

## **Bioaerosol Management Plan**

**Site Name:** Carkin Moor Farm

**Operator:** S Ward and J Lee

**Permit number:** EPR/new

**Date:** August 2023

**Prepared by:** L Bentley

### **Introduction**

This bespoke Bioaerosol Management Plan has been prepared to support the overall Environmental Management System in place at Carkin Moor Farm. The overriding principle of this plan is to ensure the day-to-day activities are carried out in accordance with this document to help minimise the overall environmental impact. The farmhouse at Carkin Moor Farm and The Squirrels House are within 100m of the installation boundary. The only other neighbouring residence within 400m is Warrener House.

There are no historical complaints on record concerning operations on the site.

### **Setting**

The installation is located at National Grid Reference NZ 16515 08477. Please refer to Appendix 4 for site location, layout and installation boundary.

Figure 1 shows the location of the installation and of the receptors (with grid references) which have been considered in this management plan.

Figure 1: Buffer zone and sensitive receptors

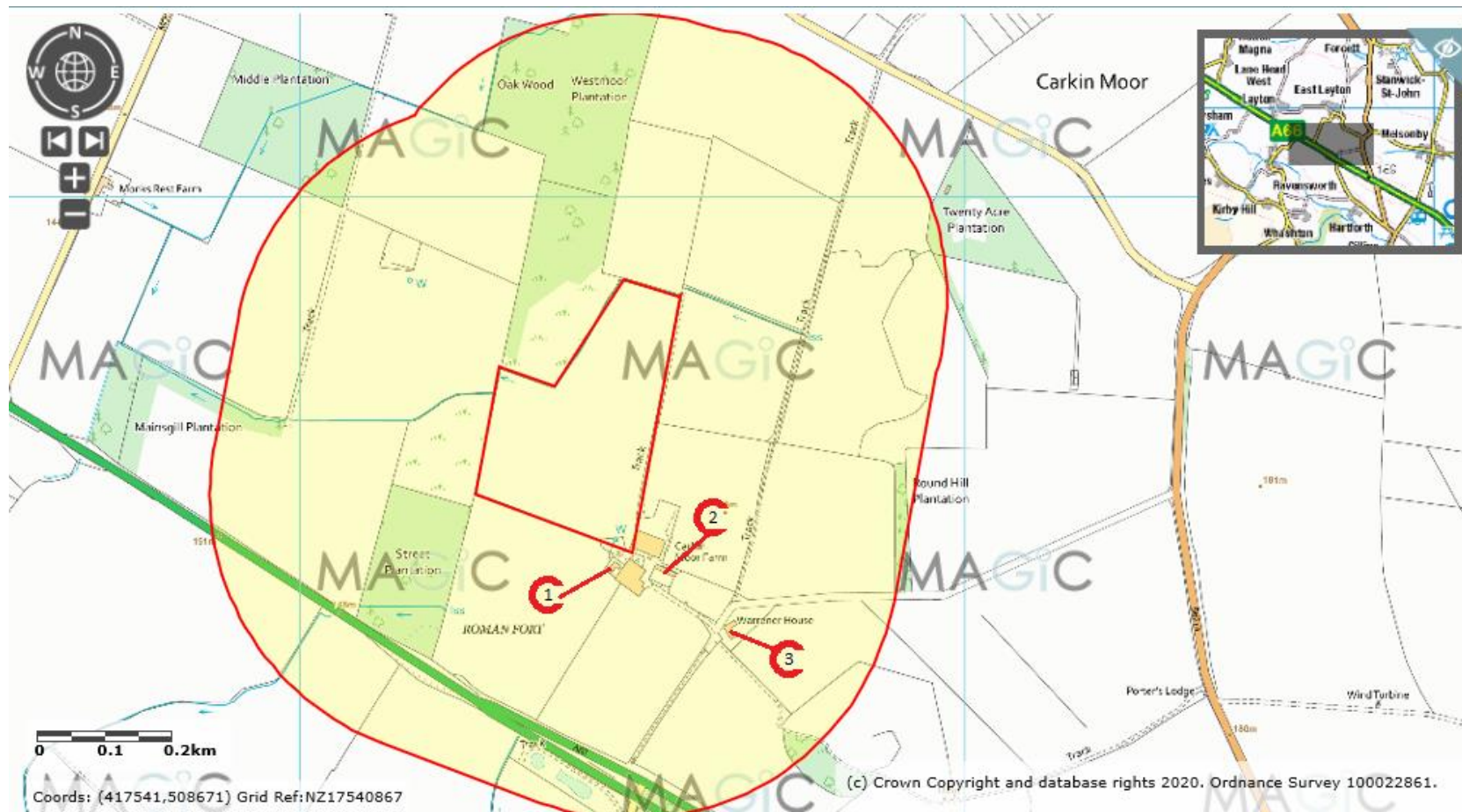


Table 1: Sensitive Receptor Locations

| Grid Reference | X (Eastings) | Y (Northings) | Latitude  | Longitude  | Description (Click to Edit) | Address | Postcode |
|----------------|--------------|---------------|-----------|------------|-----------------------------|---------|----------|
| NZ 16491 08678 | 416491       | 508678        | 54.473202 | -1.7470476 | Installation                | A66, C  | DL11 7PA |
| NZ 16467 08444 | 416467       | 508444        | 54.471097 | -1.7474173 | 1 The Squirrels House       | A66, C  | DL11 7PA |
| NZ 16554 08437 | 416554       | 508437        | 54.471030 | -1.7460807 | 2 Farm House                | A66, C  | DL11 7PA |
| NZ 16642 08353 | 416642       | 508353        | 54.470275 | -1.7447287 | 3 Warrener House            | A66, C  | DL11 7PA |

Table 2: Distance of Sensitive Receptors from Installation Boundary to nearest point of domestic curtilage

| Reference | Description         | Distance (m) | Operator owned? |
|-----------|---------------------|--------------|-----------------|
| 1         | The Squirrels House | 16           | Yes             |
| 2         | The Farm House      | 37           | Yes             |
| 3         | Warrener House      | 175          | No              |

The purpose of this Bioaerosols Management Plan is to:

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

### **Potential Bioaerosol sources**

In accordance with Section 3 of H4 guidance, a risk assessment of bioaerosols pollution was performed (Appendix 5).

As a result, the following sources have been identified as contributing to a potential *medium risk* bioaerosols source:

- Bioaerosol emissions from feed selection
- Bioaerosol emissions from feed delivery and storage
- Bioaerosol emissions from poultry litter removal (no storage on site; all exported)
- Bioaerosol emissions from yard areas
- Bioaerosol emissions from housing
- Bioaerosol emissions from drinking water systems
- Bioaerosol emissions from ventilation
- Bioaerosol emissions from bird depletion
- Bioaerosol emissions from dirty water generation and storage (washout)
- Bioaerosol emissions from carcass storage and disposal
- Bioaerosol emissions from dirty water/litter spreading is not applicable as this is exported
- Bioaerosol emissions from dust build up

## 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 within 400m relating to bioaerosols from the farm.

| Bioaerosol related issues                                      | Actions taken to minimise bioaerosols  | Completion date |
|--|--|-----------------|
| Effects of diet on dust and ammonia emissions (feed selection) | <ul style="list-style-type: none"> <li>• Feed composition is closely matched to the chickens' requirements</li> <li>• Feed specifications are prepared by the feed compounder's nutrition specialist. The nutritionist ensures that protein and phosphorous content is reduced as the rations change throughout the flock cycle.</li> <li>• Feed is only supplied by a UKASTA accredited feed mill, so that only approved raw materials are utilised in production.</li> <li>• A feed sample for every load of feed delivered to the site is left and documented for both quality assessment and traceability. Samples are kept on site for a minimum of 3 months.</li> <li>• Records of crude protein levels and diet formulation are kept in the site office.</li> </ul>   | On-going        |
| Feed delivery and storage                                      | <ul style="list-style-type: none"> <li>• Dry feeds are stored in silos. No liquid feed storage.</li> <li>• Diets are ad-lib fed, via sealed systems, reducing potential for dust release to the atmosphere</li> <li>• Cyclone dust catchment systems will be in place on all silos</li> <li>• Any and all spillages are cleaned up immediately. For any major spillage greater than 500kg that is unfit for animal consumption the spillage will be cleared up in to skips and removed from site for disposal via the appointed waste contractor within 24 hours of the incident. For any spillage less than 500kg, feed would be cleared up using bags and placed in the onsite general waste container for disposal.</li> <li>• Internally, the feed never falls any great distance which reduces the dust plume effect. Any leaks are repaired quickly and any spillage cleaned up</li> <li>• Open surface of troughs/feeders kept to a minimum consistent with purpose in order to minimise exposed feed surface.</li> </ul> | On-going        |

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|                                  | <ul style="list-style-type: none"> <li>• Waste feed removed and not allowed to accumulate. Feed protected from wild birds, flies and rodents.</li> <li>• The feed storage is checked by the site manager in accordance with the site's maintenance schedule.</li> </ul>   |  |
| Ventilation techniques           | <ul style="list-style-type: none"> <li>• The ventilation system is computer controlled and regularly adjusted to aid optimum internal environmental conditions.</li> <li>• The ventilation system is designed to efficiently control and, when required, remove humidity from within the buildings.</li> <li>• Maintenance schedules are in place and are carried out in line with manufacturers' recommendation and guidance. This minimises the risk of any breakdowns during the flock cycle.</li> <li>• All roof fans are inlets, which results in no deposits of dust being made on the roofs. Roof water is therefore not contaminated.</li> </ul>  |  |
| Litter conditions and management | <ul style="list-style-type: none"> <li>• Controls on feed and ventilation help maintain litter quality</li> <li>• Bedding applied internally and at low level to reduce dust creation.</li> <li>• Use of nipple drinkers with drip trays to minimise spillage</li> <li>• Use of a veterinary health plan, with specialist veterinary input used as necessary, to mitigate risks of disease outbreak leading to poorly conditioned birds and excessive dropping.</li> <li>• All walls and ceiling voids have been insulated to prevent condensation and cold bridging. Continual Damp Proof Membrane (DPM) is laid under the concrete floors to prevent moisture being drawn up from the ground.</li> <li>• Water, feed and the controlled environment are monitored and recorded by computer control to maintain dry litter conditions, which minimises ammonia and other bioaerosol levels.</li> </ul> |  |
| Carcass Disposal                 | <ul style="list-style-type: none"> <li>• Dead birds are removed from the houses on a daily basis and the numbers recorded. They are held in a freezer until the end of the cycle when they are removed by a licenced deadstock collector.</li> </ul>  |  |
| Destocking of livestock          | <ul style="list-style-type: none"> <li>• Ventilation controls to be used to control the release of bioaerosols while still maintaining optimum temperature control throughout the depletion process.</li> <li>• Machinery movements to be kept to a minimum to help avoid the churning up of damp litter</li> </ul>   |  |
| Clean out (litter removal)       | <ul style="list-style-type: none"> <li>• All internal areas are blown down using high pressure air lances to remove areas of trapped dust which, in turn, helps reduce the amount of dirty water generated.</li> </ul>  |  |

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|                            | <ul style="list-style-type: none"> <li>Litter is removed efficiently and ventilation is required throughout to ensure the environment is clear of dust and ammonia build up. Once all the litter is removed and the floors mechanically swept, the ventilation system is powered down.</li> <li>Only Defra approved disinfectants and detergents are used on site and are applied by trained personnel, in accordance with the manufacturer's guidance.</li> </ul>  |  |
| Dirty water storage        | <ul style="list-style-type: none"> <li>Areas around the houses are stone surfaced or concreted as appropriate and are kept clean at all times throughout the flock cycle.</li> <li>All dirty water is stored in underground sealed tanks, compliant with SSAFO regulations.</li> <li>Dirty water is removed from site using vacuum tankers on a routine basis, with all removals documented and in accordance with a Manure Management Plan.</li> <li>Unnecessary running of vacuum pumps avoided.</li> <li>Routinely, the storage tanks are checked before and after wash down. All rainwater is diverted to the clean water drainage routes, so dirty water storage will not be over-filled during periods of high rainfall.</li> <li>Increased bioaerosol emissions to be expected when store out-loaded, so observe wind direction if cropping/soil constraints allow. Sealed system reduces bio-aerosol creation.</li> </ul> | On-going   |
| Cleanliness of yard areas  | <ul style="list-style-type: none"> <li>Yard surfaces are properly maintained</li> <li>The drainage system works effectively to prevent ponding of water, which may release bioaerosols. This is achieved by gradient and type of yard surface, ensuring effective drainage. Inspection and maintenance in the long term will ensure that this remains the case.</li> <li>Housing, yards and equipment cleaned regularly to prevent dust build-up.</li> </ul>  | On-going as part of the inspection and maintenance programme |
| All housing and management | <ul style="list-style-type: none"> <li>Buildings are in line with BAT requirements, as will any future refurbishments be</li> <li>All housing and stock are checked for cleanliness as part of daily welfare checks</li> <li>All housing is cleaned out in accordance with written cleaning plan</li> <li>Potentially odorous spillages (e.g. feed ingredients) are cleaned up promptly</li> <li>Stocking density maintained at or below levels set out in Defra Welfare Regulations</li> </ul>   | On-going   |

|                                  |   |          |
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|                                  | <ul style="list-style-type: none"> <li>• Temperature and ventilation correspond to animals' requirements to optimise the housed environment for the birds and air quality conditions.</li> <li>• Buildings are ventilated. The fans push fresh air drawn in by the chimney through the fresh air distributor and into the house. Depending on the ventilation requirements, the barn can be supplied with fresh air, mixed air or recirculating air. This optimises the ventilation and therefore the internal environment of the building, preventing build-up of humidity and bioaerosols.</li> <li>• Build-up of waste feed in front of feeders is prevented and waste feed is removed</li> <li>• Feeders and drinkers have been designed to prevent wastage and leaks</li> <li>• Floor and wall surfaces are constructed from non-porous smooth surfaces</li> </ul>   |          |
| Biomass Boilers                  | <ul style="list-style-type: none"> <li>• N/A</li> </ul>   | N/A      |
| Spreading litter/<br>dirty water | <ul style="list-style-type: none"> <li>• Exported to a third party.</li> </ul>  | On-going |
| Dealing with<br>complaints       | <ul style="list-style-type: none"> <li>• Any bioaerosol complaints will be reported to the managers who will log and investigate causes of all bioaerosols complaints; identifying the source of the bioaerosol issue and monitoring levels at the site boundary as part of the investigation</li> <li>• The complaint details and subsequent investigation will be recorded on the site complaint form and a copy will be kept in the site office.</li> </ul>  | On-going |
| General comments                 | <ul style="list-style-type: none"> <li>• Neighbours will be informed (where necessary) prior to activities which may cause bioaerosols</li> <li>• Bioaerosol levels will be monitored on site by all staff. The source of abnormal bioaerosols will be identified and appropriate action will be taken to reduce levels back to normal</li> <li>• The effectiveness of control measures will be reviewed at least once a year or sooner in the event of any complaint or relevant changes to operations.</li> <li>• The permit operators or their delegate are responsible for checking bioaerosol emissions daily; checking for any abnormal levels or potential for increased bioaerosol production. Site tours will be undertaken daily by the operators or their representative to ensure risks of bioaerosols are assessed. Where there is potential for abnormal elevated bioaerosol emission, control measures will be put in place to mitigate the risk.</li> </ul> |          |



## Contingency Plan

| Abnormal Scenario                    | Remedial Action  | Time Limit  |
|--------------------------------------|--|---|
| Damage to building                   | Damage would be repaired asap and, depending on nature of damage, area made safe and covered/contained in the meantime to prevent increased emissions and/or destocked in the immediate area if necessary.   | <p>Depends on severity of damage and whether environment or animals are at risk.</p> <p>Immediate action required to make safe.</p> <p>Mitigation measures will continue until the damage is repaired and it is assessed as safe to revert to normal practice. This will be recorded in the inspection and maintenance records.</p> |
| Dirty water store damage or overflow | <p>Significant contingency margin across more than one store so overflow risk low.</p> <p>If risk of leak/overflow identified and a) can't be made safe immediately or b) can't be applied to land due to weather, ground conditions or other factors; then the dirty water will be removed by tanker and exported to nearest alternative store.</p> | <p>If any risk of pollution, immediate action must be taken to remove risk.</p> <p>Mitigation measures will continue until the damage is repaired/situation remedied and it is assessed as safe to revert to normal practice. This will be recorded in the inspection and maintenance records and/or incident records.</p>          |
| Pipework damage                      | <p>Stop or prevent flow of contaminated water and repair/replace damaged pipe.</p> <p>Contain any leak as far as possible.</p>   | <p>Immediately stop potential for leak.</p> <p>Replace/repair pipe asap. Time frame depends on dependency on pipe.</p>  |

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|                   | Contact the Environment Agency if there is any risk of pollution identified.  | Mitigation measures will continue until the damage is repaired and it is assessed as safe to revert to normal practice. This will be recorded in the inspection and maintenance records and/or incident records.  |
| Livestock illness | Veterinary advice and treatment plan would be referred to and additional measures taken where necessary. A decision making protocol is also in place regarding acceptable treatment windows and when to make the decision to euthanise. In the case of a notifiable disease outbreak, the site is designed for accommodating the birds as adults so the feed, water and space requirements are correct for an extended housing period if required. The nature of the muck management system means that the building can be cleaned regularly throughout the batch. We would not expect an increased daily bioaerosol output for these reasons. In the instance that it is not possible to remove muck from the site at all, alternative provision will be accommodated – either on concrete draining to a suitable containment store, or to temporary field heaps if the dry matter content is sufficiently high and the land conditions allow. A | <p>Immediate referral to veterinary/fieldsman advice for prompt treatment and management plans.</p> <p>Assess the risk for increased bioaerosol production, and adjust muck removal schedules accordingly.</p> <p>Mitigation measures will continue until the situation is under control and it is assessed as safe to revert to normal practice. This will be recorded in the animal management records and/or incident records as applicable.</p> |

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|      | <p>tanker would be deployed to increase the dirty water holding capacity on the site if necessary. Advice from the EA and APHA would be sought.</p>   |   |
| Fire | <p>Control the fire as quickly as possible.</p> <p>If the fire is not immediately possible to extinguish and is spreading, contact fire brigade immediately and remove at-risk animals if safely possible, also remove animals from nearby buildings. Unless there is sufficient, and safe, accommodation available on site at the correct stocking densities - arrange for removal of these animals from the site within 8 hours maximum.</p> <p>All firewater will be draining to the dirty water tank, so this will need frequent emptying and appropriate disposal/removal to other storage tanks/tankers. Contact Environment Agency for advice on disposal.</p> <p>Follow fire brigade advice regarding creation of fire breaks/protection and removal of flammable materials.</p> <p>Once the fire is under control and it is safe to do so, remove all burnt material within 24 hours</p> | <p>Ring fire brigade immediately</p> <p>Refer to Emergency Action Plan – Fire section</p> <p>Ring vet and haulier (see Emergency Contacts) to arrange for movement of stock, if necessary. It may be necessary to ring deadstock collector if high mortality possible.</p> <p>Mitigation measures will continue until the damage is repaired/situation remedied and it is assessed as safe to revert to normal practice. This will be recorded in the inspection and maintenance records and/or incident records.</p> |

|                     |   |  |
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|                     | and thoroughly clean and decontaminate the area.  |  |
| Ventilation failure | Ring the service engineer or electric company immediately. If the problem is a single fan, the problem should be fixed within 1 week to allow for ordering of parts if applicable. If the problem is widespread, the engineer/electrician/other should aim to have the ventilation system back to full working order within 24 hours. A diesel driven generator is available on the site should a temporary power source be required. | Ring the service engineer or electric company immediately<br>Run the back-up generator immediately if power failure is the cause.<br>Mitigation measures will continue until the damage is repaired/situation remedied and it is assessed as safe to revert to normal practice. This will be recorded in the inspection and maintenance records and/or incident records. |
| Diet problems       | In the case of a diet issue (e.g. where feed quality was below standard or feed type was incorrect), we have the capacity to remove and replace feed in the bins.<br><br>Diets are continually reviewed by a professional nutritionist and feedback on feed quality and requirements given via Noble Foods Ltd and veterinary practice.<br><br>N.B. Diets are only sourced from UFAS accredited mills.                                | Contact feed supplier (and vet if applicable).<br><br>Mitigation measures will continue until the situation is remedied. This will be recorded in the inspection and maintenance records and/or incident records.  |

|                                       |   |   |
|---------------------------------------|---|---|
| <p>Failure of containment of food</p> | <p>In the case that a feed pipe leaks within the buildings, the system should be stopped and leaked feed cleared up promptly. No potential for contamination of clean water system.</p> <p>In the case that the feed bin leaks or the blow pipe fails and feed is spilled on to an outdoor area, the surface water drainage point should be immediately protected to prevent contamination of clean water systems. Any and all spillages should be cleaned up immediately. For uncontaminated feed fit for animal consumption, it can be blown in to another silo by the feed company vehicle (dependent on biosecurity risk). For any major spillage greater than 500kg that is unfit for animal consumption the spillage will be cleared up in to skips and removed from site for disposal via the appointed waste contractor within 24 hours of the incident. For any spillage less than 500kg, feed would be cleared up using bags and placed in the onsite general waste container for disposal.</p> | <p>Stop the potential for leaks immediately.</p> <p>Protect clean water inlet immediately by shutting it off or containing the spillage area through use of e.g. straw/sandbags. Protect from rainfall and pests if it is not possible to remove the spilled feed, or feed from a damaged bin, within a few hours. The affected area/feedbin should be free of feed within 24 hours.</p> <p>Mitigation measures will continue until the damage is repaired/situation remedied and it is assessed as safe to revert to normal practice. This will be recorded in the inspection and maintenance records and/or incident records.</p> |
|---------------------------------------|---|---|

|  |  |  |
|--|--|--|
| <p>Carcass disposal route failure</p>                                      | <p>In the case of increased mortality or/and culling of large numbers, the deadstock collector must be able to collect all deadstock immediately or within short timescale. Where immediate collection is not possible, all carcasses must be stored in sealed, locked containers capable of retaining all effluents and of reducing risk of bioaerosol release.</p> <p>In the case of normal contracted deadstock collector being unable to collect the carcasses within the required timeframe, there are multiple other collectors used within the wider supply chain which can be called on.</p> | <p>Immediate communication with deadstock collector(s).</p> <p>Mitigation measures will continue until the situation is concluded/remedied and it is assessed as safe to revert to normal practice. This will be recorded in the animal management records and/or incident records as appropriate.</p> |
| <p>Temporary storage and disposal of any wastes arising from incidents</p> | <p>Used sand, straw bales, and other waste materials arising from containing pollutants should be stored on an impermeable surface protected from drainage routes.</p>   | <p>Where applicable, the waste contractor (see emergency contacts) should be contacted within 24 hours of an incident and arrangements made for safe disposal.</p> <p>Mitigation measures will continue until the situation is remedied. This will be recorded in the incident records.</p>            |

To ensure remedial action has been completed successfully, the operators are responsible for inspecting the situation or equipment/infrastructure and assessing whether it is made safe and can operate in compliance with the permit and other regulatory requirements. Inspection and monitoring schedules may be revised to monitor the specific situation more frequently/closely thereafter, as appropriate.

### **Summary**

Bioaerosols are assessed daily by operators. Air quality within the buildings is also assessed (automatic and sensory assessment). Weather monitoring/forecasting, also help to assess the risks and take additional actions to mitigate them if necessary.

We have always worked hard to minimise our impact on our closest receptors. We continually assess management techniques to improve our control of bioaerosols and emissions.

In accordance with H4 Bioaerosol Management guidance, we will review the effectiveness of our control measures at least once a year and in the light of any building and management changes and on the outcome of investigations into the causes of any future complaints, if any occur.

Any complaints will be recorded and investigated using the guidance from EPR 6.09 3.1 and 3.2 odour and emissions management on intensive livestock installations.

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