

Pollution Prevention and Control (Industrial Emissions) Northern Ireland

**Guidance for Operators on producing an Air Dispersion
Modelling Report for a PPC Farming Application.**

**Version 2
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Record of changes

Version	Date	Change
1	September 2015	Initial version
2	September 2017	Updated to reflect change to Department of Agriculture, Environment and Rural Affairs (DAERA)

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1. Introduction:

To determine applications for permits under the Pollution Prevention and Control (Industrial Emissions) Regulations (NI) 2013 information is needed on the potential environmental impacts of the installation being considered. Often the only way in which the exposure of a sensitive receptor such as a third party dwelling or habitat to a pollutant can be assessed, is through the use of air dispersion modelling.

This document provides guidance on the approach to be applied for assessing the exposure of receptors such as designated sites to ammonia from intensive livestock farms. It is important that dispersion models are set up correctly to represent the situation being considered and therefore it will generally be necessary to employ experienced consultants to undertake this work. This guidance is aimed primarily at these consultants and gives details on the choice of model, use of meteorological data and the information to be included in modelling study reports.

An Air Dispersion Modelling Report should contain all the information required to allow the regulator to make an informed assessment of both the suitability of the modelling and impacts of the proposed development. It should also be written in a manner which allows interested members of the public to judge the impacts of the proposals.

Contents of all Air Quality Assessment Reports.	
Introduction	The introduction should provide details of the proposed installation (number of houses, type and number of animals etc), its location and the reasons for the modelling.
	Details of the modelling software to be used.
	Details of the criteria to be modelled and the corresponding thresholds/guideline values – In the case of a basic farming application the criteria will normally be odour, PM10 and ammonia. However, where there is a CHP etc NOx etc may be required.
	Details of the source of input data. For example, the performance of equipment will often be supplied by the operator or equipment installer, emission figures may come from reference material, the size, location and capacity of buildings will be supplied by the operator etc.
Model Inputs	
Houses/animals	A list of the houses on site and the animal number/type in each house.
Ventilation	<p>Ventilation type (natural, capped fans, side fans, open fans).</p> <p>Fan volumetric rate, speed and height.</p> <p>Efflux temperature.</p> <p>Roof fans should be modelled as point sources with an appropriate velocity (m/s) or Volume Flux (m³/s). If the chimney is capped a velocity of zero should be used.</p> <p>Gable or side mounted fans should be modelled as point sources with a velocity of zero.</p> <p>Naturally ventilated buildings should be modelled as volume sources.</p> <p>Slurry lagoons and open tanks should be modelled as area sources.</p>
Emissions	<p>Ammonia, PM10, Odour for most farms.</p> <p>NOx etc. for CHP.</p>
Baseline data	Details of the source of background data. The source of background data should be in a similar location to that of the farm.
Met. Data	<p>State the source of Met. Data and the years used.</p> <p>Five consecutive years should be used. These should be the most recent years available.</p>
Terrain	Provide justification for the inclusion or not of terrain treatment and report the source, format and processing of digital terrain data in the model.
Sensitive Receptors	
Third party dwellings	Location of each of the third party dwellings. This should be a location on the third party dwelling property which is closest to the farm. This is usual located in the garden of the property. Where there is a particularly large garden some judgement may be required as to the closest part of the garden in normal use. Normally only the closest dwellings in each direction need be modelled

Habitats	The report should always state the location of the nearest designated sites and habitats (ASSIs, SACs, SLNCIs – Sites of Local Nature Conservation Importance) even if these are not close by. The impacts on any designated site with sensitive habitat within 7.5km of the farm should be modelled. The location for modelling of the habitat should be a point closest to the farm unless justification can be given for another point (e.g. there is no ammonia sensitive vegetation at the closest point).
In-combination impacts	If detailed air dispersion modelling is carried out and shows Process Contribution (PC) < 1% then it is considered insignificant and can be screened out and an in-combination impact would not be required. Where the PC > 1% then the PC should be combined with that for any other plans or projects currently proposed or operational since 2011. Calculate the sum of all the included PC impacts at each of their closest points at the relevant habitat. PC < 1% do not need to be included.
Surface roughness	The surface roughness used in the model should be stated.
Air quality objectives	The relevant air quality objectives for the protection of human health and the critical levels for the relevant habitats should be stated.
Farm buildings and emission points	
Buildings	The location (building centre or SW corner depending on software), height, length, width and angle to north should be stated for each building on the farm.
Emission points	The location of each emission point should be listed.
Results	
Odour	The results table should state the 98 th Percentile 1 hour figure at each of the third party dwellings for each of the 5 years modelled.
Dust (PM10)	The results table should state the 90.4 th percentile and the annual average figures at each of the third party dwellings for each of the 5 years modelled.
Ammonia	The results table should state the maximum and the annual average ammonia at each of the sensitive receptors for each of the 5 years modelled.
Nitrogen Dioxide (if appropriate)	The results table should state the 99.8 th percentile 1 hour and the annual average figures at each of the third party dwellings for each of the 5 years modelled.
Site location map	A map should show the location of the farm buildings and the third party dwellings used in the modelling.
Input files in electronic format	An electronic copy of the input files for the model should be supplied in the form of a compact disc.

Checklist

Item	✓/✗	Reason for Omission
Site Location map		
List of pollutants modelled and relevant air quality guidelines.		
Details of modelled scenarios		
Relevant background data		
Emission figures		
Details of receptors		
Met. Data used		
Details of terrain treatment		
Details of buildings and ventilation treatment.		
Assessment of impacts		
Model input files in electronic format.		