

Assessing Environmental Impacts of Poultry and Pig Farms

Supplementary Guidance for IPPC Applications

Northern Ireland Environment Agency

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1. INTRODUCTION

1.1 Why do I need to assess the environmental impacts

The Pollution Prevention and Control (Northern Ireland) Regulations 2003 require you to provide an assessment of the environmental impacts of the emissions from your farm. Questions in Section B4 of the application form ask for 'an assessment of the potential significant environmental effects of the foreseeable emissions from your installation'. A proper assessment of the environmental impacts is necessary so you can demonstrate that no significant pollution is caused by the installation and the related activities. The impacts to be assessed are those that may be harmful to human health or the quality of the environment, or cause offence to human senses.

1.2 Aim and scope of this guidance

Assessing environmental impacts can be a specialised task requiring the input of a number of scientific disciplines. The aim of this guidance is to provide farmers with the information to allow them to make a basic assessment of the environmental impacts without recourse to specialist help. This guidance follows the format set out in the guidance "Application for a Permit - Examples of Supporting Documentation"¹ and aims to provide additional advice on the methods used, based on information you provide about your farm.

The scope of this guidance is to provide an initial screening tool that will provide a basic assessment of environmental impacts. Based on farm size and their proximity to sensitive receptors, it will allow you to provide an assessment of impacts from the installation and identify whether further detailed investigation is or is not necessary. It is important to recognise that it is not a substitute for more detailed investigation in cases where farms are located close to sensitive receptors, or a significant impact is predicted from the result of this screening.

Sensitive receptors are primarily people in dwellings, hospitals, schools and similar premises, but can include people frequenting open spaces, for example, parkland. The person in control of the installation would not normally be considered to be a sensitive receptor. You are required to submit an odour or noise management plan as part of your application where your farm meets the following criteria:

- there are sensitive receptors within 400m of the farm; or
- the farm has been the cause of odour or noise complaints.

Sensitive receptors also include Areas of Special Scientific Interest (ASSIs) and European Sites, Special Areas of Conservation (SACs) and Special Protected Areas (SPAs), as defined under The Conservation (Natural Habitats etc.) Regulations Northern Ireland 1995. Further assessment such as air dispersion modelling may be required if your installation is within 2km of such sites.

¹ Pollution Prevention and Control (Northern Ireland) Regulations 2003. Application for a Permit - Examples of Supporting Documentation (May 2006). Prepared for the NIEA.

1.3 What will more detailed investigation involve?

For new and expanding installations, we will expect you (the applicant) to provide any further assessment that may be required.

For existing installations making applications between 1st November 2006 to 31st Jan. 2007 the Northern Ireland Environment Agency (NIEA) will carry out a screening exercise to make an initial assessment of the potential environmental impacts from your farm based on the information you provide in your application in accordance with this guidance e.g. from ammonia, dust and odour. Where a potentially significant impact on sensitive receptors is predicted from this screening, NIEA may require you to carry out atmospheric dispersion modelling and it may be necessary to include conditions within your permit to monitor/control emissions from your installation. However, odour or noise management plans if required, should be submitted by you, with applications for existing installations.

In cases where more detailed investigation is required, emission data and weather data suitable for your location will be measured or estimated, and used in a mathematical atmospheric dispersion model such as ADMS or AERMOD. The model will calculate the predicted spread of the emission, usually ammonia, odours, or small dust particles around the source. Most models will draw a contour plot around the source. The plot shows the ground level concentrations of the pollutants emitted and these concentrations can be compared with benchmark levels or standards. Atmospheric dispersion modelling services are available commercially and NIEA can provide advice on the parameters to include.

NIEA will then consider the significance of the impact, as predicted by the model, on a case by case basis.

2. BASIC STAGES OF ENVIRONMENTAL ASSESSMENT

The tables on the following pages have been prepared to help you assess the impacts of your farm on the environment. Some typical examples are set out in Table 1. You should consider carefully your own situation and include any of these that are applicable to your business and complete a similar Table adding in any additional impacts relevant to your farm. Follow the steps below to complete the information required in each column.

2.1.1 Step 1: Identify the sources of emissions and activities that impact on the environment

In the first column, identify the activities you undertake on your farm that may have an impact on environment. These include livestock housing, storage of fuel and chemicals, storage of manure or contaminated water/slurry, clean out of livestock housing, disposal of carcasses, manure spreading.

2.1.2 Step 2: Identify the emission

Identify what the emission is. The main emissions from livestock are ammonia, odours, dust, discharges of contaminated water and noise. These should be entered in the second column.

2.1.3 Step 3: Identify the receptors

In the third column, you should identify which receptor could be or is affected by the emission. There may be more than one receptor affected by some emissions. For example, dust emitted from livestock housing can impact upon air, plants, animals and humans, but it is also deposited to land, and may enter water courses through run-off. You need to think about how the emission reaches the receptors from its source (the pathway) and the distance travelled. For example, noise and odour can affect people close to the farm e.g. within 400m; ammonia may affect plants, animals and humans at greater distances, perhaps up to 2km. Your site location plan and your site drainage plan (prepared for your application) can be used to help you identify sensitive receptors.

2.1.4 Step 4: Describe the negative impact and duration

In the fourth column you should identify the nature of the negative impact. For example, dust can cause a nuisance to people and can reduce air quality that may impact on health through inhalation of particles. Dust can also impact upon plants by covering the leaves, which will last until the next rain shower. Decide whether the duration of the impact is short, medium or long term. Some impacts may last for only a few hours (short-term), for example, the noise from restocking livestock, whereas other impacts may last for a long time or be constant (long-term), for example, ventilation fans in summer or emissions of ammonia. Other impacts will have a duration somewhere in between and should be considered medium term.

2.1.5 Step 5: Identify the significance of the impacts

In the fifth column you should identify the significance of the emission, at the same time considering the mitigating measures you have implemented. For example, the impact of any nutrient (fertilising) effects of ammonia on arable land may be of negligible significance (nil). The same fertilising effect of ammonia on semi-natural woodland or raised bog would be highly significant (major). In general, toxic impacts are of major significance whether they are short, medium or long term and regardless of the receptor; long term impacts are often of major significance; and short term impacts are often of minor significance.

2.1.6 Step 6: Identify the mitigation or management measures that you will have in place to reduce the impacts

There may be measures that you have taken to minimise the negative environmental impacts such as management techniques, careful siting of housing, tree planting, notifying neighbours of activities. Other measures will have been identified in your application, e.g. manure drying techniques, covering slurry stores, treating run-off. Include these in the final column of your table.

3. EXAMPLE TEMPLATE FOR ASSESSING ENVIRONMENTAL IMPACTS

Table 1 Examples that can be amended for your own farm circumstances:

Source of Impact	Impact e.g. odour, noise, dust, ammonia, run-off, spillage	Receptor Air, water, land Humans, plants	Description of Negative Impact Nature of impact i.e. short term ST, medium MT or long term LT	Examples of significance of negative impacts: major +++ moderate ++ minor + nil 0	Mitigation / Management Measures e.g. site planning, technical measures
Livestock housing	Ammonia	Air Land Plants	Possible direct toxic effect on trees ST Increased acidification of soil close to housing MT Changes to sensitive ecosystems LT	++ + ++	<ul style="list-style-type: none"> • Dry litter/manure maintained • Frequent removal of slurry to covered store • Reduced slatted area in housing • Provision of clean straw for bedding • Balanced rations formulated • No sensitive woodland or other ecological receptors close to housing • Appropriate soil pH maintained by liming
	Odour	Humans	Nuisance ST	+++	<ul style="list-style-type: none"> • Dry litter/manure maintained • Hard standing areas/pens kept clean and spillages prevented • Slurry/manure stores covered • Emissions discharged via high velocity roof vents • Dirty water collection systems are enclosed • No spillage from feed and drinking systems/stores • Drains and treatment systems well maintained
	Dust	Humans Plants Land Water Air	Nuisance ST Contributes to odours ST Health issues - inhalation LT Covers leaves stopping photosynthesis ST Nutrient enrichment of water courses MT Impacts on air quality ST	+ ++ + + ++ +	<ul style="list-style-type: none"> • Emissions discharged via high velocity roof vents • Regular clearing of dust to prevent build up on surfaces and around vents • No sensitive vegetation around sheds • Dwelling houses far enough away not to be affected • Production of dust minimised at source • Fan cowls fitted where appropriate • Hard standing cleaned to prevent dust being washed into water courses • Run-off treated by swale

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	Noise	Humans	Nuisance ST	+	<ul style="list-style-type: none"> No feed delivery at night, vehicles well silenced Doors in housing sited away from neighbours Careful handling during stocking and de-stocking Fans and machinery well maintained Need for yard scraping minimised Conveyors/augers not run empty Voices not raised unnecessarily Use of external alarms avoided
	Used disinfectants	Water	Possible toxic effects on wildlife ST Increased biochemical oxygen demand (BOD) of watercourses ST	++ +	<ul style="list-style-type: none"> Spent disinfectant disposed of into dirty water tanks Use of Defra/NOAH approved disinfectants Disposal of tank contents in accordance with DARD water code
Disposal of carcasses	Odour	Humans	Nuisance ST	+	<ul style="list-style-type: none"> Good husbandry to minimise mortalities Use of covered/sealed skips to store carcasses Carcasses disposed of weekly
	Disease	Humans	Health risks ST	0	<ul style="list-style-type: none"> Use of covered/sealed containers No contact with people
		Livestock	Biosecurity issues ST	+	<ul style="list-style-type: none"> Use of covered containers Carcasses disposed of daily Bait traps used for rodent control
	Incinerator stack emissions (if used)	Air	Odour nuisance ST Emission of acid gases contributing to acid deposition LT	+ +	<ul style="list-style-type: none"> Incinerator fully complies with requirements of Animal By-Products Regulations Performance is monitored
Cleaning out - litter/manure/slurry	Contaminated run-off	Air Land Water	Increase in nitrogen and phosphorus levels in soil MT Potential for increased mineral or metal content of soils LT Increased biochemical oxygen demand (BOD) of watercourses ST Nutrient leaching from soil to surface waters and groundwater LT Nutrient enrichment (eutrophication) of watercourses and ground water LT	+ + ++ +++ +++	<ul style="list-style-type: none"> All run-off diverted to waste water tanks Hard standing has kerbing Waste water disposed of in line with DARD Water Code Dirty water tanks are emptied prior to clean out All lightly contaminated run-off treated by swales when not cleaning out
	Noise	Humans	Nuisance ST	+	<ul style="list-style-type: none"> Machinery operated at reasonable times, wherever possible Equipment maintained to optimum standards Need for scraping minimised due to reduced yard area Machinery and equipment sited as far as

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					<ul style="list-style-type: none"> possible from neighbours Voices not raised unnecessarily Roads and tracks maintained to minimise noise produced
	Odour	Humans	Nuisance ST	+++	<ul style="list-style-type: none"> Loads covered Load trailers close to the shed door or inside Outdoor heaps avoided if possible Yard areas cleaned at the end of each day Dirty water collection systems covered Dirty water tanks emptied promptly Bank holidays avoided and where possible when wind blowing onto dwelling houses
Litter / manure /slurry spreading	Ammonia and major nutrients (N:P:K)	Air Land Plants	Contributes to climate change LT Contributes to odours ST Nutrient enrichment or 'fertilising' effect on crops, plants and water. LT Changes to sensitive ecosystems such as natural woodland, heathland or peatland. LT Nutrient enrichment of soils, particularly phosphorus LT Potential for increased mineral and metal content of soils LT Eutrophication caused by run-off LT Reduced biodiversity LT	+ +++ ++ + +++ ++ + ++ +	<ul style="list-style-type: none"> Litter/manure/slurry applied in accordance with manure management plan Balanced diets fed to reduce N & P in manure Litter/manure/slurry incorporated within 24 hours Application in accordance with DARD codes of good practice Only temporary field heaps used No ecologically sensitive receptors near the site On clean out all litter/manure removed from site Low trajectory slurry application techniques used
	Odours	Humans	Nuisance ST	+++	<ul style="list-style-type: none"> Litter/manure/slurry applied in accordance with manure management plan No spreading in adverse weather conditions No spreading at weekends or on Bank Holidays No spreading close to neighbours' houses Litter/manure/slurry incorporated within 24 hours Low trajectory slurry application techniques used
Feed milling and mixing	Dust	Humans Air Water Land Plants	Nuisance ST Contributes to odours ST Health issues - inhalation LT Covers leaves stopping photosynthesis ST Nutrient enrichment of water courses MT Impacts on air quality ST	++ ++ + + + +	<ul style="list-style-type: none"> Ensure process is sealed and/or dust abatement equipment is installed High standard of cleanliness maintained
	Noise	Humans	Nuisance ST	+	<ul style="list-style-type: none"> Machinery operated at reasonable times, wherever possible

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					<ul style="list-style-type: none"> • Fans and machinery well maintained • Vehicles blowing feed properly silenced and not operated at night • Conveyors/augers/mills not run empty • Use of external alarms avoided • Noisy machinery contained within sheds and locate away from neighbours
	Leakage/spillage	Land Water	Contamination of surface and groundwaters ST Increased BOD in water courses ST	+ ++	<ul style="list-style-type: none"> • All feed storage tanks maintained in good condition • Pipework and valves well maintained and fail safe • Liquid feed containers structurally sound • Underground pipework maintained and tested • Any spillage cleaned up immediately
Storage of fuel, chemicals etc.	Leakage	Water	Contamination of surface and groundwaters ST Killing of animals, plants and aquatic life ST	+ +++	<ul style="list-style-type: none"> • All tanks are bunded and compliant with legislation • Use of chemicals that are least hazardous to the environment • Spill kits available • Care taken during filling of fuel tanks