has sensitive receptors within 300 metres of the site. The map below identifies the location of nearby residential properties.



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The potential impacts of dust on sensitive receptors include the following:

- Loss of amenity, particularly outside local properties;
- Stress and annoyance;
- Possible impacts on property values;
- Changes to local ecosystems.



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In addition, it is understood that in some circumstances, there are perceived detrimental human health impacts due to dust but any commentary on this is outside the scope of this plan.

The farm will run minimum ventilation rates within the houses, based on bird numbers and liveweight in order to provide sufficient fresh air to the birds. This will be closely monitored daily by staff and checks of dust levels and environment will be made approximately three times a day. Staff will check and adjust ventilation as the birds increase in weight. During warmer weather, ventilation rates will automatically increase in stages, with more extractor fans operating as ambient temperature increases. This will allow heat to be removed as needed from the buildings.

Regular ammonia testing will be done to monitor levels in the poultry houses. The aim is for the litter on a poultry broiler farm to be dry and friable, since this is consistent with good welfare and to allow the birds to express their natural behaviour of dust bathing.

## **2 Sources of dust and bioaerosols on site**

The main sources of dust and bioaerosols from the site are as follows:

- Poultry bedding/litter within the house;
- Feed;
- Livestock (e.g. feathers, skin particles);
- Activities relating to the removal of used litter and manure;
- Activities relating to other aspects of house cleanout.

Environment Agency guidance (see section 1.1) states that '*dust from poultry houses mainly originates from feathers, skin particles and used litter, and to a lesser extent from feed, bedding, micro-organisms and fungi*'.

Transmission of dust and bioaerosols to nearby sensitive receptors is via the atmosphere. The extent of transmission is dependent on atmospheric conditions such as windspeed and direction. In addition, a wide range of management factors are important, such as litter type, feed formulation and presentation, house ventilation systems, stock activity levels and cleanout methods. Staff are trained on minimising dust and terminal cleanout operations are planned to minimise dust emissions. Records are kept showing that dust emissions are monitored at certain times throughout the flock. All ventilation equipment is checked daily to ensure that it is all working correctly, feed spills and other spillages are cleaned straightaway and bagged.



### **3 Monitoring dust emissions**

Dust monitoring is carried out on at least a quarterly basis using a handheld Dust Monitor PCE-RCM 10. This frequency allows account to be taken of potential seasonal effects e.g. differences between summer (when ventilation rates are high) – and winter. In addition, different production stages and farm activities are monitored over time. For example, differences between the early and later stages of the production cycle and the impacts of house clean-out at the end of each flock cycle.

Monitoring will be carried out at various points along Bow Street. The results will be recorded on the Dust Assessment Form (FEM120v01). The monitoring will be carried out by personnel from BPL's Technical & Agriculture Department.

### **4 Responsibilities and complaints procedures**

The environmental complaints form will be used to investigate and record any reported dust problems.

### **5 Frequency of plan review**

This dust and bioaerosols plan will be reviewed on at least an annual basis and after any substantiated dust complaint. The effectiveness of this plan and the measures contained are the responsibility of the operator.

### **6 Emission sources and control measures**

The following tables list the likely sources of dust from the site and control measures for consideration and adoption. Comments are also included to provide additional detail and context for Wood Lane Farm.

Table 1 concentrates on control of dust 'at source'. This is based on Environment Agency guidance (see section 1.1) which also notes that some of these *'are limited in the amount of dust they can remove'*. Table 2 considers controls at the point of exhaust from the buildings which cover ventilation rates and locations and ways of trapping dust. Environment Agency guidance recognises that the latter (exhaust cleaning systems) *'require a significant capital cost'*.



**Table 1 Dust sources and control measures**

Source of Dust	Method	How can reduction be achieved	Comments for Wood Lane Farm
<b>Poultry Feed</b>	<u>Dust from silos</u>	Covers put over feed silo pipes.	Dust is collected from the silo exhaust pipe during delivery. Cyclone filters or even used overalls are considered very effective at removing dust from the air stream.
	<u>Dust extraction in feed mill areas</u>	Filter reduces dust emissions to the outside.	No on-site milling of compound feeds, so this does not arise.
	<u>Storage of feed</u>	Use of covers for feed containers.	Feed delivery systems are sealed to minimise atmospheric dust emissions.
	<u>Feed Spill Control</u>	Collection of any feed spilt is undertaken to avoid dust being generated.	Any spillage of feed around the bin is immediately swept up, either by the lorry driver or by farm staff.
	<u>Form of feed</u>	Blended laying meal.	Feed is delivered mainly in pellet form which is considered most suitable for broiler birds, which have a specific dietary requirement. Feed is delivered from the external bins into the houses once a day.
	<u>Fat Content</u> <u>Spraying oil or water mist onto feed</u>	Increase fat content so that dusty ingredients are bound together.  This mainly prevents particles on surfaces from becoming airborne again	Diets are formulated to meet the needs of the birds based on formulations provided by nutrition specialists. The fat content is specified and varies depending on the stage of the diet.  The practice of spraying oil or water onto feed is not carried out on the site. It is not considered appropriate for feed for broiler flocks.



Source of Dust	Method	How can reduction be achieved	Comments for Wood Lane Farm
<i>Poultry Feed (continued)</i>	<u>Feed ingredients</u>	Both wheat and barley have been found to be dustier than maize.	Maize is not normally an economical alternative to wheat, which is preferred to barley since barley requires added enzymes to aid digestion in the birds. Feeds are formulated by an external nutrition specialist. Inclusion levels of certain raw materials may be specified.
	<u>Feeding method</u>	Hand feeding is preferable to screw auger systems and automatic feeders, which can produce increased dust levels. Fit a material sock to the end of the auger pipe that delivers the feed directly into the bin. Cover the internal feed bin, e.g. with plywood constructed top and fit the auger pipe through the cover. Feed pans may be preferable to tracks.	Hand feeding is not practical on commercial scale poultry units.  The exhaust of the auger /feed system is covered.  The internal feed bin could be covered if a problem was suspected.
	<u>Over administration of feed to birds</u>	Avoid spilled feed crushed on the floor into particles which become airborne.	Birds are fed ad lib via pan feeders. There is very low risk of spillage but feeding systems are regularly checked for damage by farm staff.
<b>Bedding material</b>	<u>Type of bedding</u>	Sawdust and flax straw have been found to produce less dust than wheat, barley, or rye straw.	Sawdust or wood shavings are the preferred/main bedding, since they are effective in absorbing moisture and they are suited to the welfare needs of the birds. The quality of each consignment is checked to ensure that dust levels are acceptable.
	<u>Treatment of bedding</u>	Dust from straw can be reduced effectively if the straw is humidified prior to application.	



<i>Bedding material (continued)</i>	<u>Amount of bedding</u>	<p>Deep bedding systems have been shown to contribute less dust to the environment than shallow bedding systems.</p> <p>Bedding is applied internally, no storage of litter outside the houses.</p>	<p>Bedding is applied at an even rate across the floor at the start of the laying cycle. There is no external 'loose' storage of either new or used litter outside the poultry houses at any time.</p>
	<u>Application of bedding</u>	<p>Fit catching curtains when unloading and when putting bulk bedding into the housing.</p>	<p>All topping up of litter is carried out by opening sealed packaging inside the houses.</p> <p>Catching curtains are used.</p>
	<u>Age of bedding</u>	<p>As bedding materials break down to a dry friable litter, dust production increase.</p>	<p>Fresh bedding is used for each crop cycle. Litter is maintained to be loose and friable as recommended in "How to Comply 2" page 24 and to meet welfare needs. It is recognised that bird activity levels can be a contributory factor to litter-associated dust levels and this is addressed elsewhere in this table.</p>
<b>Relative Humidity</b>	<u>Increasing humidity</u>	<p>Using misting systems to increase the humidity at low ventilation rates has been shown to reduce inhalable dust.</p>	<p>This practice may not always be compatible with bird welfare and odour control management and so is not adopted.</p>
<b>Ventilation</b>	<u>Increasing ventilation</u>	<p>An effective method is by significantly increased and controlled airflow velocities.</p> <p>Increasing ventilation above minimum standards.</p> <p>Roof fans pull air through side inlets and distribute air across the birds, evenly distributing it around the house.</p> <p>Eliminating dust and odour and helps with keeping humidity levels rising in warmer weather.</p>	<p>Ventilation systems are operated at the optimum rate for bird welfare, using high velocity roof extract fans. This system is designed to increase atmospheric dispersion of dust extracted from the houses so that there is a rapid 'dilution' effect. Trees close to the poultry houses can also provide some screening.</p> <p>Visual checks on air quality within the houses are carried out at least three times a day alongside other welfare assessments.</p>





<b>House cleaning</b>	<u>Good management</u>	Good house cleaning between flocks is essential to reduce the volume and potential for air contamination within the houses	Housing is thoroughly cleaned/disinfected between one crop and the next. A period of around 7 to 10 days is typically allowed so that comprehensive cleaning can take place.
	<u>Dust removal by vacuum cleaner</u>	<p>In-house dust removal by vacuum cleaner when the birds are in situ, reduces dust that could be disturbed by ventilation and emitted.</p> <p>Fans can be cleaned from the outside so that dust settles within the house. After flock depopulation, litter may be damped down prior to removal. Litter is loaded into a trailer which is then covered and moved immediately off site. No used litter or manure is kept or stored on site.</p>	<p>The use of cleaning systems with birds in place is unlikely to be practical because it would cause disturbance. This in turn would increase activity levels and thus dust emissions outside the house would be expected to increase.</p> <p>A thorough terminal clean out plan has been prepared which incorporates fan cleaning and litter removal since these are recognised to be important in terms of dust control.</p>
<b>Genotype</b>	<u>Animal activity</u>	<p>Birds that exhibit higher activity levels are likely to create more dust in the air from the litter.</p> <p>The operator will manage flocks such that over-activity and disturbance does not cause dust generation during the production cycle;</p> <p>Light intensity affects bird activity levels and can influence dust levels. It is maintained at acceptable levels by light-proofing and by controlling artificial light intensity within the houses.</p> <p>All possible steps will be taken to avoid disturbance to the birds which increase activity levels, whether through sudden noise, predators and / or unusual activities. This is consistent with good welfare and optimal performance.</p>	<p>Management inputs at Wood Lane Farm are based around maintaining a suitable environment within the houses and on establishing good routine working patterns.</p> <p>The importance of both light source and light intensity within the houses is understood by farm staff and it is regularly checked.</p> <p>Work practices to minimise disturbance to the birds include using the same staff (where possible) for in-house activities each day, wearing similar dark-coloured clothing and walking slowly through the flock.</p>



		The activities of catchers at the time of flock depopulation will be monitored by the operator to ensure that the work does not lead to excess dust levels.	External noise (which could cause disturbance in the houses) will be controlled where possible e.g. any repair work which may create noise will be undertaken whilst the houses are empty, where possible. It is recognised that some external noises that could cause disturbance (e.g. low-flying aircraft) are outside site control.
<b>Number of birds</b>	<u>Reduced flock numbers</u>	Less birds, less feed, less litter means less activity to produce airborne dust	The reduction in stocking density can be considered as a last resort if all other interventions are unsuccessful.
<b>Complaints</b>	<u>Complaints procedure for incidents related to dust.</u>	Please refer to Complaints and Incidents Reporting and Investigation Procedure EMS092.	Due to the distances involved to any sensitive receptors BPL would not expect to receive complaints related to dust generation on-site.