

Ref: DBMP

## **Dust & Bio-aerosol Management Plan**

### Site particulars

The site layout shows the laying cabins are located north of the site. Laying shed 1 is located 22 metres north of the managers lodge. The prevailing wind is from the west and south/west. Average wind directional data shows Lancaster (closest available) has less than 5% wind from the north.

A side porch area is positioned on the western side of the lodge and is the principle entry point to the lodge. Sliding glass doors on the north are seldom used. The garden area is to the south and lawned area to the west.

**Laying shed 1** The shed is ventilated by an extraction point to the north of the shed at 117m. The southern part of the shed is an egg packing room with a single internal personnel door to the flock area. Vents are positioned along the ridge, the closest approximately 55 metres from the lodge.

Like all well run laying units flock management is predicated on a management system which maintains a calm environment for the flock. Staff are dedicated to this aim and all operations are carried out calmly and quietly.

**Measures to minimise problems of dust and bio-aerosol particles include control at source and exhaust.**

### **Source controls applied**

#### **Poultry feed .**

Purchased compounded mash feed is purchased from a specialist supplier. A total of 6 feed silos serve the laying units Dust socks are used when feed is delivered on all silos.

An automatic auger system delivers feed to a conveyer system. Covered containers are in place where feed is delivered. The system is monitored as part of daily management to ensure no spillages and overfilling takes place.

#### **Bedding**

Wood shavings are used as bedding material and produce little dust. A key management objective is to maintain a calm environment for the flocks. All activities within the sheds are carried out as quietly and calmly as possible. Disturbance is minimised and bedding is taken into the buildings by a small trolley.

Good ventilation is critical and humidity is monitored.

Pelleted compounded feed is purchased from a specialist supplier and quality is monitored.

Screens and wind breaks are present on the western foraging side of the buildings.

**Exhaust controls applied**

Effective source controls ensure minimal dust emissions . The wind direction is an important aspect on this unit. Located directly south of the nearest shed wind borne dust and bio-aerosols are rare.

Checklist 1 – Options for dust control at source

Source of dust	Method	How is reduction achieved?	Achieved Yes/No	Comments	
Poultry feed	Dust from silos	Covers put over feed silo pipes.	✓	Dust socks used	
	Dust extraction in feed mill areas	Filters reduce dust emissions to the outside.	NO	No feed milling on site	
	Storage of feed	Use of covers for feed containers.	YES	Feed containers covered	
	Feed spill control	Collection of any feed spill is undertaken to avoid dust being generated.	YES	Part of general management	
	Form of feed	Mould feed into pellets so that dusty ingredients are bound together.	YES	Compounded feed brought in	
	Fat content	Increase fat content so that dusty ingredients are bound together.	N/A	Compounder manufactures	
	Spraying oil or water mist onto feed	Mainly prevents particles on surfaces from becoming airborne again by making them too heavy.	NO	No requirement - excellent pellet quality	
	Feed ingredients	Both wheat and barley have been found to be more dusty than maize.	N/A	Compound <del>is</del> wash	
	Feeding method	Hand feeding is preferable to screw auger systems and automatic feeders, which can produce increased dust levels.		N/A	Aerated system
		Fit a material sock to the end of the auger pipe that delivers the feed directly into the bin.		NO	Covered with lids
		Cover the internal feed bin, e.g. with a ply-wood constructed top, and fit the auger pipe through the cover.		YES	Internal bins covered
		Feed pans may be preferable to tracks.		N/A	
	Bedding material	Over administration of feed to birds	Avoid spilled feed crushed on the floor into particles which become airborne.	N/A	No alternatives to sustain
Type of bedding		Sawdust and flax straw have been found to produce less dust than wheat, barley or rye straw.	YES	Good quality <del>wood shavings</del>	
Treatment of bedding		Dust from straw can be reduced effectively if the straw is humidified prior to application.	NO	Not bare required	

Source of dust	Method	How is reduction achieved?	Achieved Yes/No	Comments
	Amount of bedding	Deep bedding systems have been shown to contribute less dust to the environment than shallow bedding systems.	NO	
	Application of bedding	Bedding applied internally.	YES	
	Age of bedding	Fit catching curtains when unloading and augering bulk bedding into housing. As bedding materials break down to a dry friable litter dust production increases.	NO	Bedding delivered by
Litter systems	Use of cage systems for layers	Dust emissions were much higher from houses using litter rather than cages with wire floors.	N/A	Regular cleaning of long/soaking trees
Relative humidity	Increasing humidity	Using misting systems to increase the humidity at low ventilation rates has been shown to reduce inhalable dust.	N/A	Not exceed system
Ventilation	Increasing ventilation	An effective method is by significantly increased and controlled airflow velocities.	NO	Good ventilation in place
House cleaning	Good management	Good house cleaning between flocks is essential to reduce the volume and potential for air contamination within the house and via exhaust systems.	YES	Controlled as required
	Dust removal by vacuum cleaner	In-house dust removal by vacuum cleaner when the birds are in situ, reduces dust that could be disturbed by ventilation and emitted.	N/A	Calm environment to reduce dust levels
Genotype	Animal activity	Birds that exhibit higher activity levels create elevated levels of dust in the air.	NO	Paint in calm environment
	Feather crunchiness	Greater feather crunchiness causes increased dust levels at moulting periods.	N/A	Mounting NOT Allowed in UK.
Number of birds	Reduced flock numbers	Less birds, less feed, less litter means less activity to produce dust airborne.	N/A	Numbers appropriate to space requirements
Crop cycle length	Lower final body weight	Birds grown to a shorter cycle length and lower weight produce less dust as most dust is emitted from day 20.	N/A	Laying flock 15 month cycle

## Checklist 2 – Options for dust control at exhaust

Dust control	Method	How is reduction achieved?	Achieved Yes/No	Comment
Screens and wind breaks	Natural and artificial vents	Rely on exhaust air directed towards them, typically from end-wall mounted systems, so that dust particles intercepted and air lifted into the atmosphere for better dilution and dispersion. Vegetative screens seen to reduce dust levels by approximately 50%.	NO	Ventilation fan exits closest building 117 meters from residence (Managers lodge)
Dry filters	Collecting dust onto filters on exhaust vents	Dry filters can be fitted to internal air recirculation units.	NO	
Electrostatic precipitation devices (ESP)	Attraction and collection of dust particles	ESPs impart electric charges to dust particles. Dust particles collected in a tray, or attracted to earthed surfaces.	NO	
Passive dry air cleaning units	Filter panels that collect dust across the width of the house	Fans are located in the end-wall of the house, in front is a plenum chamber fitted with linked filter panels making a filter wall. As air is drawn through to the fans the filter separates the dust into collection pockets that can be emptied. Commercial results suggest a 70% reduction in visible exhaust dust.	NO	
Active wet cleaning units	End-wall ventilated systems	Water air-cleaning units intercept dust as air passes through a water or chemical spray, often over a pad matrix.	NO	
	Roof ventilated systems	Water is sprayed over the exhaust air from exhaust chimneys, binding the dust. All units are connected together and used water falling on the roof goes to central acidified treatment basin where odour and ammonia molecules are trapped. Requires the air pressure to be more than 30 Pa.	NO	
Scrubbers	Bio-filters and acid-filters	Air passes through a water scrubber to remove the larger dust particles. Next, in the bio-filter system the air is 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.	NO	

