Dust & Bio-aerosol Management Plan for Methwold (Breckland) Farm Poultry Unit

Poultry dust may vary in composition from pure wood dust to a complex mixture of organic and inorganic particles, faecal material, feathers, dander (skin material) and bioaerosols – dust particles containing living organisms including mites, bacteria, fungi and fungal spores and endotoxins depending on the type of birds, the work activity, and the point in the growing or production cycle.

The H1 Environmental Risk Assessment submitted with an application to vary the permit to extend the installation boundary and demolish all existing buildings to erect 20no new houses for rearing poultry identified sources of dust and bioaerosols with moderate and minor potential to cause annoyance. Created and updated this dust and bioaerosol management plan (DMP) to support the overall environmental management system in place at Methwold (Breckland) Fm. The overriding principle is to ensure day-to-day activities are carried out in accordance with the plan so there is no reasonable cause for annoyance to people outside the installation boundary. Significant pollution outside the boundary is not expected, operator has no record or recollections of any dust concerns or complaints and will continue to foster good relations with neighbours.

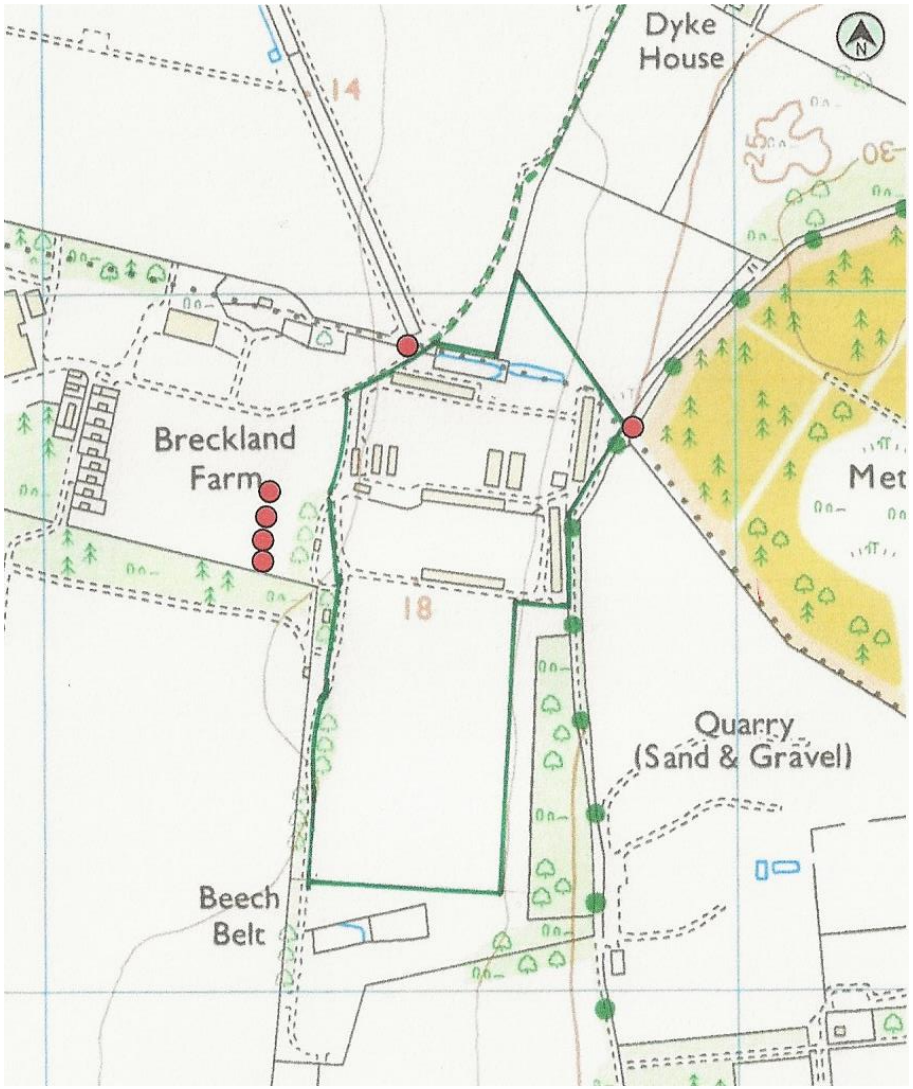
Actions and contingency actions in this DMP are best available techniques (BAT) in accordance with Best Available Techniques (BAT) Reference Document 2017, Environment Agency (2010) EPR 6.09 Sector Guidance Note; How to comply – Intensive Farming v2 Appendix 11 Assessing dust control measures on intensive poultry installations, Health and Safety Executive (2012) Controlling exposure to poultry dust, guidance for employers, and DEFRA (2018) Code of practice for the welfare of meat chickens and meat breeding chickens.

Identified receptor locations potentially sensitive to dust and bioaerosols within 100m of the installation boundary from a site walkover and desk top study including 4no proposed residential dwellings for farm workers at Methwold (Breckland) Fm shown in Table 1 and Figure 1.

Table 1. Methwold (Breckland) Fm Poultry Unit receptor locations within 100m

Nº.	Receptor	NGR	Direction	Distance from boundary
1	Public right of way - Brandon Road, Methwold, Thetford	TL 73852 92803	N	0m
2	Other public access - Brandon Road, Methwold, Thetford	TL 73558 92926	NE	0m
3	Residential – Breckland Farm, Lodge Road, Feltwell, Thetford, IP26 4DU	TL 73361 92699	W	80
4	Residential – Breckland Farm, Lodge Road, Feltwell, Thetford, IP26 4DU	TL 73353 92677	W	80
5	Residential – Breckland Farm, Lodge Road, Feltwell, Thetford, IP26 4DU	TL 73345 92653	W	80
6	Residential – Breckland Farm, Lodge Road, Feltwell, Thetford, IP26 4DU	TL 73340 92628	W	90

Fig 1. Methwold (Breckland) Fm Poultry Unit receptor locations within 100m



Wind direction is defined as the direction from which the wind is blowing. According to the Met Office Eastern England climate report - as Atlantic depressions pass by the UK the wind typically starts to blow from the south or south-west, but later comes from the west or north-west as the depression moves away. Directions between south and north-west account for the majority of occasions and the strongest winds nearly always blow from this range. Averaged across the year the prevailing wind direction is from the southwest.

Residential dwellings likely have high sensitivity – reasonably expect enjoyment of a high level of amenity, and where people would reasonably be expected to be present continuously, or at least regularly for extended periods. However, will not be exposed to dust or bioaerosols for the majority of occasions.

Public rights of way likely to be exposed to be exposed to dust and bioaerosols for the majority of occasions. However, likely have low sensitivity – where the enjoyment of amenity would not reasonably be expected, or there is transient exposure, where the people would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use.

The following table sets out:-

- Sources of dust & bioaerosols from a typical intensive poultry unit
- Actions taken at Methwold (Breckland) Fm to prevent or minimise dust levels
- Contingency actions to limit exposure to elevated dust and bioaerosol emissions beyond the installation boundary.

Table 2. Actions and contingency actions to minimise dust & bioaerosols at Methwold (Breckland) Fm Poultry Unit

Source of dust & bio-aerosols	Potential risks and problems	Actions to minimise dust and bioaerosols and risks	Contingency actions to minimise dust and bioaerosols and risks
Dust from manufacture & feed selection	• Milling & mixing compound feed • Feed ingredients • Fat content	• No feed manufacturing, milling, or mixing on site. • Feed specifications prepared by the compounders nutrition specialist and continually monitored. • Feeds supplied from mills in certification schemes and only use approved ingredients.	
Dust from feed delivery & storage	• Dust from silos • Storage of feed • Feed spillage • Form of feed	• Package enclosed silos, pipes, augers and feeding equipment installed minimises spillage, dust & odour. • Feed silos protected from collision damage by careful siting relative to traffic flows - in between the poultry houses keeps them out of path of HGVs, and easily connected to the trailer so blowing feed over as short a distance as possible and minimises dust creation. • Feed delivery vehicles always covered minimising release of any dust and odour. • Deliveries monitored by drivers and stockman, and any spillage cleared up immediately. • Use compound feedstuff in pellet form, crumbled at mill for first 2 weeks for chicks. • Use pan feeders & feed chickens ad-libitum, reducing dust creation and bird activity, compared to using track and other feeders. • Stockman inspecting automatic equipment on which chickens depend not less than once per day to check there no defects, any defects repaired immediately or same day by stockman, maintenance, or professional contractors.	Trigger • Feed spillage anytime. Timeframe for implementation • Immediately/same day. Contingency action • Spillage will be cleared up immediately into bags by drivers or stockman and stored in a secure place to prevent dust, & access by pests, for offsite disposal. • Stockman will have to arrange a waste carrier to provide a covered skip same day for a large spillage considered to be too much for packing into bags. • Any feeder defects repaired immediately same day or as soon as possible. Duration of action • Achievable same day. Cessation of action • Spillage cleared up and delivered or secured for offsite disposal.

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Source of dust & bio-aerosols	Potential risks and problems	Actions to minimise dust and bioaerosols and risks	Contingency actions to minimise dust and bioaerosols and risks
		• Maintain an inspection and preventive maintenance programme on buildings & equipment with stockman, maintenance team or professional contractors and keep records.	
Dust & bioaerosols from ventilation fans	• Dust may contain large amounts of bird proteins and mite residues with high risk of respiratory sensitisation for workers inside poultry houses. • Increasing ventilation may reduce airborne dust inside the house, but still exhausts dust to outside.	• Forced ventilation via side inlets and high velocity extraction fans, with outlets on the roof (vents greater than 5.5m high and efflux velocity greater than 7m/s). • Computer controlled and regularly adjusting to match age, weight, and health requirements of the chickens. • Optimising discharge conditions of exhaust air from poultry houses using a combination of techniques to disperse ammonia, odour, and dust emissions quickly. Maximised outlet heights – exhausting air above roof level through the ridge, maximised vertical outlet velocity - designed with uncapped outlet cones. • Stockman inspecting automatic equipment on which chickens depend not less than once per day to check there are no defects. Any defects to be repaired immediately or on the same day by the stockman, maintenance team or by professional contractors. • Clearing build-up of dust with compressed air from around vents, fans, ceilings, and feeding equipment end of every cycle and washout. Also helps reduce the quantity of dirty water produced. • Maintain an inspection and preventive maintenance programme on buildings & equipment with stockman, maintenance team or professional contractors and keep records.	

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Source of dust & bio-aerosols	Potential risks and problems	Actions to minimise dust and bioaerosols and risks	Contingency actions to minimise dust and bioaerosols and risks
Dust issues with gable end fans used in warmer weather	• Increasing ventilation may reduce airborne dust inside the house, but still exhausts dust to outside. • Dust emissions are closer to the ground. • More frequent extreme weather events are to be expected result of climate change. Summer daily max. temperature may be around 7°C higher by 2050 compared to average summer temperature now. Expect hotter and longer heat waves. .	• Gable end fans to provide tunnel ventilation and/or evaporative cooling units to cool incoming air in warmer weather to be considered in design stage at Methwold Fm. Based on successful results using evaporative cooling units on a poultry farm in Norfolk.	Trigger • Warm weather or a heatwave is forecast, mostly in June, July & August, and near the end of growing periods when chickens are fully feathered. • Met Office definition for UK heat wave is an extended period of hot weather for 3 consecutive days with daily maximum temperatures meeting or exceeding the heat wave temperature threshold of 27^{o}C for Norfolk. Timeframe for implementation • Fans switched on immediately as soon as chickens start exhibiting uncomfortable feeling hot behaviours, e.g., lifting their wings and exposing more of their bodies to get rid of excess heat, and panting. Chickens heat shedding mechanisms become less and less effective, and if the situation isn't controlled, they will die. Contingency action • The additional tunnel ventilation gets air moving close to the floor and over chickens, so wind chill helps them cope with high temperature. • Chickens are always nearly fully feathered, never use gable fans while brooding chicks & younger birds, which would be chill stressed. • Gable end fans not directed towards any residential receptors, and external deflectors direct exhaust air & dust on to the ground. • Grass sward under fans helps creates turbulence and increase dust deposition on the ground.

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Source of dust & bio-aerosols	Potential risks and problems	Actions to minimise dust and bioaerosols and risks	Contingency actions to minimise dust and bioaerosols and risks
			<u>Duration of action</u> • Running fans continually day & night during warmer outside temperatures. Chickens can tolerate higher daytime temperatures if the night time temperature drops 14^{o}C or more below daytime highs. During the cool night time chickens can get rid of excess body heat built up during the day. Running fans to move air over the chickens can also help reduce 'effective' night time temperature. So, chickens can start the next day fresh, which helps keep performance up and lessen risk of mortalities if day time temperatures are high again. • Based on a production cycle of approximately 7 weeks, fans might be used at the end of 2 cycles for up to approximately 7 days each or up to 14 days in hottest 3 months each year. • Heatwaves will become more frequent. According to Agency adapting to climate change risk assessment summer daily maximum temperature may be around 7^{o}C higher compared to average summer temperature now by 2050, or sooner. <u>Cessation of action</u> • Fans switched off as soon as they are not required, when daytime outside temperature goes down and chickens stop exhibiting uncomfortable feeling hot behaviours. • Fans never used any other time for example during litter removal and washout.

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Source of dust & bio-aerosols	Potential risks and problems	Actions to minimise dust and bioaerosols and risks	Contingency actions to minimise dust and bioaerosols and risks
Evaporative cooling units used to cool incoming air in warmer weather	More frequent extreme weather events are to be expected result of climate change. Summer daily max. temperature may be around 7°C higher by 2050 compared to average summer temperature now. Expect hotter and longer heat waves.	• Evaporative cooling units to cool incoming air and/or gable end fans to provide tunnel ventilation in warmer weather to be considered in design stage at Methwold Fm. Based on successful results using evaporative cooling units on a poultry farm in Norfolk. • Evaporative cooling units installed next to ordinary air inlets on side of houses. Extraction fans on the roof draw warm outside air through saturated filter pads and as the water evaporates, energy is lost and significantly reduces the incoming air temperature and the temperature inside the house. • Expect negligible change in dust issues in ventilation system when using evaporative cooling units.	Trigger • Warm weather or a heatwave is forecast, mostly in June, July & August, and near the end of growing periods when chickens are fully feathered. • Met Office definition for UK heat wave is an extended period of hot weather for 3 consecutive days with daily maximum temperatures meeting or exceeding the heat wave temperature threshold of 27^{o}C for Norfolk. Timeframe for implementation • Evaporative cooling units switched on immediately as soon as chickens start exhibiting uncomfortable feeling hot behaviours, e.g., lifting their wings and exposing more of their bodies to get rid of excess heat, and panting. Chickens heat shedding mechanisms become less and less effective, and if the situation isn't controlled, they will die. Contingency action • Evaporative cooling units significantly cool the incoming air and the temperature inside the house. • Chickens are always nearly fully feathered, never use cooling units while brooding chicks & younger birds, which would be chill stressed. Duration of action • Running cooling units continually day & night during warmer outside temperatures. • Based on a production cycle of approximately 7 weeks, cooling units might be used at the end of 2

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Source of dust & bio-aerosols	Potential risks and problems	Actions to minimise dust and bioaerosols and risks	Contingency actions to minimise dust and bioaerosols and risks
			cycles for up to approximately 7 days each or up to 14 days in hottest 3 months each year. • Heatwaves will become more frequent. According to Agency adapting to climate change risk assessment summer daily maximum temperature may be around 7^{o}C higher compared to average summer temperature now by 2050, or sooner. <u>Cessation of action</u> • Cooling units switched off as soon as they are not required, when daytime outside temperature goes down and chickens stop exhibiting uncomfortable feeling hot behaviours.
Dust issues with heat exchangers	• Dust deposition	• Package heat exchangers installed on all poultry houses provide ventilation for first 3 weeks of each cycle, then gradually changeover to fan extraction. Exchangers significantly reduce energy, odour, and airborne dust inside houses, and emissions outside. • Dust deposited inside heat exchangers washed out end of each cycle, and the dirty water drains via solid underground pipes direct to dirty water tanks for offsite disposal.	
Dust issues with litter quality	• Type of bedding • Treatment of bedding • Amount of bedding	• Proprietary blend of dust extracted chopped straw/wood shavings or chopped straw provides absorbent bedding. Dust extracted straw/wood shavings are commercially available, cost effective and readily disposed of end of each production cycle.	

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Source of dust & bio-aerosols	Potential risks and problems	Actions to minimise dust and bioaerosols and risks	Contingency actions to minimise dust and bioaerosols and risks
	• Application of bedding • Age of bedding	• According to How to comply sawdust and flax straw have been found to produce less dust than wheat or barley straw, but neither are normal UK industry practise for intensively rearing broiler chickens. • Plastic wrapped bales delivered direct into houses for unpacking and spreading evenly over entire floor area start of every growing period. • Dust filtration not installed but closing doors, opening vents for naturally diluting air, and switching on extraction fans to create effective airflow during litter placement is industry best practise to limit workers exposure to dust. • Use new litter every time, never reuse litter.	
Dust issues with bird activity	• Increased flock numbers • Birds exhibiting higher activity levels create elevated levels of dust in the air.	• Stockmen walk through houses every day to inspect chickens daily while disturbing them and litter as little as possible. • Use pan feeders & feed chickens ad-libitum, reducing dust creation and bird activity compared to using track and other feeders.	
Dust issues during destocking	• Fans & open doors • Increasing ventilation will reduce airborne dust inside but more dust	• Chickens reared in batches, all-in-all-out for biosecurity. Arrive onsite as incubated eggs or day-old chicks. Reared to around 31 days of age, then start destocking. A quarter will be removed, 'thinned', and transported to a local abattoir and remainder reared on to around 38 days of age. Normally 10 days washing-out & empty between batches so approx. 7.6	

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	exhausted outside.	batches per annum. Abattoir can slaughter 240,000 chickens per day so could take smaller birds in as little as a single day, but most likely over several days to supply customer's a broader range of weights. Remainder chickens could be taken in as little as 3 days. Expect to be destocking houses not less than 30 days every year. • Dust filtration not installed but closing doors, opening vents for naturally diluting air, and switching on extraction fans to create effective airflow during litter placement is industry best practise to limit workers exposure to dust. • Subdued lighting keeps birds calm during catching in a modular transport system to minimise disturbance, airborne dust, and odour. • Modules covered during transport to protect chickens and also contain dust and odour but expect to be uncovered in warmer weather. • Loaded trailers promptly moved offsite. • HGVs pass-by receptors but takes only seconds.	
Dust issues removing litter Generally considered the dustiest activity	• Ventilation fans & open doors • Increasing ventilation will reduce airborne dust inside but more dust	• Removing litter after destocking occurs 6/7 times every year. Contractor uses two teams to empty 3 houses each per day so expect all houses emptied in approx. 4 days. Expect to be removing & loading litter not less than 28 days every year. • Remove litter as soon as possible, normally within a day of destocking, not more than 3 days, for example destocking on a Friday and cleanout on Monday.	

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Source of dust & bio-aerosols	Potential risks and problems	Actions to minimise dust and bioaerosols and risks	Contingency actions to minimise dust and bioaerosols and risks
	exhausted outside.	• Remove litter in day time 07.00-23.00hrs in working week (Monday to Friday and Saturday morning but exclusive of public & bank holidays), in accordance with How to comply. • Ventilation reduced to a minimum during cleanout. Use shed ventilation to maximum effect to reduce workers dust exposure. Combination of opening or closing shed doors, opening vents for natural air dilution, and switching on ventilation fans to create required airflow during the different stages of litter removal is industry standard in accordance with HSE guidance. • Dust build-up around vents, fans, ceiling, and feeding equipment cleared with compressed air. Ventilation reduced to a minimum during cleanout so most dust drops on floor and removed with litter. Some will escape, especially when blowing fans but not considered to be significant contribution to air, water pollution compared with expected release during the rearing period. • Removing litter from floor using front end or skid-steer loader to shovel bulk of the litter carefully and directly off the floor into a large heap the length of the house to minimise time spent loading into waiting trailers positioned outside doors to avoid double handling. Doors will be open on to the concrete hard standing areas where the trailers will be parked, not in close proximity to receptors.	

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Source of dust & bio-aerosols	Potential risks and problems	Actions to minimise dust and bioaerosols and risks	Contingency actions to minimise dust and bioaerosols and risks
		• Used litter transported in covered trailers and kept covered at all times except during loading • Fans switched off and keep houses closed after removing litter. • Keep checking routine actions to minimise dust being adhered to until work finished. • Export litter offsite for power generation or land-spreading under control of a separate farming business, with a written agreement in place. • No used litter stored on site.	
Washout Generally considered least dusty of activities	• Ventilation fans & open doors	• Washout after removing litter occurs 6/7 times every year. Contractor uses two teams to wash 3 houses each per day so expect all houses washed in approx. 4 days. Equivalent to washing out not less than 28 days each year. • Washout houses as soon as possible, normally within one day of destocking, and not normally more than 3 days for example destocking on a Friday and washout out on Monday. Washout all the houses in as short a time as possible. • Stockman and contractor keeping roadways, areas around buildings, dirty water grates and drains clear of litter, etc to avoid backing-up, pooling, or over spilling into surface water drains or on unmade land. • Keep poultry houses closed & locked after washout.	
Monitoring		• Farm Manager responsible for site tour every day including perimeter, check for any indication of	Trigger • Abnormal, extraordinary, elevated dust levels. Timeframe for implementation

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		abnormal elevated dust level with potential to cause annoyance offsite.	• Immediate, same day. Contingency action • Check routine and contingency actions to minimise dust and risks being adhered to. • Inform people at receptor locations and anyone else likely to be seriously affected, what has been done or still needs to be done to reduce dust levels and duration with timescales. • Continue checking at perimeter, until dust reduced and back to normal. Duration of action • Normally achievable same day, next day. Cessation of action • Dust reduced, back to normal onsite & offsite. • Record events and actions in farm diary.
Complaint	• Wind direction exposing receptors to dust. • Receptor sensitivity likely to increase in warm weather when people want to enjoy their gardens and have windows open more. • Slow response	• Farm Manager, Environmental Manager responsible for investigating any complaint reported by Agency, local authority, or the public. • Investigate if alleged dust can be substantiated. Even if no longer apparent an investigation must still be carried out and recorded same day. Establish:- • Time event occurred, duration, description of dust. • Activities taking place onsite at time of complaint. • Any dusty activities taking place offsite in vicinity. • Record details of investigation and action taken on dust complaint report. A copy must be sent to the Agricultural Director immediately and must be	Trigger • Complaint reported on Saturday or Sunday by email from Agency, local authority, not considered likely from anywhere else. Timeframe for implementation • As soon as possible on opening email. Contingency action • Investigate if alleged dust can be substantiated. Even if no longer apparent investigation must still be carried out and recorded same day, next day. • Continue monitoring for dust. Duration of action • Investigation likely achievable same day, next day.

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	• Elevated level of annoyance.	retained onsite & available for future reference, or inspection with Agency.	Cessation of action • Notify Agency, local authority, complainant, anyone else likely to be seriously affected, same day as soon as possible result of investigation and corrective action or what still needs to be done with timescales.
Management plan review	• Update with new issues, actions & contingency actions.	• Environmental Manager responsible for review annually. Updated sooner where a substantiated complaint results in making changes to related issues change in operating procedures, or any routine and contingency actions.	

Change history	Date	Name
Last updated	31 May 2024	[redacted]
Last review	26 May 2023	
Next review	-	12 months from date of bringing poultry houses into use.
31/05/24 Corrected address and post codes for the proposed dwelling houses at Breckland Fm. 26/05/23 Created for rearing poultry at Methwold (Breckland) Fm in accordance with How to comply.		

Dust Complaint Report

Date	
Reference number	
Name and address of complainant	
Telephone number of complainant	

Time and date of complaint	
Date, time, and duration of offending dust	
Weather conditions *(e.g., dry, rain. Fog, snow)*	
Wind strength and direction *(e.g., light, steady, strong, gusting)*	
Callers' description of dust	
Has the caller any other comments about the offending dust?	
Any other previous known complaints relating to the installation (all aspects, not just dust)	
Any other relevant information	
Potential dust sources that could give rise to the complaint	
Operating conditions at the time offending dust occurred	
Actions taken	
Final outcome	
Complainant visited	
Complainant contacted with explanation Yes/No Date By whom	

Form completed by	Date:	Signed: