

AMMONIA IMPACT ASSESSMENT

Methwold Airfield Poultry Unit

Methwold Airfield
off Brandon Road
Methwold
Thetford
Norfolk
IP26 4RJ

Environmental Permit No.	EPR/ UP3209PN
Grid Reference	572069 293500

BACKGROUND

The installation is currently permitted by the EA to grow 300,000 broiler chickens in 6 poultry houses using a standard ventilation method consisting of high velocity roof ridge fans (>11m/s efflux and >5.5m above ground level) and gable end fans for back-up in hot weather.

The proposal is to grow 80,000 broiler-breeder (layer) chickens instead of the 300,000 broiler chickens in the same 6 poultry houses.

IMPACT ASSESSMENT

1. EA Pre-Screening

- Initial pre-application screening was carried out by the EA pre-application service.
- This screening identified that: -
- That ammonia deposition (nutrient nitrogen or acid) is predicted to be in excess of 20% (Z%) of the relevant critical load (nutrient nitrogen or acid) at Breckland SPA (see table below)
- That there is the potential for an in-combination effect with existing farms at Breckland SAC and Breckland Forest SSSI. Ammonia emissions are predicted to be > 4% (Y%) of the critical level at Breckland SAC and ammonia deposition (nutrient nitrogen or acid) is predicted to be > 20% (Y%) of the critical load (nutrient nitrogen or acid) at Breckland Forest SSSI (see table below)

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EA Pre-Application Screening Results –Tables2/3/4

Assessment of nutrient nitrogen deposition						
Site Name	Designation / Status	Nutrient Nitrogen Critical Load (kg N/ha/yr)	Process Contribution (PC) (kg N/ha/yr)	PC as % Critical Load	Y %	Z %
Breckland	SPA	5	1.164	23.3	4	20
Assessment of ammonia emissions						
Site Name	Designation / Status	Ammonia Critical Level (µg/m3)	Process contribution (PC) (µg/m3)	PC as % Critical Level	Y %	Z %
Breckland	SAC	1	0.053	5.3	4	20
Assessment of nutrient nitrogen deposition						
Site Name	Designation / Status	Nutrient Nitrogen Critical Load (kg N/ha/yr)	Process Contribution (PC) (kg N/ha/yr)	PC as % Critical Load	Y %	Z %
Breckland Forest	SSSI	5	1.164	23.3	20	50

- The pre-screening indicates that ammonia emissions (nitrogen deposition) from the site are likely to have a significant direct and/or “in-combination” impact on nearby designated habitat sites (as above) if unabated.

2. Specialist Ammonia Modelling

- Additional preliminary screening was initially carried out by specialist environmental consultants, AS Modelling & Data Ltd, to check and confirm the initial pre-screening outcomes reported from EA.
- Screening was undertaken for both 90,000 and 80,000 broiler-breeder chickens, based on the livestock being housed in the same manner as broiler chickens with a standard ventilation method consisting of high velocity roof ridge fans (>11m/s efflux and >5.5m above ground level) and gable end fans for back-up in hot weather.
- This screening corroborated the findings of the EA pre-application screening, confirming the likelihood of a significant environmental direct and/or “in-combination” impact on nearby designated habitat sites with 80,000 or more broiler-breeders housed using an unabated ventilation system.
- Methods of mitigation were therefore investigated, in conjunction with specialist poultry ventilation providers.
- Ammonia emissions reduction through the use of wet acid air scrubbing was identified as a suitable abatement application for the proposed housing with equipment and built and supplied by the specialist company IPT Technology Ltd. For this application the ventilation system is modified to a continuous system with air drawn through side vents and extracted via wet acid air scrubber units located at the gable end of each house.
- Detailed modelling was carried out by AS Modelling & Data Ltd to assess the impacts from 80,000 broiler-breeder (layer) chickens housed with the revised continuous ventilation system using IPT air scrubber mitigation.
- Full details for the modelling of the mitigated proposals are included in document reference **MA 014 Ammonia Modelling Report** and **MA 014.1 Ammonia Modelling Data Files**.

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- The modelling work considered various scenarios including operating with unabated emissions from one or two of the six poultry houses as well as full abatement and no abatement.

3. **Mitigation Method**

- The mitigation of ammonia emissions is achieved through the application of wet acid air scrubbing technology to all 6 poultry houses.
- The wet acid air scrubber ventilation units are designed to provide all the ventilation needs of the fully stocked houses across the normal range of operating conditions. Each air scrubber unit is equipped with 6 high-velocity fans mounted into individual chimneys stacks that are 6.5m above ground level. Air is drawn into the houses via inlets located along the sides of the building. It is then drawn into the air scrubber units through a single large internal inlet where it passes through a filter system before being expelled through the chimney stacks. Roof ridge mounted high-velocity fans and gable end fans provide emergency back-up to the continuous ventilation system.
- Continuous recording via an electronic logbook is in place and that can be accessed remotely and locally.
- Wet acid scrubbers are identified as an appropriate BAT for reducing ammonia emissions to air from broiler breeder houses (Commission Implementing Decision (EU) 2017/302 – **BAT 31 c.1**)
- A detailed control plan for the wet acid air scrubbing system (Document **MA 014.3 Ammonia Emissions Control Plan**) has been developed to ensure the effective ongoing control, operation and maintenance of the system.

4. **Summary of Assessment**

- Even with one of the houses being fully unabated (i.e. the continuous loss of one of the air scrubbers for a full year – Pessimistic Results / Scenario 3 in the report) the process contribution to the annual ammonia concentration and the nitrogen and acid deposition rates for at all SSSIs, SPAs and SACs considered, would be below the Environment Agency’s lower threshold percentages of Critical Level or Critical Load (20% for a SSSI and 4% for a SPA/SAC).
- With the implementation of the proposed mitigation technique and the related control plan, it is assessed that there is no significant risk of ammonia emissions from the proposals adversely impacting onto nearby habitat sites. (see also MA 004 Environmental Risk Assessment).
- The fully abated proposal for 80,000 broiler breeders delivers an improved outcome in relation NH3 emissions in comparison to the existing permitted activity for 300,000 broilers with standard ventilation.

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