

# **Pollution Prevention and Control (Scotland) Regulations 2012 (PPC)**

## **Intensive Livestock Installations**

## **Standard Farming Installation Rules (How to Comply)**

## **Incorporating PPC Permit application guidance**

**This document is issued by the Scottish Environment Protection Agency (SEPA) and provides guidance for intensive pig and poultry farmers. This document is applicable for use in Scotland only. Equivalent documents are available for use in other parts of the UK.**

**APRIL 2013**

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# 1 INTRODUCTION

The Industrial Emissions Directive (IED) Directive is intended to place controls on the environmental impacts from a list of specified activities. Its aim is to ensure the application of Best Available Techniques (BAT) to prevent, or reduce, emissions to air, land and the water environment from these activities and to ensure that resources are used efficiently. In Scotland the IED Directive is implemented through the Pollution Prevention and Control (Scotland) Regulations 2012 (The PPC Regulations).

These PPC Regulations apply to larger pig and poultry farms with “places” for more than 40,000 poultry<sup>1</sup>, 2,000 production pigs over 30kg or 750 sows. Farms with livestock places exceeding these thresholds are required to obtain a PPC permit from the Scottish Environment Protection Agency (SEPA) prior to going into production.

## Purpose of this Document

The PPC Regulations require that all installations will be operated using the Best Available Techniques (BAT) for preventing or, where that is not practical, reducing emissions and reducing the impact of the operation on the environment as a whole. The Best Available Techniques are set out in BAT Conclusions which are contained in the relevant BAT Reference Document (BREF). BAT conclusions will be the reference for setting permit conditions, Definitions of BAT, BAT Reference Document and BAT conclusions are given in Regulation 4 of the PPC Regulations. When applying for a Permit farmers will be expected to demonstrate that they are meeting BAT.

This document reflects SEPA’s view of BAT for a number of issues relating to intensive agricultural operations and should be used as a guide with which to benchmark your own farming activities. N.B SEPA will expect BAT to be applied to all areas of your operation including plant, facilities, management practices, structures and husbandry techniques at the farm.

The document breaks down activities on the farm into discrete areas of operation. For each area there are a number of “rules” (in shaded boxes). The intention is that these rules will be placed in your permit as conditions with which you must comply. Under each set of rules guidance is given on how these rules/conditions can be complied with.

Within your application you will be asked to confirm whether you can comply with the rules, if you are not able to comply, SEPA needs to know. There is an expectation that new and expanded farms must use these techniques or techniques which give equivalent levels of environmental protection from the date of first operation and should require few or no improvements at the time of application. However if this is not possible you may be able to obtain SEPA’s agreement to upgrade over time to meet a requirement. The time allowed may vary depending on site specific circumstances and the perceived risk to the environment. The application is your opportunity to put your proposals to SEPA. Where no proposal is contained within your application, SEPA may impose a specific requirement and time limit upon you without your input.

Within your application you will be given an opportunity to explain to SEPA the techniques you propose to use and put your argument as to why it is the best available to you to achieve that goal. Further discussion of the concept of Best Available Techniques (BAT) can be found in Regulation 4 and Schedule 3 to the PPC Regulations and within “Pollution Prevention and Control - a practical guide for Part A activities” which is available from SEPA’s website.

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<sup>1</sup> Poultry has the same meaning as in point 1 of Article 2 of Council Directive 2009.158/EC ‘Poultry means fowl, turkeys, guinea fowl, ducks, geese, quails, pigeons, pheasants, partridges and ratites reared or kept in captivity for breeding, the production of meat or eggs for consumption, or for re-stocking supplies of game.

Much of this guidance is based on the BAT Reference Document (BREF) for Intensive Livestock Installations produced by the European IPPC Bureau. You can refer to this BREF for more detailed information on BAT at the European level.

## **The Permit**

To obtain a PPC Permit, you need to submit an application and correct fee (to cover the costs of assessment) to SEPA using the SEPA application form.

SEPA will actively consult with a number of bodies before issuing a Permit e.g. Local Authorities, Health Boards, Scottish Natural Heritage and the Food Standards Agency. The PPC Regulations also require you to inform the general public that an application has been submitted, through notices in the Edinburgh Gazette and a local newspaper. All applications, Permits and details of SEPA's decisions will be publicly available documents.

SEPA will assess the application and establish the level of compliance with the BAT conclusions either on application or with improvements and to ensure that your activities will not cause significant pollution. SEPA expects to issue a permit in most cases, however, your application may be refused if you are causing significant pollution and steps are not taken to address this.

The Standard Farming Installation Rules and other conditions within the permit apply once the permit is granted, and an annual subsistence fee (pro rata) is due from the issue date (paid annually). SEPA will assess compliance with the permit. Officers will periodically review audits and plans, investigate any complaints, carry out site inspections and agree improvement programmes. Where a Permit is not being complied with SEPA will consider action under its enforcement policy. Operating a PPC installation without a valid permit or failing to comply with a condition of a permit is a criminal offence.

It should be noted that where an aspect of the installation is not covered directly by a condition of the Permit Regulation 17(1) & (2) of the Regulations applies. Regulation 17 specifies that it is a condition of a Schedule 1 permit that the operator must use the best available techniques for preventing or, where that is not practicable, reducing emissions from the installation. Where this condition applies operators will need to ensure that they are using BAT to ensure compliance with their Permit.

## 2 STANDARD FARMING INSTALLATION RULES

### 2.1 General Management

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|-------|---|
| 2.1.1 | The operator shall have an appropriate person (and deputy) as the primary point of contact with SEPA and shall notify SEPA in writing of the name of the appointed person (and deputy) within 4 weeks of the date of this permit.   |
| 2.1.2 | In the event of a different person being appointed to act as primary point of contact (or deputy) the operator shall notify SEPA in writing of the name of the appointed person or deputy without delay.  |
| 2.1.3 | A copy of this permit shall be kept at the permitted installation and shall be made readily accessible for examination by all staff.  |
| 2.1.4 | The operator shall ensure that all staff engaged in carrying on the permitted activities are fully conversant with those aspects of the permit conditions which are relevant to their duties.   |
| 2.1.5 | The permitted activities shall be managed and operated:<br><br>(a) in accordance with a management system, which identifies and minimises risks of pollution, including those arising from operations, maintenance, incidents and non-conformances and those drawn to the attention of the Operator as a results of complaints; and<br><br>(b) by staff who are competent in respect of the responsibilities to be undertaken by them in connection with the operation of the activities. |
| 2.1.6 | Records demonstrating compliance with Condition 2.1.5 shall be maintained by the Operator.  |

### MEETING THESE RULES AND ADVICE ON 'BAT'

#### Point of contact

You will need to identify an appropriate person and deputy (in case of absence of the appropriate person) who SEPA can contact. If you change the appropriate person or deputy point of contact for SEPA you will need to tell SEPA in writing.

#### Management systems

You should produce, maintain and employ an environmental management system for your farm. This system should identify pollution risks and put in place methodologies for preventing, or where that is not possible, minimising pollution.

"Operations"- The reference to operations in the condition means that you must consider how to minimise the environmental risks and impact of the normal running of the activities.

"Maintenance" - Poor maintenance is a common cause of environmental incidents. You should carry out a programme of inspection and planned preventative maintenance rather than waiting for failures before taking action. Your maintenance programme should include feed stores, manure, slurry and dirty water containment as well as facilities for storing chemicals, veterinary medicines, waste products and agricultural fuel oil. You should ensure that plant such as slurry pumps, mixers, separators and ventilation systems operate correctly.

The management system should outline the inspection regime detailing when all structures and plant should be inspected. The inspection frequency should be appropriate to the pollution risk associated with the structure and should reflect manufacturer's guidance where available. However as an absolute minimum all relevant structures should be inspected on annual basis. These inspections should:

- be carried out by people with appropriate expertise;

- look for signs of leakage, corrosion and structural damage, security and correct operation;
  - include a visual appraisal of the structure or facility;
  - take opportunities to inspect structures when they are empty or partially empty; and
  - be recorded together with any corrective action undertaken as a result of the inspection.
- These should be available to SEPA on request.

**Safety note: Enclosed structures or tanks may contain lethal or explosive gases. Do not enter them without seeking advice from the Health and Safety Executive.**

"incidents", "non-conformances" and "complaints" – The management system should be designed to prevent incidents<sup>2</sup>, non-conformances (with your permit or your management system) or complaint and should be reviewed and revised if any of the above should occur. A review of systems employed should also take place following a 'near miss'.

You should also have systems in place to deal with complaints and to take appropriate measures to prevent, or where that is not possible, to minimise the causes of complaints.

### **Competence**

All staff<sup>3</sup> should have clearly defined roles and responsibilities, with instructions covering what they should (and should not) do. SEPA will use these instructions when investigating incidents caused by human errors or omissions. Responsibilities should be written for a post holder rather than for an individual. Staff should have received appropriate training to ensure that the activities they undertake are operated to comply with the permit requirements. Appropriate training should include:

- incident prevention and the actions to be taken should such an incident occur;
- awareness of the 'environmental management system';
- awareness of the permit conditions and how compliance can be secured;
- awareness of potential environmental effects under routine and abnormal conditions;
- instruction in the maintenance of appropriate structures and plant.

Evidence that you may use to demonstrate that staff meet this requirement include:

- vocational qualifications e.g. NVQs;
- attendance of external or in-house training courses;
- those with approved training to cascade that training to other staff;
- mentoring of inexperienced staff, as part of "on the job" training.

Contractors should be made aware of any aspects of the permit requirements that affect their duties and be competent to undertake their relevant duties.

### **Records**

The keeping and maintenance of adequate and reliable records is fundamental to an adequate management system.

### **Where can I get further information?**

A number of specific training courses are being developed and delivered by companies such as LANTRA, and Quality Meat Scotland. There may be in-house or assurance scheme training courses which meet some or all of these requirements.

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<sup>2</sup> "incident" is defined at the front of all PPC Permits and includes accidents, breaches of permit condition, malfunctions, breakdowns, failures, unauthorised emissions or in the context of agriculture the outbreak of a notifiable disease.

<sup>3</sup> "staff" includes all full time and part time staff (whether employees or self employed).

## **2.2 Raw Materials (Efficient use of raw materials)**

- 2.2.1 The operator shall maintain an inventory detailing typical quantities and associated pollution hazards of raw materials used in the Permitted Installation. This inventory shall be made available to SEPA.
- 2.2.2 Within 18 months of the date of the permit and then at least every 4 years thereafter the Operator shall carry out a systematic assessment of water consumption associated with the Permitted Installation. The purpose of this assessment shall be to identify methods of optimising water use. Each assessment shall be recorded and a report of findings including estimated costs and payback period shall be submitted to SEPA.
- 2.2.3 Within 4 years of the date of the permit and at least every 4 years thereafter the Operator shall carry out a systematic assessment of raw material consumption associated with the Permitted Installation. The purpose of this assessment shall be to identify methods of reducing raw material use. Each assessment shall be recorded and a report of findings including estimated costs and payback period shall be submitted to SEPA.

## **MEETING THESE RULES AND ADVICE ON 'BAT'**

### **Records of raw materials**

The inventory detailing typical quantities and pollution hazards of the raw materials should cover:

- Chemicals including disinfectants, detergents, wood preservatives, slimicides, herbicides, fungicides, insecticides, vertebrate control products and biological pesticides;
- veterinary medicines;
- agricultural fuel oils and lubricants;
- feedstuffs;
- bedding.

Products should be listed individually, by trade names or by active ingredients. Manufacturer's safety data sheets should be retained. The inventory should also record whether they are from an approved list as well as quantities used each year.

Volumes or weights of veterinary medicines held should be listed, the intention is to show what medicines would be stored on site in normal circumstances.

### **Records and review of water use**

You should measure how much water is used on the installation using a water meter(s). Responsibility for monitoring and managing water use should be given to a particular post holder. Water meter readings should be taken on the same day each month. This will enable you to monitor water consumption and identify trends.

You should use your monitoring data to carry out a review (assessment) of water use within the installation. This should be done within 18 months of the date of the permit and then subsequently every four years. As part of this review you should produce a plan for optimising water. The review should consider the following measures:

- Maintaining a plan identifying all water supply and distribution pipe work at the farm;
- insulating exposed water pipes/systems to reduce the risk of freezing pipes;
- installing stop taps and drain valves in the farm water distribution system;
- installing covers on water tanks to reduce evaporation;
- fitting hoses, hand lances and washing equipment with trigger controls;
- taking measures to pinpoint leaks and excessive use including routine checks;
- identifying appropriate locations for water meter(s);
- brushing, scraping and cleaning of dirty areas before washing down;

- minimising the use of high-pressure washers;
- annual calibration of drinking water installations and meters.

#### **Review and record raw materials use**

Raw materials used on your farm should be reviewed every four years with a view to reducing raw material use and any associated environmental impacts. As part of this operators should also consider whether there are alternative raw materials available.

#### **Implementing measures from the assessments**

Any opportunities for improvement identified following your assessment should be discussed with SEPA and a timescale for implementation agreed.

#### **Where can I get further information?**

A template for listing raw materials is given in the permit application form for intensive agriculture.

Approved lists of disinfectants, pesticides and veterinary medicines are:

- The Scottish Executive's approved list of disinfectants;
- Pesticides Safety Directorate/HSE Guide to Pesticides (The Blue Book) Electronic Copy;
- National Office of Animal Health (NOAH) compendium.

Examples of water audits:

- The 4 Point Plan, SEPA, Scottish Executive;
- Waterwise on the Farm, EA/NFU/Linking Environment & Farming (LEAF) guidance;
- Opportunities for Saving Money by Reducing Waste on Your Farm, Defra.

## **2.3 Energy efficiency**

- 2.3.1 Subject to 2.3.2 the operator shall within 24 months of the date of the permit and then at least every 4 years thereafter carry out a systematic assessment of energy consumption associated with the permitted installation. The purpose of this assessment shall be to identify methods of reducing energy use. Each assessment shall be recorded and a report of findings including estimated costs and payback period shall be submitted to SEPA.
- 2.3.2 Notwithstanding condition 2.3.1 assessments of energy consumption do not need to be carried out as long as the installation is subject to a Climate Change Agreement. In the event that the permitted installation ceases to be covered by a Climate Change Agreement, the operator shall provide written notification to SEPA within one month of such cessation.

## **MEETING THESE RULES AND ADVICE ON 'BAT'**

### **Climate Change Agreement**

If you are subject to a Climate Change Agreement then this will meet the requirements of these rules and you do not need to undertake an energy review. You should provide the reference number of your agreement, as evidence, as part of your permit application. If you are not subject to a Climate Change Agreement you should carry out an energy review and make this available to SEPA within 24 months of the date of the permit.

Any opportunities for improvement identified following your assessment should be discussed with SEPA and a timescale for implementation agreed. If you fail to implement the improvements identified SEPA may vary your permit to require upgrade within a specified time. However, it is anticipated that many Operators will find opportunities to reduce energy consumption and costs as a result of the audit.



The following are examples of issues which might be considered:

- applying low energy lighting;
- insulating buildings;
- reducing resistance in ventilation systems by cleaning of ducts and fans;
- applying natural ventilation where possible;
- optimised design of ventilation systems to achieve minimum ventilation rates;
- use of waste heat e.g. from slurry cooling systems to heat farrowing accommodation;
- method of heat production e.g. oil or gas over electricity.

#### **Where can I get further information?**

Examples of energy audits:

- Opportunities for Saving Money by Reducing Waste on Your Farm, Defra;
- Farm Energy Centre audits.

A range of publications on energy efficiency for poultry production and pig rearing can be ordered from the Farm Energy Centre.

The Carbon Trust has produced an Energy Consumption Guide 'Energy Use in Pig Farming'.

## **2.4 Livestock Manure (Slurry and manure storage)**

### **STANDARD PERMIT CONDITION**

- The Operator shall ensure that all slurry and manure management systems within the Permitted Installation are designed, constructed and managed in accordance with the SFIR with the aim of preventing, or where that is not possible, minimising emissions from those systems.

### **DISCRETIONARY PERMIT CONDITIONS (where an upgrade is required)**

- Proposals for upgrading or replacing slurry stores/lagoons/manure storage facilities in operation at the date of the Permit to meet the standards for new slurry stores/new manure stores set out in the SFIR shall be submitted to SEPA within 6 months of the date of the Permit. The proposals shall include a timetable for any proposed improvements.

### **MEETING THESE RULES AND ADVICE ON 'BAT'**

The following outlines SEPA's view of what constitutes the Best Available Techniques (BAT) for the storage of slurry and manure. This guidance is largely based on the requirements and advice contained within the Control of Pollution (Silage, Slurry and Agricultural Fuel Oil) (Scotland) Regulations 2003 (as amended) "SSAFO" and The European BREF note relating to Intensive Agriculture "the BREF".

Please note that unless otherwise specified, this chapter also applies to slurry storage within housing units e.g. under slats. This section should be read in conjunction with section 2.11 of this document which deals more specifically with housing design.

Unless otherwise specified, all terms used in this section have the same meaning as in the Control of Pollution (Silage, Slurry and Agricultural Fuel Oil) (Scotland) Regulations 2003 (as amended) the "SSAFO" Regulations.

In this document “manure” means a mixture consisting wholly of livestock excreta or livestock excreta mixed with bedding and/or feed residues from a building or yard used by livestock of a consistency that does not allow it to be pumped or discharged by gravity.

Please note that there is a legal requirement to notify SEPA at least 28 days before any new, substantially enlarged or substantially reconstructed structure for the storage of slurry is brought into use.

### **Minimum storage capacity of slurry stores**

All New, substantially reconstructed or substantially enlarged slurry storage systems must conform to the following:

Where any part of the installation falls within a “Nitrate Vulnerable Zone” the installation should have sufficient slurry storage capacity to meet the requirements of any Action Program for Nitrate Vulnerable Zones (NVZ legislation) issued by the Scottish Ministers.

All installations producing slurry shall provide a storage system capable of storing the maximum quantity of slurry which is likely to be produced in any continuous six month period, including allowance for rainwater which may fall or drain into the slurry storage system, unless a shorter period can be justified in a Farm Waste Management Plan. Please note that in making these calculations SEPA may take into account other disposal options such as contracts providing guaranteed access to adequate alternative storage capacity located outside the installation or contracts for the transfer of slurries to a person appropriately authorised by SEPA for the collection, recovery or disposal of the material.

The calculation of slurry or manure production on an installation should be done in accordance with either the advice given in the PEPFAA code or within guidance developed to accompany NVZ legislation, whichever is appropriate.

Any calculation of the “capacity” of a slurry storage system should take into account the appropriate depth of “freeboard” for the storage structure. That is 750mm for slurry storage tanks with walls made of earth or 300mm in all other cases.

Operators should also note that before initiating any change in the operation of the installation likely to increase slurry production e.g. an increase in the size of herd or a change to liquid feed. SEPA would expect that before the change takes place that the operator will ensure that sufficient slurry storage is put in place to meet the standards described above. SEPA will not generally sanction changes on sites not meeting these standards without the operator first having agreed an appropriate upgrade plan with SEPA. Unless operators can demonstrate compliance with the above standard any net reduction in slurry storage capacity is likely to be seen as a failure to apply the Best Available Techniques (BAT) and as such be considered to be a breach of the implied condition within the permit.

### **BAT for design, construction and location of slurry storage systems**

All new, substantially reconstructed or substantially enlarged slurry storage systems must conform to the following:

- the requirements of Regulation 3 and Schedule 2 of the “SSAFO” Regulations;
- external slurry stores should also be covered either with a rigid lid, roof or tent structure; a plastic or canvas cover or a floating cover (N.B Materials, such as straw or peat may sink, do not reduce emissions effectively and are not acceptable as cover material<sup>4</sup>). Stores do not need to be covered if they are enclosed within a building primarily used for housing

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<sup>4</sup> The original guidance advising against the use of straw or peat as a covering for slurry stores came from DEFRA in response to the National Emissions Ceilings Directive to reduce ammonia emissions.

livestock or their contents have a dry matter content of less than 1%. *For information on upgrade of existing slurry storage please see notes at the bottom of this section;*

- all facilities should be constructed in such a way as to allow the detailed integrity inspections required below. This is particularly important for below ground/under slat storage.

#### **Additional requirements relating to slurry lagoons**

According to the BREF, a lagoon used for storing slurry is equally as viable as a “slurry tank” providing that it has an impermeable base and walls in combination with a leak detection system. Therefore all new substantially reconstructed or substantially enlarged slurry storage lagoons must:

- have an impermeable base and walls;
- incorporate a leak detection system compliant with the Requirements of SSAFO. NB the leak detection system is not always necessary if the lagoon is constructed of a concrete lining and built to SSAFO standards;
- be subject to a resistivity leak detection survey prior to use (This is a specific type of walkover survey using electrical resistance to locate holes in the liner so that they can be patched before the structure is filled);
- Come with a guarantee or statement from the manufacturer of the liner relating to the design life of that particular liner material for the purpose of holding slurry and a warranty from the installer as to the design life of the structure;
- be welded by suitably qualified personnel accredited by TWI accreditation scheme or equivalent.

In this context a reference to “impermeable” should be taken to mean a barrier with a permeability equivalent to, or lower than, that of one meter of clay at  $10^{-9}$  m per second. BAT for the design and construction of the lagoon is considered to be in accordance with CIRIA Report 126 or equivalent, and, when dealing with a synthetic liner, the manufacturers recommendations.

To demonstrate that all slurry storage systems meet the above requirements, all new infrastructure should be inspected and ‘signed off’ by a suitably qualified structural engineer prior to use. A copy of the appropriate Notification and Certification form is available from your local SEPA office. The completed form should be sent to SEPA 28 days before you intend using the new structure.

**Note on the upgrade of existing stores.** Research has indicated that the formation of a natural crust on top of the slurry store can provide an effective means of reducing ammonia emissions. In certain circumstances it may be possible for operators to demonstrate that they are in a position to generate a natural crust on top of the slurry stores. Where it can be demonstrated that this crust is persistent across the entire surface SEPA may accept this as being equivalent to the installation of a ridged or floating cover.

#### **Appropriate measures for design, construction and location of manure stores**

New, substantially reconstructed or substantially enlarged manure stores must:

- have an impermeable base;

- provide a collection and containment system for liquid run-off (all liquid runoff is considered to be slurry). Run-off can be reduced and effluent management improved by providing a roof or cover;
- be sited where the new facilities are least likely to cause annoyance to sensitive receptors from odour.

### **Inspection and maintenance of slurry storage systems and manure stores.**

All slurry and manure storage systems have the potential to cause significant pollution of both surface and ground waters either following catastrophic failure or resulting from a prolonged chronic leakage. All structures should be inspected and maintained in accordance with manufacturers instructions. Where these are not available a minimum level of inspection is set out below.

- Inspection of all structures and valves should be carried weekly. The operator should ensure that all parts are working correctly, that valves are set in the correct position and look for evidence of leakage including enrichment of the surrounding soil.
- Annual inspection - All storage structures (other than earth banked lagoons) should be emptied, cleaned and inspected. A record of this having been done and any findings should be held on site.
- Professional inspection (slurry only) – A full inspection of the structural integrity of slurry storage systems (other than earth banked lagoons and tanks used for the periodic storage of wash water from poultry sheds) should be carried by a suitably qualified professional every 5 years. A record of this having been done and a copy of the inspectors report should be held on site.
- Slurry lagoons - If using a synthetic liner the lagoon should be emptied and the liner replaced at the end of the design life of the membrane (as guaranteed by both the manufacturer of the membrane and installer of the liner). Where such guarantees are not available this should be done every 10 years. Where the lagoon has been constructed with an appropriate design of leak detection system this timescale can be extended to 15 years.

If following an inspection it is determined that maintenance work will be required the operator should inform SEPA that a problem has been identified and advise of the intended remedial action.

**Safety note: Enclosed structures or tanks may contain lethal or explosive gases. Do not go into them. If in any doubt seek advice from the Health and Safety Executive.**

### **Appropriate measures for operations of slurry storage tanks and manure stores.**

For slurry storage tanks, which do not have a cover, the following measures apply:

- disturbance to the surface must be minimised;
- slurry stirring should be minimised - although it is recognised that slurry mixing may be necessary to produce a suitable material for land application;
- slurry should be introduced below the surface to reduce emissions of ammonia and odour. This is not a requirement for slurry stores under slatted livestock housing.

And for manure storage:

- the dry matter content of manure should be maintained above 60% to minimise the emission of ammonia. Where this is not technically feasible the manure should be kept as dry as possible.

### **Upgrade timetable**

Where the discretionary condition (above) is placed in a Permit, the operator will be required to bring forward proposals for upgrading existing equipment to the standards being applied to new or renovated infrastructure.

The following upgrade timescales are provided to try and ensure consistency in the implementation of upgrade requirements. Although indicative, these timescales represent the maximum time SEPA expects to allow operators in terms of upgrading existing structures to the standards given in this document. However, SEPA also recognises that a degree of flexibility may be necessary in exceptional cases to incorporate upgrades into wider development of an installation where these are planned and well defined. N.B where specific environmental problems are identified timescales may be shortened.

- Unlined slurry lagoons not compliant with the definition of “impermeable” given above – 30 months from the date of issue of the permit.
- Slurry lagoons lined with a synthetic liner – The lifetime of the current liner as guaranteed by the manufacturer and installer or, where no guarantee is available, once the existing liner had been in place for 10 years. Where the lagoon has been constructed with an appropriate design of leak detection system this timescale can be extended to 15 years.
- Uncovered slurry stores – 6 years from the date of the permit. In exceptional circumstances and with the agreement of SEPA this timescale may be flexible to avoid the need to cover structures which are shortly thereafter to undergo replacement or substantial renovation in line with the requirements of this document.
- Structures not meeting the technical standards set out in Schedule 2 of SSAFO – Variable depending on the issue but a maximum of 6 years.
- Installations with insufficient capacity to meet the slurry storage requirements for new slurry stores will have to meet this requirement within 6 years of the issue of the permit or within any time period which may be required by NVZ legislation (whichever is sooner). However it should be noted that no change or expansion in operations which is likely to increase slurry production will be permitted while the slurry capacity remains deficient please see the section on storage capacity above.

### **General advice relating to field storage**

Storage of manure outwith the site of the installation is not controlled directly under the permit however in general terms.

You should not site field heaps:

- over field drains;
- within 10m of a watercourse (or a greater distance if there is a risk of effluent run-off into a watercourse);
- within 50m of a spring, well or borehole that supplies water for human consumption, or is to be used in farm dairies;
- where they would cause odour problems for nearby residents.

Poultry litter should be stored in a densely packed heap with an "A" shaped profile to minimise water ingress and ammonia emissions.

## Where can I get further information?

Advice on constructing slurry stores is in Chapter 4 of the Prevention of Environmental Pollution from Agricultural Activity Code of Good Practice [PEPFAA Code]

You can obtain the following Construction Guidance Notes from Acorus (formerly published by ADAS):

- CGN 100 Organising contracts for farm waste structures (manure and slurry);
- CGN 001 Above-ground circular concrete and rectangular weeping-wall slurry stores;
- CGN 002 Earth-banked slurry stores;
- CGN 003 In-situ concrete slurry stores;
- CGN 004 Above-ground circular steel slurry stores;
- CGN 010 Sluice valves on steel and concrete circular above-ground slurry stores;
- CGN 011 The use of covers on circular steel and concrete slurry stores.

CIRIA report 126 'Farm waste storage - guidelines for construction' details design and construction guidance for storage facilities. (This can be purchased from CIRIA or obtained through a library - ISBN: 0-86017-352-6).

Further general advice on the management of slurries and manures is available in the 'Four point plan for improved farm waste management' 2<sup>nd</sup> edition 2004.

Further general guidance on slurry storage and Best Available Techniques for intensive agriculture is contained in "Integrated Pollution Prevention and Control (IPPC) Reference Document on Best Available Techniques for intensive rearing of poultry and pigs"

## 2.5 Waste Management

- 2.5.1 The Operator shall maintain a record of the location, estimated quantities and types of all wastes stored within the Permitted Installation.
- 2.5.2 Within 12 months of the date of the Permit and then at least every 4 years thereafter the Operator shall carry out a systematic assessment and review of the management of all wastes generated within the Permitted Installation. The purpose of this assessment shall be to identify methods of preventing waste generation, and where waste is produced it is, in order or priority prepared for re-use, recycled, recovered or where that is technically and economically impossible disposed of while avoiding or reducing the impact on the environment of the handling and disposal of wastes. Each assessment shall be recorded and a report of findings including estimated costs and payback period shall be submitted to SEPA.

### MEETING THESE RULES AND ADVICE ON 'BAT'

You should carry out a waste minimisation review within 12 months of the issuing of the permit and make this available to SEPA. The review should consider the following:

- whether you can avoid producing a waste;
- whether you can reduce the amount of waste produced;
- whether waste produced can be re-used, recovered or recycled;
- how the environmental impact of waste disposal can be minimised.

All waste streams emanating from the installation should be considered in the assessment including; carcasses, feed waste, fuel oil and lubricants, scrap metals and packaging.

Any opportunities for improvement identified during the assessment should be discussed with SEPA and a timescale for implementation agreed.

The PPC Regulations require the site of the installation to be restored to a satisfactory state before the permit can be surrendered (on closure of the installation). The presence of waste residues on the site at that time could prejudice the acceptance of the site as finally restored.

### **Carcass Management**

The regulation of animal by-products is the primarily the responsibility of Animal Health and the Local Authorities. Notwithstanding to comply with BAT you should ensure that:

- Carcasses are disposed of in accordance with the Animal By-Products (Scotland) Regulations 2003.
- Carcasses being removed off-site are only given to appropriately licensed knackerman, rendering plant, hunt kennel, maggot farm or authorised incinerator. They should be removed frequently and be secured from away from vermin, birds and insects.
- Carcasses disposed of on-site are only incinerated in an approved incinerator licensed under the Animal By-Products (Scotland) Regulations 2003.

### **Where can I get further information?**

There is an example of a waste minimisation audit in Opportunities for Saving Money by Reducing Waste on Your Farm, Defra.

SEPA's website contains information on the Waste (Scotland) Regulations 2005 and the controls that apply to agricultural waste.

The Four Point Plan – SEPA, Scottish Executive, NFUS

The Prevention of Environmental Pollution from Agricultural Activity Code of Good Practice (PEPFAA code).

## **2.6 Individual Source Emissions to Air, Water or Land**

2.6.1 Unless specified elsewhere in this Permit, there shall be no individual source emissions from the Permitted Installation to the water environment, air or land.

2.6.2 Unless otherwise stated in this Permit, individual source emissions of roof water and drainage from yards shall be treated either by means of a swale, constructed wetland, soak away, settling pond, or sediment trap constructed and maintained in accordance with the SFIR.

### **DISCRETIONARY PERMIT CONDITIONS (where an upgrade is required)**

- Within 12 months of the date of the permit the operator shall carry out a systematic assessment of site drainage within the permitted installation. The purpose of this assessment shall be to identify methods of reducing the impact on the environment of site drainage. The assessment shall be recorded and a report of findings including estimated costs shall be submitted to SEPA within 4 weeks of the completion of the assessment.

(please note this condition may be under the heading "diffuse emissions" in Schedule 3 of the Permit)

## **MEETING THESE RULES AND ADVICE ON 'BAT'**

Individual source emissions are defined in a Permit as “emissions of substances into the air water or land by means of a fixed installation, pipe, chimney, exhaust outlet or similar emission point but excluding emissions from animal housing ventilation including vents with fans”. The PPC permit application form asks for point source emissions to be identified. These point sources must be shown in the Permit. If they are not identified you may be making an emission in breach of the Permit.

### **Treatment for Individual Source Emissions to the Water Environment**

Rule 2.6.2 requires that all individual source emissions of water from roofs and drainage yards be treated prior to discharge by one of the means listed or as otherwise specified in the Permit. The purpose of this condition is to ensure that installations minimise their impact on the water environment both in terms of pollution and the direct hydraulic impact the discharge may have e.g. erosion of the stream bed/bank. All of the methods mentioned in the rule (assuming they are installed and maintained appropriately) will provide a degree of treatment for any runoff water and in most cases will have the effect of attenuating the flows and allowing for the slow controlled release of water into a watercourse following rainfall. A further supplementary benefit is that some of these systems can provide a last line of defence in the case of an accidental spill of material on the steading.

### **Restrictions imposed by the Sludge Slurry and Fuel Oil Regulations (SSAFO)**

The choice of technique will to some extent depend on the availability of land, the topography of the site and the nature of the discharge; however it is also important to note the limitations placed on operators by the SSAFO Regulations.

As discussed in section 2.4 of this document the SSAFO Regulations defines the term slurry pretty widely such that any runoff water that contains excreta, bedding, feed residues or washings from a building is defined as slurry. In general terms SSAFO requires that slurry produced on the farm is captured and stored before spreading. However, some slurry is exempt from this requirement assuming that it is treated by way of a constructed farm wetland before discharge.

In general terms this is slurry which consists mainly of rainwater and washings deriving from–

- (a) a midden, which contains in a substantial majority farm yard manure
- (b) an area or pathway where that area or used by livestock to move from one area to another

N.B some restrictions to the above are in place please consult the SSAFO Regulations (as amended) for precise detail.

### **Concerns Relating to Disease Control**

Operators should be aware that Animal Health have expressed concern at the potential for areas of water to attract waterfowl into the vicinity of the installation. Waterfowl are a potential source of avian influenza viruses. Infected birds tend not to show clinical signs of disease themselves, but do act as a reservoir of infection for domestic poultry, leading to outbreaks of highly pathogenic disease. This concern also extends to intensive pig units as pigs play a role in the modification of influenza viruses, and the presence of pigs in an area where there are avian influenza viruses has the potential for “re-assortment” of those viruses (leading to different, or new strains of avian influenza, or potentially those that could have more of an effect on humans). While there are a number of techniques that can be employed to reduce this threat such as reducing the extent of open water or increasing the distance from the housing, SEPA does accept that this is a legitimate and important consideration and would advise all operators to discuss their plans with Animal Health.

### **General Requirements to comply with rule 2.6.2**



- Unless specifically allowed by your Permit there should be no untreated point source emissions directly into surface water.
- Treatment methods should be appropriate to the contamination, the receiving water and all Regulatory requirements including SSAFO Regulations
- All new systems should be designed and constructed, in accordance with the standards referenced in this document or other equivalent standard.
- All systems should be operated and maintained in accordance with the standards referenced in this document or other equivalent standard.
- Notwithstanding systems should be operated and maintained to provide effective treatment for contaminated runoff such that there is no pollution of the receiving watercourse or that pollution is minimised.

### **Constructed Farm Wetlands (CFW)**

Under the SSAFO Regulations if you are going to treat (as opposed to collect store and spread) liquid runoff that contains any faecal, bedding or feed material “slurry” (as defined above) your only option is to build a CFW.

Constructed farm wetlands are an ecologically engineered system, often comprising of a series of one or more constructed ponds, sited in proximity to farm steadings and which are intended to receive and treat ‘lightly contaminated’ runoff. ‘Lightly contaminated’ can be defined as a mixture consisting predominantly of rainwater and drainage from roofs or from yards used by livestock and/or machinery on an occasional basis. It may also be contaminated with soil, silt, excreta or other organic material.

The term ‘Constructed Farm Wetlands’ cover a number of different systems that are designed to contain shallow water and which are planted with emergent wetland plants such as common reed. These plants have the ability to remove many pollutants from contaminated water. The treatment mechanisms are varied and include combinations of adsorption, sedimentation, biological uptake, predation, UV degradation and microbial transformation.

Further information can be found on the SEPA website at:

<http://apps.sepa.org.uk/bmp/ShowPractice.aspx?bmpNumber=75>

Standards for the design, construction, operation and maintenance are contained within the document.

“Constructed Farm Wetlands (CFWs) Design Manual for Scotland and Northern Ireland” published jointly by SEPA and the Environment Agency for Northern Ireland. A copy of this document can be found by using at the following address:

[http://www.sepa.org.uk/land/land\\_publications.aspx](http://www.sepa.org.uk/land/land_publications.aspx)

Please note that capital grants may be available for the construction of CFWs through the Scottish Rural Development Program (SRDP). Please see the following website for more details.

<http://www.scotland.gov.uk/Topics/Rural/SRDP>

### **Other Sustainable Drainage Systems (eg. Swale, retention pond or detention basin)**

Where runoff does not contain slurry or only contains incidental amounts of faecal, bedding or feed materials there is the option of discharging the water to a swale or other Sustainable Drainage System (SUD) these include but are not limited to swales, retention ponds or detention basins. These will ameliorate flows and provide a degree of treatment for pollutants particularly suspended solids. In this context incidental contamination should be seen as

contamination which is low level and infrequent. Incidental contamination would not be expected to lead to any pollution of the receiving watercourse or groundwater following treatment in the SUD system.

It is worth noting that certain areas of the yard may periodically be subject to greater contamination e.g. during washout or during periods of animal movement. If you propose using one of these systems it will be necessary under these circumstances to divert any runoff to separate 'foul' (dirty water) drainage system or holding tanks during these periods. Industry practice would normally be to divert run-off to holding tanks during the cleaning out period and spread the waste water collected to land.

Swales and grassed waterways are shallow broad grassed depressions, usually following natural features. They can lead run-off water from near its source to a suitable outfall or further treatment, provide temporary storage of run-off and slow down the rate of water flow. The run-off volume may be reduced by evaporation and infiltration. To function properly, they must be dry much of the time, carrying water only during and shortly after rain. They offer some treatment either by infiltration in suitable soils or by slowing down water flow. Vegetation within the channel may act as a filter in removing some of the sediment. A useful conveyance system they can be more cost effective than installing pipes. There are a number of different designs and can be used in combination with other techniques such as filter strips and retention basins to provide a more complete treatment for runoff.

Further information on Swales can be found on the SEPA website at the following address:

<http://apps.sepa.org.uk/bmp/ShowPractice.aspx?bmpNumber=72>

The Northern Ireland Environment Agency has also published guidance on constructing swales on poultry farms – 'Guidelines for construction of swales for water quality improvement and flow attenuation of lightly contaminated runoff from poultry farms'. Available at the following internet address:

<http://www.ni-environment.gov.uk/pubs/publications/swaleguid.pdf>

Detention basins or ponds are normally dry basins designed to temporarily store and slowly release run-off water. The water is released through a restricted outflow control which results in a longer detention than would otherwise be the case and consequently better removal of particulate pollution by settlement. The main function of detention basins is to hold water and therefore reduce peak flows. The degree of pollutant removal depends largely on the detention time. With a normal detention basin this may only be a few hours and little treatment will occur. If the detention time is increased to 24 hours or more, the basin would be referred to as an extended detention basin and increased treatment would result.

Further information on detention basins can be found on the SEPA website at the following address:

<http://apps.sepa.org.uk/bmp/ShowPractice.aspx?bmpNumber=73>

Retention ponds or basins are designed to retain some water at all times but have an allowance for large variations in level (volume) during storms (this is in contrast to a detention pond or basin which is designed to temporarily store and slowly release run-off water without treatment of pollutants). Water leaves the pond via a restricted outflow, sized to give an appropriate retention time. An overflow for extreme events is essential, preferably arranged so that only the first flush run-off of large storms passes through the pond. Retention periods vary but for significant biological treatment of, particularly, dissolved pollutants to occur, at least 20 days is recommended. For some purposes such as phosphorous removal, much longer retention periods of at least 40 and possibly up to 100 days would be required. The practicality of this will depend on individual farm situations.

Further information on retention ponds can be found on the SEPA website at the following address:

<http://apps.sepa.org.uk/bmp/ShowPractice.aspx?bmpNumber=74>

Standards for the design, construction, operation and maintenance of any SUD system are contained within the document.

CIRIA document C697 (2007) "The SUDS Manual" (available from the CIRIA website <http://www.ciria.org/downloads.htm>) or an equivalent standard.

### **Use of Soak Away**

Soak away should only be considered for the cleanest of discharges where no other SUD option is available. The direct discharge of Ammonia to groundwater is prohibited unless under authorisation from SEPA. Unless it categorically states otherwise, a PPC Permit does not provide this authorisation. Operators need to be confident that any runoff discharged into a soak away is free from ammonia before considering this option e.g. Poultry dust is usually high in ammonia so the runoff needs to be free of this pollution.

### **Roof water**

Roof water may be contaminated with dust from housing resulting in high ammonia levels. However where there are no roof outlets and an operator can demonstrate that the roof remains dust free, roof runoff does not normally require interception and treatment. In certain systems 'high velocity' roof vents may mean that no dust is allowed to build up on the roof. Where this is the case operators should state this in their Permit application. Where it can be demonstrated that roof runoff water will not be contaminated, the permit may allow for direct discharge of roof water onto unmade ground without interception and treatment. All other systems mentioned above including soak away may also be used.

### **Monitoring**

All operators should periodically inspect their drainage, treatment systems and any outfalls to ensure that they are operating appropriately and that any impact on the receiving watercourse is minimised.

### **Undertaking a systematic assessment of site drainage**

Many Permits will contain a requirement in Schedule 3 for Operators to undertake a systematic assessment of site drainage with a view to identifying methods of reducing the impact on the environment and producing proposals for meeting rule 2.6.2. A suggested methodology for undertaking a drainage assessment is set out below:

1. Develop a drainage plan - This is the basis of any assessment. You need to know where your drains start (inlets) and where they go (outlets). This is best done on a map or plan.

You should show:

- both the foul and surface water drainage/slurry systems (this need not be on the same map) including perforated drains under unmade ground and showing the direction of flow;
- the inlets to drains;
- the location of diverter valves, manholes, inspection chambers;
- the drainage channels in relation to the buildings on site;
- the locations of any holding tanks or treatment system e.g soak away etc;
- the location of inlets to treatment systems CFW, swales etc;
- the location of the outfalls from drains or treatment systems in to the water environment;
- the extent of concrete, permeable un-vegetated surfaces and grassed areas;
- location of any abstraction or borehole (including domestic water supplies if relevant).

You may be able to do much of the work from plans already in your possession or material that was prepared as part of your Permit application, however, it may be necessary to physically investigate some parts of your system. Techniques such as dye testing of drains can be very useful in identifying the path of a drainage channel. Please notify SEPA before undertaking

dye testing operations. In all cases operators should inspect the site to confirm the details presented on the plans and identify outfalls and record any issues of concern such as blocked drains broken pipe work, evidence of pollution in the watercourse.

2. Identify direction of runoff – The next step is to identify where runoff from any particular roof or surface goes. This may be to a drain or it may just shed naturally from surfaced areas onto porous ground. N.B Where this is the case operators must ensure the runoff is not classed as slurry as this is likely to be a breach of the SSFO Regulations.

3. Identify Contamination level – In order to assess the suitability of any drainage system it is necessary to assess the level of contamination in runoff waters. Is there likely to be any wash water, faecal material, bedding or feed residue present, do these areas get affected by mud from farm vehicles?

Having done this it may be necessary to zone your plans to indicate the type of runoff from a given area e.g.:

- Slurry which must be collected and spread
- Slurry which must be treated by a CFW or collected and spread
- Lightly contaminated runoff suitable for either a swale/SUD, CFW or collected and spread
- Clean runoff suitable for either a soak away, swale/SUD, CFW or collected and spread
- Clean roof water discharged direct to unmade ground

You will note that the cleaner the area the greater the variety of treatment options available to you. Good management of your site will limit the polluting potential of runoff and maximise the options available to you.

This information will be needed to justify using a particular type of treatment on site. You should note however that the level of detail required will vary depending on the number and type of treatment systems you propose using. If for example you intend to use a CFW for collecting all the runoff from your steading there is no need to zone you plan other than to indicate any area from which the runoff requires to be collected and spread.

While undertaking this exercise, there may be areas of the yard which are generally clean but may periodically be subject to greater contamination e.g. when undertaking washing or livestock movement. Your drainage assessment should in these circumstances describe any management practice and/or infrastructure you may have to control and/or divert highly polluting effluents away from a system that may be suitable for most of the time but is not appropriate for high strength runoff. If no such systems/proposals are in place all runoff from that area should be considered to be contaminated.

Please note that any runoff which may be contaminated with fuels, oils, pesticides or disinfectants or pressure washing effluent should not be discharged to a CFW, swale/SUD or soakaway.

4. Describe the nature of any current treatment – This will help you and SEPA to assess whether any treatment you currently have in place is appropriate or whether further treatment is necessary to meet the requirements of rule/condition 2.6.2. You should describe the infrastructure in detail.

5. Propose any changes you think may be necessary to your current drainage system and submit these outline proposals along with your drainage plan to SEPA.

This proposal should be a draft proposal with some detail. Specifically you should address the following:

- Treatment methodology(s) to be used
- Approximate location and sizes
- The areas of the site from which they will receive drainage

- Any proposals for emergency shutoff
- Proposed timescales for the work

### **What happens next?**

On receipt of your drainage plan SEPA will make an assessment of what you are proposing. This assessment may include a site visit to verify the information received and to discuss your plan.

It is hoped that agreements can be reached with operators as to the changes required (if any) and the timescale for the improvements. The improvements may be phased in over a period of time but it is expected that all existing sites will meet the standards set out above within 3 years of the issue of their Permit. However if your timescale is longer than that suggested please indicate that in your drainage review. It may be that this is acceptable given your site specific circumstances and the amount of work involved (new build sites should be compliant with the above before going into production). It is anticipated that a timetable will be agreed between the operator and SEPA which in certain circumstances may be placed as a condition in the Permit formalising the upgrade requirements.

### **Where can I get further information on Individual Emissions?**

Animal by-product incineration - The Defra Animal By-Products Regulations web pages have further information on the Animal By-Products Regulations and on incinerators. See address below:

<http://www.defra.gov.uk/animalh/by-prods/incinerators/index.htm>

## **2.7 Diffuse emissions of substances excluding odour and noise**

### **STANDARD PERMIT CONDITIONS**

- 2.7.1 Subject to conditions 2.8.1 and 2.9.1 the operator will prevent or where that is not possible, minimise diffuse source emissions.
- 2.7.2 Notwithstanding condition 2.7.1 there shall be no diffuse source emissions of any pollutants to groundwater or soil from the permitted installation.
- 2.7.3 The operator shall maintain plans of the surface and foul water drainage system including all sub-surface sumps and storage vessels that are used or have been used within the permitted installation from the date of the permit until the permit is surrendered. Details of any changes made to drainage systems during the lifetime of the permit shall also be maintained.
- 2.7.3 Disinfectant footbaths shall not be allowed to overflow. The spent disinfectant contained in footbaths and wheel washes shall be stored securely prior to disposal.
- 2.7.4 Containment shall be provided for foodstuffs to prevent spillages and minimise waste. This containment shall be protected from collision damage.
- 2.7.5 All agricultural fuel oil storage facilities shall meet equivalent standards to those set out in the Water Environment (Oil Storage) (Scotland) Regulations 2006.
- 2.7.6 Pesticides and veterinary medicines shall be kept in a store that is resistant to fire, capable of retaining leakage or spillage, dry, frost-free and secure against unauthorised access.

### **DISCRETIONARY PERMIT CONDITIONS (where an upgrade is required)**

- Within 12 months of the date of the permit the operator shall carry out a systematic assessment of site drainage within the permitted installation. The purpose of this assessment shall be to identify methods of reducing the impact on the environment of site drainage. The assessment shall be recorded and a report of findings including estimated costs shall be submitted to SEPA within 4 weeks of the completion of the assessment.
- All excess spray and liquid runoff from any equipment used for the automatic disinfection of vehicles shall be collected and contained.

## **MEETING THESE RULES AND ADVICE ON 'BAT'**

For farming installations, diffuse emissions are defined as those not listed as individual source emissions.

The following are the appropriate measures SEPA expects to be in place at the farm.

### **Building and site maintenance**

You should -

- maintain buildings in good repair to
- minimise water leaks into the housing which may increase the moisture content of litter and manure.
- You should keep areas around buildings free of any build up of manure, slurry and spilt feed.

### **Management of drainage systems and run-off**

Many of the measures required for reducing pollution from point source emissions are also relevant measures to prevent pollution by diffuse emissions to water and land.

- Clean water drainage systems should not be contaminated. Under no circumstances should slurry (including seepage from manure) be allowed to enter surface water drains or drain into the ground.
- The contamination of yard areas should be minimised to reduce the amount of contaminated water that requires disposal. This should include:
  - keeping yards visibly clean;
  - keeping drainage channels clear;
  - cleaning up accumulations of spilt feed and dust.
- Drainage from animal housing and water from cleaning these areas out is considered to be slurry and therefore should be collected in a tank or lagoon prior to land spreading or disposal.
- Drainage from yards in regular use by livestock, or drainage likely to be contaminated by manures or slurries should be collected in slurry or dirty water tanks.
- Where the ventilation system has outlets through side-walls, interception is required before drainage reaches surface water systems.
- Where side-wall outlets are located above grass areas, further interception is not required provided that the grass cover is sufficient to collect the dust and to impede run-off to surface water systems.
- Where side-walls outlets are located above yard areas, the dust should be removed regularly (so that the yard is kept visibly clean).

- Roof water from housing where there are no roof outlets does not necessarily require interception and treatment.
- Procedures should be put in place to prevent contamination of surface water systems and divert drainage to slurry or dirty water tanks at other times. This can be achieved through the use of temporary bunds around drains, diverter valves or drain blockers.
- Where diverter valves are used to direct dirty water from yards to storage tanks the following measures should be taken:
  - the location of the diverter valve should be detailed on the incident management plan and/or drainage plan;
  - responsibility should be allocated to a member of staff and a deputy for management of the diverter valve.

Proposals for reducing the impact of drainage should consider how the standards given above are to be met. Where you will not be able to meet these standards explain why your proposals represent the best techniques available to you on your site. If you fail to implement the improvements identified SEPA may vary the conditions of your permit to require upgrade within a specified time.

#### **Disinfectant footbaths**

- Spent disinfectant from footbaths and wheel washes should be added to the slurry store contents and applied to land or added to the liquid storage tanks and exported from the site.

#### **Foodstuff**

- You should store dusty or potentially dusty foodstuff materials in covered containers, purpose-built silos or under cover.
- The transfer of foodstuff to and from storage areas should be carried out so as to prevent or minimise dust emissions to air.
- The mixing and milling of dry foodstuff should be carried out so as to prevent or minimise dust emissions to air.
- Measures may include extraction and abatement of dust from feed preparation areas.
- Containment should be provided for foodstuff in order to prevent spillages and minimise waste. Any foodstuff which might flow under the influence of gravity (e.g. liquid feed) should be contained. Containment should consist of:
  - a bunded area, or
  - siting the store in an area isolated from the surface-water system such that any spillage cannot enter any drainage system.
- Storage vessels for foodstuff should be protected from collision damage. Collision protection may be achieved by:
  - careful siting relative to traffic flows with measures such as provision of kerbs or other markers to stop reversing vehicles, or
  - by the use of barriers in more vulnerable locations.

#### **Poultry dust management**

- Dust emissions from buildings should be minimised.
- Dust generation may be controlled within the house through the management of the litter and air quality, which needs to be balanced with the need to minimise ammonia and odour.
- Choice of appropriate litter material and feed type, and minimal disruption to the birds should be used to control dust.

## **Agricultural fuel oil and other chemicals storage**

- Agricultural fuel oil, pesticides and veterinary medicines need to be contained in an area capable of retaining any spillage.
- You must ensure that all agricultural fuel oil storage facilities are bunded. Oil bunds will be expected to meet standards equivalent to the Water Environment (Oil Storage) (Scotland) Regulations 2006.
- Pesticides and veterinary medicines must also be kept in a store that is resistant to fire, dry, frost-free and secure against unauthorised access.
- Veterinary medicines are considered to be those listed by the National Office of Animal Health and do not necessarily require prescription or administration by a veterinary surgeon.

### **Where can I get further information?**

SEPA's Pollution Prevention Guidance Notes cover a range of pollution prevention topics. They advise on statutory responsibilities and good practice to protect the environment.

Advice on managing poultry litter can be found in the Defra booklet 'Poultry Litter Management' (PB1739).

The Silage Slurry and Fuel Oil and Oil Storage Regulations can be downloaded via the following:

<http://www.sepa.org.uk/regulation/oilstorage2006/index.htm>

[http://www.sepa.org.uk/groundwater/legislation/silage\\_slurry\\_a\\_f\\_o.htm](http://www.sepa.org.uk/groundwater/legislation/silage_slurry_a_f_o.htm)

You can find information and design details on constructing bunds from the following CIRIA/SEPA joint guidelines:

- Concrete bunds for oil storage tanks
- Masonry bunds for oil storage tanks

You can download the following Construction Guidance Notes from Acorus (formerly published by ADAS):

- CGN 008 Separation of Clean and Dirty Water, Dirty Water Storage, Yard Area Construction
- CGN 009 Bunds for Agricultural Fuel Oil Tanks

Information on storing pesticides can be found in the Pesticides Safety Directorate/HSE Code of Practice for the Safe Use of Pesticides on Farms and Holdings (The "Green Code").

## **2.8 Odour**

- |       |   |
|-------|---|
| 2.8.1 | All emissions to air from the permitted installation shall be free from offensive odour, as perceived by an authorised person, outside the site boundary. |
| 2.8.2 | The operator shall: <ul style="list-style-type: none"><li>(a) Implement and maintain an "Odour Management Plan" designed to meet the</li></ul>            |



requirements of condition 2.8.1;

- (b) Review the Odour Management Plan at least every 4 years or as soon as practicable after a complaint, (whichever is the earlier) and record whether changes to the plan should be made. Any appropriate changes identified should be implemented as soon as reasonably practicable.

### **How can I meet the requirements of this rule?**

An odour management plan describes the measures you will take to manage odour from the installation and should be provided in your permit application. You can get further information on odour control and how to write an odour management plan in Appendix 4 to this document.

The plan should be implemented to a timescale agreed with SEPA. It should be reviewed following complaints and in any event at least once every four years.

Requirements to control odour will be site specific, depending on the location of the farm. The farm should be operated in accordance with the odour management plan.

### **Where can I get further information?**

Horizontal Guidance for Odour (IPPC H4: Horizontal Odour Guidance. Part 1: Regulation and Permitting and Part 2: Assessment and Control) that other IPPC regulated sectors use.

Further advice on reducing odour emissions is available in [The Prevention of Environmental Pollution From Agricultural Activity Code of Good Practice](#). (The PEPFAA code)

## **2.9 Noise and Vibration**

2.9.1 Emissions from the permitted installation shall be free from noise and vibration at levels likely to cause pollution, as perceived by an authorised person outside the site boundary.

2.9.2 The operator shall:

- (a) Implement and maintain and implement a noise management plan designed to meet the requirements of condition 2.9.1;
- (b) Review and record at least every 4 years or as soon as practicable after a complaint, (whichever is the earlier) whether changes to the plan should be made. Any appropriate changes identified should be implemented as soon as reasonably practicable.

### **How can I meet the requirements of these rules?**

A "Noise Management Plan" describes the measures you will take to manage noise from the installation. You can get further information on noise control and how to write a noise management plan in Appendix 5 to this document.

The plan should be implemented to a timescale agreed with SEPA. It should be reviewed following complaints and in any event at least once every 4 years.

Requirements to abate noise will be site specific, depending on the location of the farm.

The farm should be operated in accordance with the noise management plan.

The odour/noise boundary will be specified in the permit and will reflect the boundary beyond which nuisance from odour and noise will be assessed.

### **Where can I get further information?**

‘SEPA Guidance on the Control of Noise at PPC Installations’

Horizontal Guidance for Noise (IPPC H3: Part 1 – Regulation and Permitting and Part 2 – Noise Assessment and Control) that other IPPC regulated sectors use.

ADAS for Defra:                      Guidance on the control of noise on pig units;  
    Guidance on the control of noise on poultry units.

## **2.10 Livestock Diet Selection and Use of Feedstuffs**

2.10.1 The operator shall provide livestock with a diet which minimises the excretion of

- nitrogen; and
- phosphorus

whilst ensuring the correct dietary needs of the livestock are met.

2.10.2 The operator shall keep a record of the diets fed to livestock over the growing cycle. The records required under this condition shall be kept on site and made available to SEPA on request.

### **How can I meet the requirements of these rules?**

The aim of controlling diet selection is to ensure that the excretion of Nitrogen and Phosphorous (from pigs) is minimised. You should discuss the formulation of the diet with a nutritional advisor or supplier to ensure that the minimum dietary requirements of the animals are being met.

As animals age (both pigs and poultry) their protein requirement per kg of live weight changes. Where only one diet is fed, young animals are under-supplied with protein and lean growth is not maximised, and older animals may be oversupplied with protein and expend energy in excreting it. This contributes to unnecessary ammonia emissions to the air and high nitrogen levels in excreta. The timing of the change from one diet to the next will differ according to the genetics of the stock and management on the unit.

The energy and protein requirements of sows also vary according to their stage in the production cycle. Sows at conception, in very late pregnancy and whilst lactating, have a higher requirement for protein than dry sows. Pregnant gilts may require a higher protein diet than subsequent parities. Feeding a minimum of two diets to sows also has benefits for the lifetime performance of the sow and litter and significantly reduces the amount of excess protein, and so nitrogen, fed. As a guide, the lower protein diet is likely to be used for at least three-quarters of the gestation period.

Lower phosphorus levels in diets will reduce phosphorus excretion and so reduce phosphorus levels in slurry/manure.

### **Pig Production**

- A minimum of two diets should be provided to pigs over the complete production cycle.

- For the antenatal period, during lactation, and for some time post weaning the diet should be formulated to meet the nutritional requirements of the lactating sow.
- The dry sow diet should have a lower level of crude protein than the lactating sow diet.
- As a guideline and taking into account the nutritional requirements of the animal, where a two-diet system is used for rearing and finishing pigs between 30 and 90kg, the change over should be made at around 50 to 60kg. The latter diet should have a lower crude protein level. Where higher numbers of diets are used, the change should be appropriate to the life stage.
- Where rearing and finishing pigs are routinely taken to weights over 115kg, a third diet shall be fed at 90kg and above with a further reduced protein level.
- Phosphorus levels in rations for pigs should be reduced over the production cycle.
- The addition of digestible phosphorus or the use of enzymes such as phytase will ensure optimum performance and maintenance, whilst limiting the excretion of phosphorus.

### **Poultry Production**

- Broilers and broiler breeders should be fed a minimum of three diets.
- Commercial laying hens should be fed a minimum of three diets over the cycle.
- For replacement layer pullets and rearing of breeding stock, a minimum of two diets should be used between hatching and point of lay for optimum feed utilisation.
- Ducks should be fed a minimum of two diets over the production cycle.
- The whole wheat feeding system, where a quantity of wheat is mixed with compound feed, is permitted and meets the requirements of this rule, provided that the birds are fed diets with reducing protein content over the growing period. This feeding system in effect provides a number of diets as the inclusion of wheat is increased.
- The use of phytase enzyme may be considered as a means to increase availability of phosphorus from vegetable sources and so reduce total phosphorus levels in the diet. Please check to ensure that enzyme products are licensed for use in feed.
- Minimum phosphorus content in litter and manure may be specified in contracts for litter-burning power stations.

## **2.11 Housing Design and Management**

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| <p>2.11.1 Housing should be designed and managed to minimise emissions.</p> <p>2.11.2 Any water used for cleaning within housing shall be collected and stored safely in a tank until export from the permitted installation can take place.</p> <p>2.11.3 Drinkers and troughs shall be designed and operated to prevent leakage.</p> <p>2.11.4 The operator shall implement and maintain a system to record the number of animal places and movements.</p> <p style="text-align: center;"><b>For existing housing</b></p> <p>2.11.5 Within 24 months of the date of the permit the operator shall carry out a systematic assessment of existing housing and management practices within the permitted installation. The purpose of this assessment shall be to identify methods of reducing emissions to the environment. The assessment shall be recorded and a report of</p> |
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findings including estimated costs shall be submitted to SEPA. Appropriate improvements identified shall be implemented in accordance with a timetable agreed with SEPA.
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## **How can I meet the requirements of this rule?**

The aim of the rule is to ensure that housing systems are designed and managed to minimise emissions, particularly of ammonia and odour. The following are the appropriate measures that you should take to comply with the condition.

From the date of permit, any new housing should be designed in accordance with these rules. Other techniques are not excluded, but you will need to demonstrate that they qualify as BAT. Examples of housing designs which meet BAT are available from the Reference Document on Best Available Techniques (BAT) for Intensive Rearing of Poultry and Pigs, commonly referred to as the BREF, published in July 2003 by the European IPPC Bureau.

It is recognised that certain techniques common in Scotland have not necessarily been reflected in the BREF in proposing these techniques for new buildings operators will be expected to demonstrate the represent the best techniques available to them for minimising pollution of the environment.

Proposals for reducing emissions to the environment from the housing should consider how the standards given above could met. Where you will not be able to meet these standards explain why your proposals represent the best techniques available to you on your site. If you fail to implement the improvements identified SEPA may vary the conditions of your permit to require upgrade within a specified time.

### **Measures for Housing Design**

- All buildings and associated infrastructure i.e. feed storage bins, should be specifically designed to accommodate the required feeding regime.
- Drinkers and troughs should be designed and operated to prevent leakage.

### **Specific Design Measures for Pigs**

- Slat design and slurry channels should comprise:
  - slats which facilitate maximum transfer of dung and urine to the transfer channels;
  - channels which transfer slurry to storage facilities (and not store slurry).
- Slurry systems for sows should comprise either:
  - a partly-slatted floor with a reduced area manure pit; or
  - a fully or partly-slatted floor with vacuum system for frequent slurry removal.
- Slurry systems for farrowing sows including piglets should comprise a part or fully- slatted floor with:
  - a combination of water and manure channel; or
  - a flushing system with manure gutters; or
  - a manure pan underneath.
  - farrowing pens should provide a slurry channel at the rear of the sow, away from the feeding area.
- Slurry systems for weaners should comprise a pen:
  - or flatdeck with a fully-slatted or partly-slatted floor with a vacuum system for frequent slurry removal;
  - or flatdeck with a fully-slatted floor beneath which there is a concrete sloped floor to separate faeces or urine; or
  - with a partly-slatted floor (two climate system); or

- with a partly-slatted floor and a sloped or convex solid floor; or
- with a partly-slatted floor and a shallow manure pit and channel for spoiled drinking water; or
- with a partly-slatted floor with triangular slats and a manure channel with sloped side walls.
- Slurry systems for growers/finishers should comprise:
  - a fully-slatted floor with vacuum system for frequent removal; or
  - a partly-slatted floor with a reduced manure pit, including slanted walls and a vacuum system; or
  - a partly-slatted floor with a central convex solid floor at the front of the pen, a manure gutter with slanted sidewalls and sloped manure pit.
- Solid floor systems should comprise:
  - scraped areas that prevent ponding or build up of urine.
  - dung passages and bedded areas sloped to drain urine and prevent ponding

### **Specific Design Measures for Poultry**

- Housing should;
  - have a damp-proof course;
  - be insulated to a minimum U-value of 0.4 W/m<sup>2</sup>/°C; (for turkeys, insulation is not required where housing has open sides).
- Caged systems shall be designed with either:
  - deep pit with ventilated manure store; or
  - manure removal, at least twice a week, by way of manure belts to covered storage; or
  - vertical tiered cages with manure belt with forced air drying, where the manure is removed at least once a week to a covered storage;
  - vertical tiered cages with manure belt with whisk forced air drying where manure is removed at least once a week to a covered storage; or
  - vertical tiered cages with manure belt with improved forced air drying where the manure is removed from the house at least once a week to covered storage; or
  - vertical tiered cages with manure belt with drying tunnel over cages, after 24-36 hours, the manure is removed to covered storage; or
  - other techniques that provide equivalent or better emission minimisation.
- Barn and free-range systems shall be designed with either:
  - litter system with forced air drying
  - litter system with perforated floor and forced air drying
  - an aviary system with or without range and/or outside scratching area
  - other techniques that provide equivalent or better emission minimisation.
- Broiler, broiler breeders, replacement pullet and turkey systems shall be designed with:
  - a naturally ventilated house with a fully littered floor and equipped with non-leaking drinking systems; or
  - a fan ventilated house with a fully littered floor and equipped with non-leaking drinking systems; or
  - other techniques that provide equivalent or better emission minimisation.
  - open turkey houses should be aligned at right angles to the prevailing wind direction and located to ensure exposure to natural airflow.
- Duck systems shall be designed with:
  - an unrestricted naturally ventilated house or a well-insulated fan ventilated house with either a:
    - partly-slatted floor with impermeable drainage channels and effluent storage area; or
    - a fully-slatted floor with impermeable drainage channels and effluent storage area; or
    - a fully-littered floor with a water system positioned above a gully and covered drainage channels and effluent storage areas; or
  - other techniques that provide equivalent or better emission minimisation

### **Specific Management Measures for Pig Housing**

- General management
  - Floors and walls should be kept clean. Keeping the pigs clean will help keep walls clean.
  - Cracks and damaged areas of walls should be repaired.
- Slatted or Partially slatted systems
  - The area under slats should be cleared of slurry when appropriate.
  - Lying areas should be kept clean through high standards of management and effective control of environmental conditions.
  - Floor space allowances, including partly-slatted floor space allowances, should be calculated to match to the pigs requirements, as either a surplus or shortage of space can result in dunging in the lying area.
  - Floors should be kept free from urine or slurry puddles through management to address puddles as they arise – scraping or washing down.
  - Water spray or dripper systems used for weaners/growers/finishers should be used over the slats to cool the pigs in hot weather and encourage good dunging behaviour. These systems should be maintained to prevent leakage or loss of water.
  - It should be noted that there are slurry additives on the market that claim to reduce emissions to air (ammonia, odour). The efficacy of some products has been found to be poor, and some may not be economically worthwhile.
- Solid floor systems – slurry/manure management and dunging behaviour
  - Dunging and lying areas should be clearly differentiated to ensure that the lying areas are kept clean and dry at all times.
  - Scraped areas should be operated to prevent ponding or build-up of urine.
  - Dunging areas should be cleaned out by scraping at least three times a week.
  - Deep straw systems, bedded areas and straw yards should have sufficient straw or other bedding material to keep the lying area clean and dry, and to bind nitrogen to reduce ammonia emissions.
  - Floors should be kept free from urine or slurry puddles, either through the provision of additional bedding material to soak it up, or management to address puddles as they arise – scraping or washing down.
- Temperature
  - The minimum temperature such that pigs do not need to huddle together should be maintained.
  - Where artificial heating is provided, controls should be used to match heating needs to ventilation needs so that heat is not wasted by being drawn out of the building.
  - Weaner accommodation in 'umbrella buildings' should be provided with sufficient ventilation to keep manure temperatures low.
- Ventilation
  - Draughts should be avoided in lying areas.
  - Dunging areas in naturally ventilated buildings should be sited beneath air inlets.
  - Lying areas should be sited under baffled inlets in low-pressure fan ventilated buildings.
  - The target rates for different weather conditions should be calculated in conjunction with your equipment supplier or pig adviser.

### **Specific Measures for Managing Poultry Housing**

- General management
  - Floors and walls should be kept clean.
  - Cracks and damaged areas of floors and walls should be repaired.
  - For free-range hens the areas around pop-holes should be protected to prevent rain from entering housing. The ground around pop-holes should be managed to prevent capping or erosion of the surface.

- Litter and manure
  - Litter should be kept loose and friable and its quality should be monitored, inspected to ensure it does not become excessively wet or dry. Any changes in quality should be investigated, and steps taken to rectify the problem.
  - Solutions may involve the addition of extra material or provision of heating to the problem area. Capping or wet litter should be avoided and may be due to birds drinking and excreting more as a result of illness, high temperatures, a feed problem or increased humidity.
  - The drinker system should be considered. The use of nipple drinkers with drip cups will minimise water spillage. Where drip cups are not used, or other drinkers are provided, water pressure should be checked frequently, and wet litter around drinkers should be addressed. Drinkers should be at the correct height and the height should be adjusted as the birds grow.
  - You should manage the floor of the house to minimise seepage of water either from the ground or entry of rainfall. An impermeable floor and damp-proof course will give the best protection. Where this is not present, a mixture of materials or thicker layers may address wet litter problems.
  - In layer housing using manure belts, increasing the frequency of belt cleaning will reduce emissions.
  - Removal of litter from the turkey house at intervals during the fattening period reduces the ammonia emissions, as the temperature of the litter and droppings does not increase.
  - Mixing of manure during the turkey fattening period gives maximum uptake of ammonia by sawdust/shavings/chopped straw.
- Temperature
  - Temperature should meet health and welfare needs for the age and number of birds.
  - Extremes of temperature should be avoided and draughts should be minimised.
  - Where artificial heating is provided, controls should be used to match heating needs to ventilation needs so that heat is not wasted, by being drawn out of the building.
  - Birds should not be subjected to conditions which cause either panting due to overheating or prolonged huddling and feather ruffling due to under-heating. Every effort should be made to avoid creating conditions that will lead to chilling, huddling and subsequent smothering.

Insulating housing will reduce energy consumption.

- Ventilation
  - Ventilation should match the health and welfare needs for the age and number of birds.
  - The target rates for different weather conditions should be calculated in conjunction with an equipment supplier or poultry adviser. Air speeds across the house should not be largely different from one area to another, and housing should be free from draughts.
  - Ventilation rates and house conditions should at all times be adequate to provide sufficient fresh air for the birds. In particular, accumulations of ammonia, hydrogen sulphide, carbon dioxide, carbon monoxide and dust should be avoided.
  - In deep-pit layer housing, air currents should be maintained so that air is drawn over the manure to dry it. Rain should be prevented from entering the manure storage area.
  - Belt cleaning systems should be designed and operated to optimise air flow and to maximise drying on the belt.

### **Additional requirements for existing housing**

Whether structures or buildings are replaced or modified will be a decision for you in consultation with SEPA, depending on local needs for emission reduction. Research suggests that it may be more cost effective to replace buildings or structures. Any replacements should give equivalent emission reduction to those techniques outlined in the rules for new housing, and should be planned to fit the business cycle of the farm.

Changes to management should be planned to avoid negative effects on animal health and welfare. The review of the housing should take into account all the appropriate measures for design and management given in this section.

### **Animal Places and Movements**

You are also required to record animal movements on and off the farm. These records should be made available to SEPA for inspection and should be supplied on request. The information on animal movements is required to estimate the emissions of ammonia to air from the farm, in place of monitoring of emissions directly.

### **Where can I get further information?**

Examples of housing designs are available from the Reference Document on Best Available Techniques (BAT) for Intensive Rearing of Poultry and Pigs, commonly referred to as the BREF, published in July 2003 by the European IPPC Bureau. If required, the full document can be downloaded at <http://eippcb.jrc.es/pages/FActivities.htm>. As this text is taken from a European document all costs are stated in Euros.

The following documents give advice on the management of pigs:

- [Code of Recommendations for the Welfare of Livestock: Pigs](#), SERAD September 2004;
- Environmental factors in pig production. Description of potential emissions, causes, abatement and legislation. MLC May 1999;
- [‘Environmental Management for Healthy Pig Production’](#), MLC;
- EU Directive 91/630/EEC Pig Welfare Directive.

The following documents give advice on the management of poultry:

- [Poultry Litter Management](#), Defra PB1739;
- [Heat stress in poultry – solving the problem](#), Defra PB10543;
- [Code of Recommendations for the Welfare of Livestock: Laying hens](#) SERAD September 2004;
- [Code of Recommendations for the Welfare of Livestock: Turkeys](#), Defra;
- [Code of Recommendations for the Welfare of Livestock: Meat chickens and breeding chickens](#), Defra 2002 PB 7275;
- [Code of Recommendations for the Welfare of Livestock: Ducks](#), Defra.

## **2.12 Incident Prevention and Reporting**

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| <p>2.12.1 In the event of an incident the Operator shall immediately take all necessary measures to prevent, or where that is not practicable to reduce, emissions from the Permitted Installation and to limit the environmental consequences as a result of that incident. All necessary measures shall be taken immediately to limit the consequences for the environment of any emissions from the Permitted Installation and to prevent further possible incidents.</p> <p>2.12.2 Without prejudice to the requirements of condition 2.12.1, in the event of a breach of any condition of this Permit the operator shall immediately take the measures necessary to ensure that compliance is restored in the shortest possible time.</p> <p>2.12.3 Notwithstanding the requirements of Condition 2.12.1 and 2.12.2 where a breach of any condition of this Permit poses an immediate danger to human health, or threatens to cause an immediate significant adverse effect on the environment, the operator shall immediately suspend operation of the Permitted Installation or relevant part thereof until such time as it can be operated in compliance with this Permit.</p> <p>2.12.4 In the event of an incident, the Operator shall notify SEPA by telephone without delay.</p> |
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	This notification shall include as far as practicable the information specified in Condition 2.12.5.
2.12.5	<p>The Operator shall confirm any incident to SEPA in writing by first class post e-mail or fax within 14 days of the Incident. This confirmation shall include:</p> <ul style="list-style-type: none"> <li>• The time and duration of the Incident,</li> <li>• The receiving environmental medium or media where there has been any emission as a result of the incident,</li> <li>• An estimate of the quantity and composition of any emission,</li> <li>• The measures taken to prevent or minimise any emission or further emission,</li> <li>• An assessment of the cause of the incident,</li> <li>• Proposals for remediation (where appropriate); and</li> <li>• Proposals for preventing a repetition of the incident.</li> </ul>
2.12.6	Within 6 months of the date of the Permit the Operator shall prepare, implement and maintain an "Incident Prevention and Mitigation Plan". In particular, this plan shall include measures specifically designed to afford protection to ...
2.12.7	Following an incident and at least every 4 years the Operator shall review the "Incident Prevention and Mitigation Plan" required under condition 2.12.6. Each review of the plan shall be recorded and where the Operator makes any revisions to the plan these revisions shall be recorded.

### **How can I meet the requirements of this rule?**

SEPA expects you to have an Incident Prevention and Mitigation Plan (IPMP) and implement it if an incident occurs. SEPA will check the incident management plan as part of compliance assessment.

In this context an incident means the following situations:

- Where an accident occurs which has caused or may have the potential to cause pollution;
- Where any malfunction, breakdown or failure of plant or techniques is detected which has caused or may have the potential to cause pollution;
- A breach of any condition of the permit;
- Where any substance, vibration, heat or noise specified in any condition of this permit is detected in an emission from a source not authorised by a condition of this permit and/or in a quantity which may cause pollution;
- Where an emission of any pollutant not authorised to be released under any condition of this permit is detected;
- Where an emission of any substance, vibration, heat or noise is detected that has exceeded, or is likely to exceed, or has caused, or is likely to cause to be exceeded any limit on emissions specified in a condition of this permit.

All staff should be aware of the location and contents of the IPMP, and their responsibilities in the event of an incident.

To produce an IPMP you should identify:

- Events or failures which have the potential to cause adverse environmental impacts, including:
  - Areas where the spillage or leakage of liquids could cause pollution, such as slurry tank failure or when housing is cleaned out and there is potential for litter/manure/slurry/cleanout water to be spilt. The surfacing and drainage of the area around the housing needs to capture and prevent the spread of any such spillage.
- Vulnerable locations, such as areas where foodstuff is stored in close proximity to high levels of motorised traffic.
- The location of any diverter valves.
- The likelihood of incident occurrences and the potential environmental consequences;
- Actions to minimise the potential causes of incidents; and
- Actions to be taken to minimise the consequences should such incidents occur.
- Keep a site layout plan, showing details of all surface and foul drains in the site office, with a back-up copy elsewhere in case the office is inaccessible in an emergency.
- Include an inventory of raw materials inventory in the plan.

If an incident does occur that has the potential to cause, or does cause, an adverse environmental impact you must:

- immediately undertake any action required by the IPMP;
- undertake any other action required to minimise the environmental consequences;
- investigate the causes of the event and take action to prevent a recurrence; and
- report the incident to SEPA.

### **Review the IPMP**

Reviewing the plan after an accident or incident is an effective way of preventing particular problems from occurring again. The relevant measures identified in the review must be incorporated into the accident management plan and subsequently implemented.

### **Incident Record**

The PPC Regulations require the site of the installation to be returned to a satisfactory state following the completion of the PPC activity concerned. An important aspect of this requirement is for the Operator of the installation to keep a record of any incidents that may affect the state of the site so that where any remedial work is required it can be targeted in a cost effective manner.

If any incidents occur that may have caused pollution of the soil or groundwater from the installation then you must make a record of the incident / incidents. You must also keep a record of any investigation or remediation work that has been undertaken regarding such incidents.

SEPA will examine the records of incidents and investigations of incidents as part of its inspection, and it is important that these records are kept for the duration of the operation of the installation.

### **Where can I get further information?**

- [PPG 21](#) Pollution Prevention Guidelines – pollution incident response planning.

## **2.13 Protection of Soil and Groundwater**

- 2.13.1 Unless specified elsewhere in this Permit there shall be no emission of any Pollutants to groundwater or soil from the Permitted Installation.
- 2.13.2 At least every << >> years, the Operator shall carry out an assessment of all measures used to prevent emissions from the Permitted Installation to soil and groundwater. A written report of each assessment shall be recorded and reported to SEPA.
- 2.13.3 The Operator shall carry out monitoring of the groundwater as specified in table 2.1 the purpose of which shall be to identify groundwater contamination from any relevant hazardous substances likely to be found on the site. Each assessment shall be recorded and reported to SEPA. The first assessment shall be completed by << date>>.

Table 2.1 – groundwater monitoring requirements

Relevant hazardous substance	Location	Frequency
	Either include location or As specified in methodology required by 2.13.7	Minimum frequency for groundwater monitoring is once every 5 years

- 2.13.4 The Operator shall carry out monitoring of the soil as specified in table 2.2 associated with the Permitted Activities, the purpose of which shall be to identify soil contamination from any relevant hazardous substances likely to be found on the site. Each assessment shall be recorded and reported to SEPA. The first assessment shall be completed by << date>>.

Table 2.2 – soil monitoring requirements

Relevant hazardous substance	Location	Frequency
	Either include location or As specified in methodology required by 2.13.7	Minimum frequency for soil monitoring is once every 10 years

- 2.13.5 The operator shall submit a detailed methodology for the monitoring required by conditions 2.13.3 and 2.13.4 to SEPA at least 6 months in advance of carrying out the monitoring.

### **How can I meet the requirements of these rules?**

The PPC Regulations require that the site is returned to a satisfactory state following the completion of the PPC activity concerned. Incident recording is covered in 2.12, and this section covers prevention of contamination and when soil and groundwater monitoring is required.

The assessment of measures to prevent emissions to soil and groundwater should be incorporated into your management system (see 2.1). It should include assessment of the operation, maintenance and inspection of storage, containment and site drainage facilities as well as operational facilities such as footbaths and wheel washes.

Your report should include any improvement actions that you propose to take to prevent emissions to soil and groundwater.

Soil and groundwater monitoring is required where hazardous substances are used, produced or released at the site. Biocides, disinfectants and oils are examples of hazardous substances. Monitoring must be carried out by suitably competent and experienced contractors. Investigation design, logging and sampling techniques should be carried out in accordance with current codes of practice (eg BS:10175:2011) and must be fit for purpose.

Prior to undertaking monitoring you are required to submit a detailed methodology to SEPA. This is so that SEPA can assess whether the proposed monitoring is fit for purpose. The methodology should include the following:

- Number, location and depth of sampling points
- Type of investigation technique
- Monitoring well installation
- Sampling methodology
- What analytical testing is proposed
- Details of analytical methods and quality control

Unless you have specific expertise in this area of work you are advised to seek specialist advice. Your local advisory service will be able to provide further advice.

### **Where can I get further information?**

Technical Guidance Note 2: Content and Scope of Site Reports

Technical Guidance Note 42: Soil and Groundwater Monitoring Technical Guidance for PPC Part A Installations.

## 2.14 Records and Reporting

2.14.1 All records made in compliance with this permit shall be kept in a systematic manner.

**2.14.2 Unless otherwise specified in a condition of this permit, every record made in compliance with a condition of this permit shall be preserved for not less than five years from the date of its being made. Every such record shall be kept at the permitted installation for not less than one year from the date of its being made and thereafter preserved at a location, previously notified to SEPA in writing, if that location is not the permitted installation.**

2.14.3 All records shall be legible, and any amendment made to any record made in compliance with a condition of this permit shall be made in such a way as to leave the original entry clear and legible. The reason for each amendment shall be explained in the said record.

2.14.4 All records relevant to the operation or maintenance of the permitted Installation shall be kept at the permitted Installation for not less than one year from the end of the period to which they apply.

2.14.5 Where any condition of this permit requires information to be reported, a report shall be forwarded in writing in duplicate to SEPA at the address specified in the explanatory notes attached to this permit, by the date specified. All such reports shall include the permit number and the name of the operator.

2.14.6 All reports or notifications required by any condition of this permit shall be made to SEPA in the manner specified in that condition to the address specified in the explanatory notes attached to this permit by the date(s) or within the period or at the frequency specified.

### How can I meet the requirements of these rules?

Copies of all records, audits and plans should be made available to SEPA on request. Where the information forms part of a separate document, reference should be made to the whereabouts of this document.

If you change a document, this needs to be done so that the original and any subsequent amendments remain legible, or are capable of retrieval.

You will need to keep the required records for a minimum of 5 years, unless agreed otherwise with SEPA.

## 2.15 Closure, Aftercare and Decommissioning

2.15.1 Within 18 months from the date of issue of the permit the operator shall prepare and maintain a plan (the "Decommissioning Plan") for the decommissioning of the permitted installation. The decommissioning plan shall set out the steps to be taken by the operator after final cessation of the permitted activities.

2.15.2 The operator shall notify SEPA in writing of their intention to cease the permitted activities, or any part thereof, for any period exceeding 12 months, no later than 3 months prior to the proposed date of cessation.

2.15.3 The operator shall implement the decommissioning plan on final cessation of the

permitted activities or any part thereof.

2.15.4 The operator shall review, record and, where necessary, update the decommissioning plan where the operator plans to make a substantial change in the extent or nature of the permitted installation.

2.15.5 The operator shall notify SEPA of any amendment of or addition to the plan that the operator considers necessary. SEPA's agreement in writing must be obtained before such amendment or addition is made.

#### **How can I meet the requirements of these rules?**

You should prepare maintain and, when required, implement a site decommissioning plan and make this available to SEPA. This will be checked as part of compliance assessment.

The site decommissioning plan should demonstrate that there has been adequate consideration of how to decommission the unit that is returning it to an acceptable state that does not pose a threat to the environment. Things to consider when drafting the plan may include the removal of wastes, chemicals fuel or hazardous materials such as asbestos.

SEPA will not accept an application to surrender the permit unless it is demonstrated that there is no pollution risk and no further steps are required to return the site to a satisfactory state.

You need to maintain and review the site de-commissioning plan when you make a substantial change to your installation.

#### **Where can I get further information?**

Remedial Treatment for Contaminated Land, Volume II: Decommissioning, decontamination and demolition. CIRIA SP102, 1995

## **APPENDIX 1 - ENVIRONMENTAL IMPACTS OF INTENSIVE AGRICULTURE**

### **1 Emissions from pig and poultry farms**

Intensive livestock production can pose a risk to the environment through the release of ammonia nutrients and metals from manure/litter/slurry, effluent discharges, dust, odour and noise. These emissions can cause damage to ecosystems, acidification and eutrophication; they can contaminate soils, affect human health and reduce amenity.

### **2 Ammonia**

Ammonia is a gas that is directly emitted from livestock and from manure, litter and slurry. It can directly damage vegetation and it contributes to eutrophication and acidification of sensitive habitats. The UK is a signatory to a number of international drivers that aim to reduce atmospheric pollutants. In 2003 total ammonia emissions were 300kt with more than 80% of the total originating from agriculture. Recent research suggests that over 11% of the UK agricultural emissions of ammonia arise from pig farming and over 17% arise from poultry farming. A large proportion of this is emitted from animal housing.

For pigs, techniques to abate ammonia emissions will depend on the type of housing and the slurry or manure collection systems being used. For slurry based systems the techniques primarily aim to reduce the emitting surface of the slurry, and to reduce the area of flooring which is damp, or where dung and urine can mix above slats. For manure based systems, generous use of straw will bind nitrogen and reduce the release of ammonia.

In poultry housing, the largest influence on emissions of ammonia is the nature of the litter. If the dry matter content of the manure is > 60%, ammonia emissions are minimal thus techniques concentrate on preventing spillages of water and providing a drying mechanism. New buildings should be able to meet this criterion.

### **3 Nutrients in manure/litter/slurry**

Nutrient rich runoff from the storage, spillage or spreading of manures, litter and slurries is a potential source of pollution. Nutrients enter watercourses and leach to groundwater, contributing to nutrient enrichment and eutrophication. There will be conditions in your permit specifically designed to prevent runoff from animal wastes causing environmental problems. When applied to land in accordance with good practice such as the PEPFAA Code and in relation to crop requirements this material is not generally considered to be a waste. However failure to comply with the code may result in stringent requirements relating to the disposal of this material being applied.

### **4 Effluent discharges**

Surface and groundwater may be polluted by substances that can arise from your farm.

Dust vented from buildings is contaminated with ammonia and other substances and when it rains these can be washed into gutters and then into drainage systems. This can cause pollution if allowed to enter watercourses without treatment.

Yard areas can be a source of polluting effluents due to animal movements, transfers of feed and manures. Contaminants (organic matter, ammonia, particles, metals) arising from intensive livestock farms contribute to diffuse pollution and needs to be addressed. Wherever possible yard areas should be kept clean and runoff managed from dirty yards.

House cleaning can generate a polluting discharge containing manure and disinfectants. This wash water must be contained and must not be allowed to enter surface or groundwater. It should either be spread to land or disposed of off-site. N.B some biocides etc may require a groundwater licence for disposal to land please consult your local SEPA office if unsure.

## **5 Dust**

Dust originates from bedding, feed and the animals themselves. Dust can be a local issue for poultry farms, especially as the birds reach the end of the growing cycles. It may be a problem particularly for larger birds.

Dust can be a source of nuisance, odour and air pollution and may affect human health. Techniques to manage dust will vary from site to site.

## **6 Odour and noise**

Odour arises primarily from the presence of manure/slurry and the biological changes which take place as it decomposes, body odour of the livestock and as a result of cleaning and disinfection of sheds and from storing of manure or slurry in the open.

The odour associated with livestock housing tends to be related to ammonia but other components, such as hydrogen sulphide, may also contribute. High ammonia concentrations usually accompany high odour concentrations in broiler buildings where litter is in poor condition and is too wet. Many actions taken to minimise ammonia will also minimise odour.

Noise is generally a site-specific issue, particularly in relation to feed and livestock deliveries. The location of fans causing a nuisance may be more widespread. Pigs tend to generate more noise in anticipation of feeding. Good management, consideration of receptors and maintaining plant and equipment can prevent many noise problems.

## **7 Incidents**

SEPA is interested in those incidents with environmental consequences, rather than those relating to the health and safety. Accidents may result in polluting discharges affecting the environment. You will need to produce an "Incident Prevention and Mitigation Plan" which will outline appropriate actions designed to minimise the environmental impact of any polluting releases.

Oil is toxic to both plants and animals and it can devastate river life. Oil spilt on the ground can pollute groundwater. Oil may be lost from un-bunded storage facilities due to spillage, leakage or physical damage. Bunding an oil storage facility is an easy way of containing spilt oil.

Pesticides are often highly toxic to aquatic life. They should be stored within bunds and protected from fire and frost.

Foodstuffs are highly polluting if allowed to enter watercourses. They should be stored and managed so that any spillages are contained.

## **8 Resource use**

PPC aims to ensure that resources are used as efficiently as possible in order to reduce the use of natural resources and to reduce the amount of waste produced. Improving efficiency should also save you money. You will need to address the use of the following resources:

Energy - operating more efficiently by reducing the energy used will reduce emissions of carbon dioxide, a gas that contributes to global warming.

Water – water is essential on the farm but it is important to assess whether you are making the best use of this resource. By optimising water use you will also be reducing the amount of waste water that you will have to dispose of.

Raw materials – (including biocides, pesticides, veterinary medicines, agricultural fuel oils and bedding) the inappropriate storage and use of such raw materials can lead to environmental pollution. You should aim to use materials that have a reduced environmental impact.

Feed – the feed that animals receive is obviously linked to what is excreted in manure/litter/slurry. A diet rich in protein, and therefore nitrogen, will result in excess nitrogen being excreted. Protein feeds are often more expensive and optimum use will be more cost effective. PPC aims to optimise protein use in feed so that nitrogen excretion is minimised. This is achieved by feeding a diet with reducing protein content over the production cycle.



## APPENDIX 2 – PERMIT APPLICATION GUIDANCE

This section is intended to provide further information for operators preparing an application for a PPC permit. The structure of this appendix follows that of SEPA's intensive agriculture application form and should be read in conjunction with that document.

Before an installation falls under PPC there is a requirement for you to be rearing poultry or pigs intensively in an installation with more than –

40,000 places for poultry;  
2,000 places for production pigs (over 30 kilogrammes); or  
750 places for sows.

In this context:

**Poultry** has the same meaning as in point 1 of Article 2 of Council Directive 2009.158/EC 'Poultry means fowl, turkeys, guinea fowl, ducks, geese, quails, pigeons, pheasants, partridges and ratites reared or kept in captivity for breeding, the production of meat or eggs for consumption, or for re-stocking supplies of game.

**Production pigs** are pigs, male or female, grown from a weight of 30 kilogrammes to the point of sale for either breeding stock or slaughter.

**Sows:** includes "gilts" and "sows". "Gilts" are female pigs intended for use as breeding stock, after they have left the production herd but before their first litter. A "sow" is a female pig used for breeding, which has had at least one litter.

**Intensively:** This activity description does not apply to the rearing of animals in extensive systems featuring large numbers of small housings.

**Places** - SEPA's view is that 'places' or 'design capacity' should be assessed on the maximum possible number of animals that can be housed given physical and legal (as distinct from contractual) restrictions and not the actual numbers present on the installation.

**Stocking Density** - Installations, such as those that have laying hens in battery cages, may make provision for a number of animals to be kept in separate small groups, in which case the number of places is a matter of arithmetic. Alternatively, the housing may consist of open plan buildings which could accommodate a variable number of animals. In such cases the number of places would, in the first instance, be determined by the maximum legal stocking density for the livestock in question. When calculating the number of places, SEPA will have regard to the Welfare of Farmed Animals (Scotland) Regulations 2000 (as amended) and the relevant code of recommendations for the welfare of livestock issued by the Scottish Executive under Section 3 of the Agriculture (Miscellaneous Provisions) Act 1968.

**Other restrictions** - In addition to the above, SEPA accepts the principle that there may be other physical or legal factors limiting the number of animals that may be held in any given accommodation. These may include the physical capacity of feeding or watering stations coupled with the requirement to comply with health and welfare standards. In such a case, the operator would need to demonstrate to SEPA that these factors would prevent the facility from being operated at the welfare code stocking density. Undertakings alone will not be satisfactory. In such cases the relevant equipment will need to be satisfactorily decommissioned so that places could not easily be reinstated.

**Contractual Arrangements and Assurance Schemes** - Operators should be aware that restrictions placed on activities, either by the contract they currently supply or the assurance scheme they are currently working to, will not generally be accepted as a legal restriction as loss of that contract may immediately put them in breach of the regulations.

Operators should bear in mind that the regulations will, in practice, apply to existing sites after 31 January 2007 and should base their assessment on activity they wish to undertake after this date.

SEPA encourages the industry to bring particular issues to its attention for consideration. Decisions made on a particular limitation will be on a site specific basis but will create a precedent when dealing with the industry as a whole. SEPA stresses that operators should, in the first instance, calculate the number of places they have available based on floor space and stocking density.

**Places for Production Pigs** - The Welfare of Farmed Animals (Scotland) Amendment Regulations 2003 (S.S.I. 2003 No. 488), Schedule 6, Part VI, Paragraph 52 gives maximum stocking densities for production pigs. This stocking density given varies depending on the weight of the animal. SEPA will expect these figures to form the basis of assessment of the number of places in any given installation. Where an operator can demonstrate that this is not the legal standard applicable to the system they employ they should contact SEPA to discuss.

Kg (live weight)	m2	Floor space needed for 2000 Pigs
30-50	0.40	800 m2
50-85	0.55	1100 m2
85-110	0.65	1399 m2
over 110	1.00	2000 m2

Notwithstanding the above, SEPA has received advice that the above stocking densities are inappropriate in a practical sense for rearing pigs on deep straw systems. SEPA is not aware of any legal standards applied specifically to this rearing method and would therefore expect operators to assess the number of places against industry best practice, as provided below. The weights shown are discrete points on a rising scale; please extrapolate between points given for the weights not shown.

Kg (live weight)	m2 per animal	Floor space needed for 2000 Pigs
30	0.50	750 m2
40	0.63	1260 m2
60	0.88	1760 m2
80	1.13	2260 m2
100 or greater	1.25	2500 m2

**Choice of appropriate stocking density** - SEPA will expect operators to judge the number of places available based on the weight of animals leaving the housing. Where animals consistently leave the housing at a specific weight e.g. over 110kg then assessment of places on a density of one animal per 1.0 m2 (1.25m2 for deep straw). If however, animals consistently leave the housing at 90kg then the assessment should be made on a stocking density of 0.65m2 per animal (1.19 for deep straw). Operators should be aware that in the context of this guidance, "weight of animals" is a reference to the average weight of a particular batch from individual housing and not the weight of individual animals.

Where the weight of animals leaving the shed is likely to vary between rotations, operators must base their assessment of places on the highest stocking density applicable to any final weight they may work toward. E.g. In a situation where a producer normally finishes heavy pigs in excess of 110kg in a particular housing but occasionally, however infrequent, produces consignments of bacon pigs at 105kg in that same accommodation then the calculation of the number of places for that particular housing must be based on the higher density applicable to the lower weight i.e. one animal per 0.65m2 (1.25m2 in deep straw courts).

Similarly, in a breeder-feeder scenario or other flexible system where animals are removed from accommodation before reaching finished weight, pig places should be assessed according to the lowest weight at which animals will be removed from the housing as part of the production process. i.e. if the operator is ever (however infrequently) going to remove animals from a housing below the weight of 50 kg then they should assess places against the 0.40m<sup>2</sup> stocking density (0.755m<sup>2</sup> for straw courts). If however animals are always in excess of 50 kg then a density of one place per 0.55 animal should be used (>0.755m<sup>2</sup> for straw courts).

The above is not intended to cater for extraordinary situations where one-off unplanned movements of stock have to be made in response to an emergency or other unforeseen circumstance. These scenarios should not be considered as part of the assessment process. Removal of animals from housing at a lower weight than which was originally intended in response to exceptional circumstances should not effect SEPA's assessment of the number of places on the site. SEPA will assess what constitutes exceptional circumstances on a case by case basis. Similarly consideration of weight should be on an average for any given batch rather than the weight of an individual animal.

**Auditing** - In the circumstance that live weights are unavailable, dead weight may be used instead. SEPA has been advised that dead weight is commonly 25% lower and will accept calculations based on an extrapolated live weight where actual live weight figures are unavailable.

**Aggregation of Places** - The disperse nature of intensive agricultural operations poses particular problems when assessing which operators will be subject to PPC. Paragraph 9(2) of part 2 of Schedule 1 to the Regulations allows for aggregation of capacity (in this instance capacity is determined with reference to places) where the same operator carries out the same 'activity' on the same site.

An example of this may be where two intensive poultry rearing houses, each with a capacity of 30,000 places where operated on the same site by the same operator, the aggregate capacity would be 60,000 places and the relevant threshold of 40,000 places would be exceeded. The two units would be regarded as one installation and a permit would be required for the operator to continue to operate. Only where the three separate tests of operator, activity and site are met would it be appropriate to aggregate capacity within separate housing units.

**Operator** - The operator is the legal person (for example an individual, a partnership or a company) that has control over the operation of the installation. The PPC Practical Guide (Part A activities) states that the operator must demonstrably have the authority and ability to ensure compliance with the permit. In determining the operator, SEPA will take into account factors including whether the operator/ proposed operator has the authority and control over day-to-day plant operation including:

- the manner and rate of operation;
- hiring and dismissing of key staff;
- making relevant investment decisions; and
- ensuring that operations are shut down in an emergency.

It should be noted that an applicant might be regarded as being in control of the installation even if he does not meet all these criteria. In addition, SEPA may take into account factors that are not included in this list. It should also be noted that the legal person who owns the installation or the land on which the Installation is situated would not necessarily be the Operator.

**Activity** - In the context of intensive agriculture there are only three different activities: one relating to poultry and two activities relating to pigs (see above).

**Same Site** - There is no definition of the term “same site” within the PPC regulations. When determining what constitutes the same site for an intensive agricultural installation, SEPA will take into account all circumstances including:

- natural clusters;
- technical connections between houses;
- management of the operation;
- permanent/historical agricultural holding;
- biosecurity restrictions;
- independent services.

It is also recognised that the concept of “same site” involves an element of proximity, and, as a starting point for the application of the aggregation rule, houses that are within approximately 500m of each other and subject to the above circumstances (see below) are likely to be regarded as being on the same site.

**Directly Associated Activities (DAA)** - An activity is considered to be a directly associated activity of the animal housing if:

- the activity serves the animal housing;
- it is “technically connected” to the animal housing;
- it is capable of having an effect on emissions;
- it is located on the same site as the animal housing (see above for the definition of same site).

Examples are likely to include:

- areas associated with the storage and handling of food, raw materials, wastes;
- equipment used for energy generation;
- areas or equipment used to collect and treat effluent or runoff from the installation.

Links such as pipes and conveyor belts between a listed activity and a DAA will generally meet the ‘technical connection’ criterion e.g. a pipe to a slurry lagoon/tank that serves the animal housing. However the connection need not be fixed and operations connected by other means such as wheeled transport may also be considered as technically connected.

The following activities will not be regarded as DAAs:

- land spreading outwith the installation boundary;
- the transport of manure from the installation to fields using a tractor and trailer;
- the transport from the installation through permanent or temporary pipework of slurry or dirty water used for irrigation;
- the provision of office and toilet facilities.

## APPENDIX 3 - PREPARATION OF A SITE REPORT

### Why is a site report and baseline report required?

A general principle of the Pollution Prevention and Control (Scotland) Regulations 2012 is that you should not pollute the ground on which your installation is located ("the site"). Where contamination does take place, an operator may be required to clean up the site before being allowed to surrender his PPC permit. To determine whether any contamination has taken place during the lifetime of the permit, it is necessary to carry out an examination of the site prior to the permit being issued. This will form the benchmark against which SEPA will judge the effect your operation may have had.

The initial site report (provided with your application) provides a factual statement of the condition of the site at the time of application for a permit to operate under PPC. In particular it describes the nature and distribution of potentially polluting substances in the ground and groundwater under the site. The substances (pollutants) of interest are those which will be handled at the site under the PPC permit. This accurate description of the status of the site is commonly known as the "statement of site condition" and is the main output of the site report.

In most circumstances a baseline report will also be required. A baseline report is required for Installations which use, produce or release "hazardous substances". A baseline report provides actual soil and groundwater measurements from the site.

The final site report (which will need to be completed if you apply to surrender your permit) provides a factual statement of the condition of the site on cessation of PPC activities. The final site report submitted at the time of application to surrender the permit will identify any change in site condition since the initial site condition report produced as part of your application. At surrender, SEPA is required to consider whether there is any pollution risk arising from the operations under the PPC permit, whether the site has been returned to a satisfactory state and whether all steps have been taken to remove, control, contain or reduce any hazardous substances in soil and groundwater. If you **cannot** demonstrate at permit surrender that the site is in a satisfactory state, then SEPA may require you to remediate to avoid any pollution risk. SEPA can only accept surrender once this is complete and is satisfied that the site has been returned to a satisfactory state and all steps to deal with soil and groundwater contamination have been taken.

### What constitutes the site?

The site includes all of the land where the activities of the installation are carried out. For example, this would include the animal housing, hard standing areas around the housing, access areas where vehicles manoeuvre, any holding tanks or swales, incineration, and feed or manure storage areas. It would not include fields on which manure litter or slurry are spread. The site plan required as part of the main application should clearly show the outline of the site and details of the activities being undertaken on the site.

### What aspects of the site should be examined?

Much of the site report can be undertaken as 'desk based' study using your own farming records, knowledge about the past history of the site and soil and groundwater maps, etc. (if readily available). It is also important to examine the site and identify any substances that may constitute a pollution risk and whether any hazardous substances are used at the site<sup>5</sup>. An example of potential risks might be the contamination of surface soils with fuel oil around the filling area of a diesel tank.

In addition to 'desk based' gathering of the above information, it is important to identify potential pollution pathways on the site by undertaking a thorough visual examination of the

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<sup>5</sup> Hazardous substances are substances or mixtures that come within the scope of the Chemicals (Hazard Information for Packaging and Supply) Regulations 2009 SI2009 No 716 and are substances that require Hazard labelling.

area. Wherever possible you should include photos in your application to help to demonstrate existing site conditions. Photographs of oil stores, fertiliser stores, manure heaps, etc. help to highlight potential causes of pollution from a site.

### **Adequacy of site reports**

The above procedure and the format of the site report provided in the example application documentation is intended to be adequate for sites that have historically been used for normal agricultural production and do not show signs of contamination. It is envisaged that the above approach should suffice for a majority of agricultural sites, but it must be borne in mind that such a simple methodology may not be appropriate for all sites. In particular a desk based report is unlikely to be adequate for the purposes of producing a baseline report (i.e. where soil and groundwater measurements of hazardous substances are required).

### **When is a more detailed study required?**

If for any reason the initial site investigations reveal that contamination could have occurred in the past or currently exists e.g. where the site of the farm was previously used as an industrial site or other potentially contaminating activity, a more detailed or intrusive site investigation may be desirable. In such circumstances, applicants are advised to concentrate on the areas of known/suspected pollution to establish the nature and level of contamination in defined zones on the site. In these circumstances it is probable that soil and water sampling at various locations on the site would be required. Site specific soil and groundwater measurements will almost always be required where hazardous substances are used, produced or released from the site. There are limited circumstances in which a baseline report may not be required, such as when there is no possibility of soil and groundwater contamination being caused. If you think this applies to your site you should discuss this further with SEPA. The rationale for any sampling strategy should be reported along with the results and a full interpretation of the results. Unless you have specific expertise in this area of work you are advised to seek specialist advice. Your local advisory service will be able to provide further advice.

SEPA has produced guidance for the production of more detailed site reports in its document [“PPC Technical Guidance Note 2: Content and Scope of Site Reports.”](#) If you are in any doubt as to the extent of your site report or require more guidance on its production you should contact your local SEPA office. A list of SEPA offices is provided on the SEPA website - [www.sepa.org.uk](http://www.sepa.org.uk).

### **Template Site Report**

The following table provides an outline of what SEPA is looking for in the site report. **Some of the information requested may already be required in other parts of your application. Please feel free to refer to the relevant sections rather than repeat the information.** When producing the site report, it should remember that you are trying to establish what contamination there may already be on your installation so that you are not held liable for cleaning it up when it comes to surrender your permit. Please be as accurate and concise as possible - quality of information not quantity. Finally, please remember that the information relates to the site of your installation not necessarily the whole farm. If in doubt please contact SEPA for advice.

Much of the information required for the site report can be presented in the form of annotated site plans, accompanied by brief notes and photographs, plus the 'Statement of Site Condition'. An example annotated site plan is shown as Figure 1.

Information Required	Where to get the Information/ Examples	Your Site (page/ section reference)
Stage 1: Information on Substances Used at the Installation		
1	<p>Storage, handling and use arrangements for all substances.</p> <p>This should include details on the substances stored, identify any hazardous substances (such as biocides and fuels) that are used, produced or released and in particular how they are moved and used. E.g:</p> <ul style="list-style-type: none"> <li>• 5000 litre red diesel – stored in an above ground tank, surrounded by cement lined bund. Diesel is delivered by road tanker (fill and dispensing points are outside the bund). The surrounding ground is compacted hard-core. The tank was new in 1995 and has been at this location since this time.</li> <li>• 5 x 200litre drums of biocide, stored in shed B, on concrete floor, with drip trays. ~10litres at a time added to bowser by hosepipe and used for cleaning animal shed floors.</li> <li>• 100,000litre open plastic slurry tank, installed in 2001. Surrounding area is concrete. Tank filled by direct underground pipe from pig shed, and emptied by above-ground flexible pipe to tanker (no secondary containment around discharge point but spills would run to yard drainage system which is connected back to slurry tank.</li> </ul>	
Stage 2: Assessment of site specific pollution potential		
2	<p>Identify the likely areas/points of emission.</p> <p>You should undertake a thorough visual examination of the site to establish if pollution may have occurred. Evidence of potential contamination may include:</p> <ul style="list-style-type: none"> <li>• run-off channels from hard standing areas where substances are stored, manure heaps, and visible contamination of vegetation;</li> <li>• evidence of ponding of liquids, wet land through a build up of liquid contamination, build up of dust or feed;</li> <li>• signs of leakage around septic tanks, (green vegetation, algae and slime in ditches);</li> <li>• darkened soils suggesting fuel or oil contamination, smell of fuel in soil;</li> <li>• lush green vegetation around sheds and in ditches, possibly from ammonia deposition;</li> <li>• evidence of 'scorching' on needles and leaves of trees very close to sheds. This can provide indication of excessive ammonia release from the farm;</li> </ul>	

Information Required		Where to get the Information/ Examples	Your Site (page/ section reference)
		<ul style="list-style-type: none"> <li>• build up of ash, bones and bare earth around incinerator sites;</li> <li>• areas of bare land with poor or little vegetative growth;</li> <li>• any other obvious signs suggesting potential contamination.</li> </ul>	
Stage 3: Site History			
3	Historic operations at the site	<p>It is important to remember that farms that have been operating for a number of years prior to applying for a PPC permit are likely to have used agricultural chemicals in the past and it is therefore likely that these will be present on the site and should be identified within the site report. Phosphates, ammonia, fertilisers, herbicides, pesticides etc could all be used at pig and poultry installations and may also have been used on green field sites prior to the introduction of the animal housing.</p> <p>Give full details about the historical use of the site, and any works done, for example during the construction of an existing installation. In most cases farm records should provide an adequate source of information but you may need to consult previous owners. E.g. the former locations of fuel tanks, chemical stores, burial pits, burning areas, machinery dumps. Include as much detail as possible on historic activities/ storage locations, e.g.:</p> <ul style="list-style-type: none"> <li>• The fuel tank was not bunded until 1987,</li> <li>• The manure heap and machinery dumps sat directly on the dirt,</li> <li>• All the old machinery was cleared in 1995,</li> <li>• The biocide drums have always been stored in the same shed, on concrete.</li> </ul>	
4	Known spills, accidents, pollution incidents	Provide details of any past pollution incidents that are known about, for example spillages of fuel oil, pesticides or other polluting substances. Give details of any historical incident that may exacerbate any existing contamination, or that could have resulted in additional pollution, flooding for example.	
5	Areas of historic contamination overlapping with potential future emission points	<p>You should look at the current layout of the site and operations, and compare it with the historical information. If there are areas where a past activity/ spill may be in a similar place to the current storage/ use, you should record this, either on a site plan, or written, e.g.:</p> <ul style="list-style-type: none"> <li>• When the old machinery dump was cleared in 1995, there was some diesel/ oil staining on the ground. This area is now under the current diesel tank bund.</li> <li>• The new slurry tank was built in the same place as the old manure heap.</li> </ul>	



Information Required		Where to get the Information/ Examples	Your Site (page/ section reference)
Stage 4: <b>Site</b> Environmental Setting (note this applies to the site of the installation – not necessarily the whole farm)			
6	Environmental setting of the site	This includes where it is, what size it is and a description of the main features of the area. The site map should clearly show the main structures and features on the site, e.g. drainage systems/ layout, swales or constructed wetlands, housing, hard standing areas surrounding the sheds, and areas where associated activities such as carcass incineration, feed storage areas, and swales or constructed wetlands associated with the farm. The site boundary should be indicated clearly. Fields surrounding the farm would not normally be part of the site for the purpose of the site report.	
7	Location of storage and use areas, and type of floor/ ground surface	The location of the storage areas and areas of use should be marked on a plan of the site. The floor/ ground surface should also be described, e.g. concrete, tarmac, hard-core, dirt.	
8	Geology	This information can provide an indication of how any pollution or contaminant can move around the site. This information can be gathered from excavations undertaken as part of building works, drainage or fencing works, as well as from the <a href="#">British Geological Survey</a> . You should include any information on current or old quarries and mines at or close to your site. This information is very useful to SEPA, but not essential if you do not have it.	
9	Soil type/ land use class	The “Land Use Class” and soil type will provide suitable information about the agricultural capability and geology of the site. Most farms will already have land use capability and soil type data, but if not maps are commercially available or you should contact your local farming advisory service. State if the site has received heavy applications of slurry, manure, litter or other organic waste in the past as this may have resulted in elevated levels of copper, zinc, and other metals in the soil.	
10	Surface water and groundwater information	You should provide details of watercourses, including field drains and ditches that exist on the site or are close by and may be affected by pollutants from the site. Also any groundwater abstraction boreholes, wells or springs. The location of these should be marked on your site plan. Groundwater information, such as the depth to the water table, its direction of flow and its quality is sometimes available, e.g. if you have an abstraction borehole, otherwise simple information such as the fact that any excavations always rapidly fill with water, low-lying areas that are always waterlogged or test bores which did not encounter groundwater, is very useful. Groundwater vulnerability maps describe the land in terms of its permeability. These maps are available for Scotland through your local advisory service.	

Information Required		Where to get the Information/ Examples	Your Site (page/ section reference)
Stage 5: Site Investigation			
11	Site investigations	You may have had a site investigation done at some point, either for PPC, or a pollution incident, or the construction of new buildings, drains etc. You should provide a summary of any investigations carried out, including the contractor, date, reason, the areas of the site covered, and the results of the investigation, including any chemical analysis. We will contact you later if we want to see the full report.	
12	Site Investigations (only required for hazardous substances)	<p>It is possible that any previous site investigation reports may provide sufficient information for the purposes of the baseline report. This may be the case where that information provides a sufficiently accurate and comprehensive description of the soil and groundwaters at the time of the site/baseline report.</p> <p>If pre-existing relevant information is not available, intrusive investigations will be required to provide soil and groundwater measurements for the site.</p>	
Stage 6: Statement of Site Condition			
12	Statement of site condition	<p>This statement should detail the current condition of the site. It should summarise, but be an accurate reflection of the findings of the desk based information and knowledge of the site.</p> <p>Depending on the size and layout of the site, it may be helpful to divide the area into different zones based on different activities on the site. The purpose of dividing the area into zones is to describe areas with similar characteristics in terms of pollution potential and ground conditions For example, areas containing animal housing, manure storage facilities (that are separate from housing) and areas for carcass incineration could be regarded as separate zones within the site. Zoning can be helpful on larger sites where there is a range of activities.</p>	

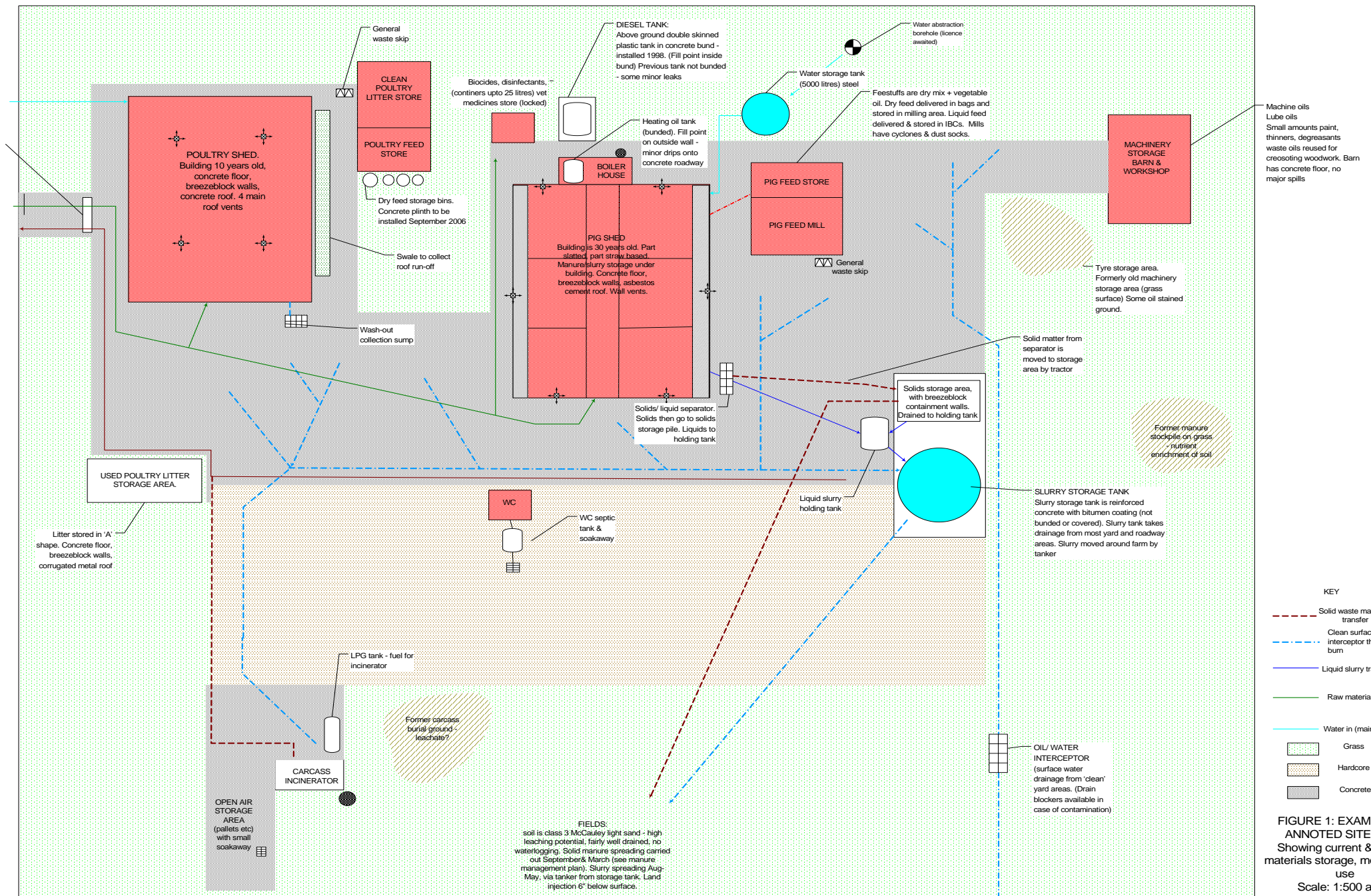


FIGURE 1: EXAMPLE ANNOTATED SITE PLAN Showing current & historical materials storage, movement & use Scale: 1:500 at 1:500

## **APPENDIX 4 – ODOUR MANAGEMENT PLANS**

### **Background**

The regulation of odour and other factors through PPC replaces 'statutory nuisance' on permitted installations, through permit conditions regulated by SEPA. As a result, responsibility for investigating complaints passes from the Local Authority (statutory nuisance) to SEPA once an installation has been permitted.

Aspects of odour management are integrated throughout the Standard Farming Installation Rules, but all sites will be required to prepare and maintain an odour management plan. The extent of this plan will be dependant on site specific circumstances with a very basic plan being acceptable where there is no history of complaint, a more extensive and detailed plan will be required where a specific problem has been identified. Please feel free to contact SEPA for advice on compliance with this or any other requirement of your permit.

### **Standards of odour control at PPC Installation**

In the case of odour, pollution is considered in terms of causing offence to the sense of smell, i.e. causing annoyance to people in the area, through exposure to offensive odour.

The point at which 'pollution' in the form of offence to the sense of smell is occurring, is taken to be the point at which there is an offensive odour outside the installation boundary as perceived by a SEPA officer.

New installations will be required to use Best Available Techniques (BAT) from the outset.

Existing installations will be allowed an appropriate timescale to upgrade techniques where meeting BAT will involve capital expenditure. Existing installations will be expected, however, to adopt good management practices from the date of being granted a permit. Any required changes in operation will be identified in the permit and set timescales for implementation.

## **Management of odour**

### **General aspects of odour management**

This guidance gives an overview of the principles of best practice for odour reduction and containment. Not all aspects will apply to all installations and some installations will have arrangements which are not described here. You will need to identify those elements which most closely match your circumstances and add in any other sources or problems.

The nature of intensive livestock operations means that preventing odour generation at source is rarely possible as animals are inherently odorous. However, there are many things that can be done, often at low cost, to minimise odour or to prevent it reaching neighbours.

In most cases, attention to housekeeping and good operational practices should be sufficient to achieve a significant reduction in the level of exposure experienced at sensitive receptors. In cases where all reasonable measures have failed to reduce emissions to an acceptable level, 'end of pipe' abatement solution may be considered. This may require odour to be contained at source and extracted to an abatement system with minimum fugitive losses. Biofilters or absorption 'scrubber' systems (chemical or biological) are often the favoured choice because of their effectiveness and ease of operation. This is a more expensive option so all efforts be made to improve the housekeeping aspects of the operation. Guidance on such systems is beyond the scope of this document.

### **Factors affecting the release of odour**

The level of odour emissions from intensive livestock installations is dependent on a number of factors, principally:

- size of operation;
- the type of building/ventilation;
- type of operation and the rearing cycle;

- the feeding regime;
- the way in which the operation is managed;
- storage arrangements for manure and slurry;
- land spreading practices.

The impact of those emissions on the local environment depends upon:

- proximity to local housing and other sensitive receptors, e.g. hospitals, schools;
- the nature of the local topography and prevalent weather conditions.

## **Aspects of odour management common to all operations**

### **Using location/siting as a means of odour control**

Care should be taken to site particularly odorous activities away from neighbours. Consideration of distance and wind direction i.e. ensuring that odour sources are not downwind of potential sensitive receptors will help in reducing the impact.

### **Landscaping (tree planting and earth banking) as an odour barrier**

Vegetation barriers (trees and hedges) and earth banks are sometimes said to provide a degree of odour control if planted between the source and local dwellings. However, there is no evidence that landscaping has any effect in dispersing the odour. The psychological effect of removing the odour source from view may have a much greater overall effect on the perception of odour rather than the actual odour reduction offered.

### **The use of odour masking/neutralising agents (air spraying)**

The use of additives to mask, counteract or neutralise odour are only generally suitable for short term operations, such as transfer of material or for addition to a particularly odorous batch of slurry. These products should not be regarded as a long term approach and, indeed, would not generally be cost effective in the long term. The smell of masking agents can often attract as many complaints as the smell they are trying to cover.

### **Selection and use of animal feed**

Consideration should be given on the selection and use of feeds at different stages in the rearing cycle in order to reduce nitrogen excretion. A high-protein diet increases the nitrogen and sulphur content of manure, contributing to emissions of ammonia to air and potentially other odorous compounds when the manure undergoes anaerobic degradation.

A number of different feed additives are available which claim to reduce odour from manure. In most cases these have not been proven sufficiently well for any to be recommended.

### **Feed delivery, milling and preparation**

Good housekeeping measures include:

- avoiding accumulation of waste feed;
- cleaning up spills;
- avoiding overflow and spillage from feed and drinking systems.

The addition of odorous by-products to feed such as whey and fish meal may increase the odour level of the feed (and accumulated spillages will smell more). Storage of these products may also lead to odour and dust generation.

Finely ground feeds and long feed drops onto floors should be avoided because they increase dust emissions. Odours may be absorbed onto particulate matter and then carried out of the building via the ventilation system.

Odours arising from storage of feed can be minimised by covering the storage containers or through the use of purpose built silos. Such storage areas should be protected from collision damage.

The delivery of the feed to storage areas, and from the storage container to the feeding station should be through a closed system to minimise the generation of dust.

Mixing and milling of dry foodstuffs should be carried out using closed systems or in an environment from which emissions can be minimised.

### **Disposal of carcasses**

Carcasses should be removed frequently to prevent odour-related annoyance and be covered using plastic bags or lidded bins where possible to prevent access by birds or rodents.

Animal By-Products legislation (The Animal By-Products (Scotland) Regulations 2003 (SSI2003/411)) specifies the requirements for carcass disposal including standards for incineration. This legislation is enforced by the State Veterinary Service and Local Authority

### **Ventilation and humidity**

Odour will be carried out of the houses with exhausted air. The exhaust rates tend to be highest when the outside temperature is high. This generally occurs in the summer months when the potential to cause odour annoyance is highest.

Ventilation rates should be optimised and checked. Insufficient ventilation capacity can lead to excessively high room temperatures which increase slurry/manure decay rates and hence odour emissions.

### **Atmospheric dispersion of odours**

Once odorous emissions leave the source they undergo dilution and dispersion in the atmosphere downwind of the installation. Where odours are released at height, they are likely to be more effectively dispersed than those released at a low level or, inadvertently, from open doors.

The design of ventilation systems is a specialist field however in general terms, roof (apex) vents produce better dispersion of odorous releases than those positioned along the side of buildings (side wall vents). Increasing the height of vent discharge points above roof level may give better dispersion. Ducting the ventilation flow to a single stack, which emits at a much higher level will provide still further improvement although may have the effect of making the odour detectable further away than was previously the case. Stack height calculation can be fairly complex and needs to consider a number of aspects relating to the emissions and the rate of emission, the temperature, the local topography and the location of receptors. It is best undertaken by a specialist.

The operator should ensure that dust deposits around the ventilation discharge points are cleared away on a regular basis to prevent excessive build-up.

### **Dirty water management to prevent stagnation**

Stagnant water can be a source of odour. The following measures can help to ensure that water contaminated by livestock excreta is disposed of quickly and unintentional areas where water could accumulate and stagnate are minimised:

- fit kerbs to concrete aprons to direct dirty water into collection tanks;
- enclose dirty water collection systems;
- empty and clean dirty water collection systems to avoid the development of anaerobic conditions in settled sludge;
- maintain drains and concrete areas;
- deal quickly with dirty water generated when buildings are cleaned out at the end of the cycle.

## **Odour management in pig rearing**

### **Odours from pig housing**

The principal sources of odour during rearing are slurry or manure and bedding material. The way in which the slurry or manure is collected in the pig houses, i.e. under floor and/or on the floor, the amount, the temperature and residence time will affect the amount of odour generated. Odour emissions from the housing can be minimised by keeping the pig pens

clean, i.e. by continually removing the slurry and regular removal of soiled straw or manure by flushing or scraping.

### **Minimising odour arising from animals and their housing**

In general terms:

- odour emission rate increases with an increase in slatted floor area;
- ventilating the pit increases odour emissions substantially.

Techniques to abate emissions will depend on the type of housing and slurry or manure collection systems in place. For slurry based systems, techniques are aimed largely at reducing the surface area of the slurry, and to reduce the area of flooring which is damp. For manure based systems, which may be releasing odour, increasing the available straw will bind nitrogen and prevent ammonia and odour escaping.

Anaerobic breakdown (in the absence of oxygen), unless deliberately induced as a method of treating slurry, is highly odorous and should be prevented by avoiding stagnation of wastes.

### **General hygiene**

It is important to maintain a good standard of general cleanliness for odour control. Any surface which is covered with manure will act as a source of odour. Therefore, reducing the exposed surface will reduce the overall odour emission. Exposed surfaces include the animals themselves, as well as pens and flooring, in addition to areas around the buildings.

Dirty pens can be caused by a number of factors, for example:

- poor management and building design;
- poor ventilation design and inadequate ventilation capacity;
- wrong pen shape;
- poor floor surfaces;
- incorrect construction of pen divisions;
- badly sited feeding and watering facilities;
- overstocking or under-stocking;
- poor differentiation between feeding, lying and dunging areas in pens.

Some of these are design issues and should be addressed when planning new facilities or extending or replacing existing houses. However, a lot can be done to minimise odour emissions by **keeping the pig pens clean**.

### **Slurry Systems**

- removing slurry and manure to a suitable store as frequently as possible;
- thorough cleaning and disinfection of pens once vacated;
- cleaning slurry and drainage channels to clear deposits, which encourage microbial growth;
- cleaning surfaces and ventilation shafts/cowls of dust deposits;
- maintaining drinkers and troughs to prevent leakage.

### **Solid Floor Systems**

- providing drainage to avoid the accumulation of effluent in areas where it may collect and start to degrade in an anaerobic manner. The drained liquid should be collected in a closed tank;
- repairing damaged concrete and drains to prevent ponding inside buildings;
- using sufficient bedding material to absorb excreta and keep animals clean;
- maintaining drinkers and troughs to prevent leakage;
- storing of bedding material in a dry area.

## **Flooring**

Floor design may be the most important measure which can be taken to reduce the odour emissions from slurry based pig buildings (Reference 1), e.g. use of part-slatted rather than fully-slatted flooring. Housekeeping will also play a part in ensuring a good standard of hygiene, in addition to the floor design:

- slats, pens and other surfaces should be cleaned at the end of the batch. High pressure hoses provide an effective means of removing accumulated deposits;
- scraped areas should be maintained to prevent ponding or building up of urine;
- slurry and manure should be flushed away or removed regularly as the under-floor storage of large amounts of slurry over a prolonged time is a major source of odour;
- damaged flooring should be repaired as soon as possible.

## **Odour management in poultry rearing**

### **Odours from poultry housing**

Odours from poultry sheds come from a number of sources. They are mainly caused by the breakdown of droppings and litter. Other sources of odour are from animal feed and waste food spilt onto floors. The following factors contribute to the emission of odours from poultry sheds:

- build-up of slurry or manure on concrete around buildings;
- removal and disposal of dead animals;
- drain maintenance;
- bedding cleanliness;
- management of drinking systems, with particular emphasis on frequently adjusting nipple and drip cups to bird eye level to avoid spillage and wet litter;
- stocking density;
- litter moisture content;
- insulation of the buildings and the long term maintenance of that insulation;
- ventilation and heating system;
- type of heating;
- composition of the feed, particularly its oil and fat content and its protein content.

The housekeeping practices at a well-run poultry operation should take these factors into account as part of their day to day management/operation of an installation.

### **Minimising odour arising from animals and their housing**

The odour associated with livestock housing tends to be related to ammonia although hydrogen sulphide can also be present. High ammonia concentrations usually accompany high odour concentrations in broiler buildings where litter is in poor condition (too wet). However ammonia should only be seen as a component of the overall odour. Many of the actions taken to minimise odour will also minimise ammonia.

Odour from litter and manure based systems may be minimised by increasing the dry matter content of the litter or manure, by, preventing spillages of water and providing a drying mechanism. If the dry matter content of the litter is 60% or above, ammonia emissions are minimal. New buildings should be able to meet this criterion.

In egg production, a belt manure removal system (ideally with forced air drying) should be used to avoid the accumulation of manure from caged layers. Where manure falls directly into a deep pit, ventilation of the pit should be provided to keep the manure dry.

### **Dust**

An important mechanism in the release to atmosphere of odour may be the presence and subsequent emission via the ventilation system of suspended dust particles originating from bedding, feed and the animals themselves. Odorous compounds may be adsorbed onto these particles. When the dust particles decompose releasing volatile compounds. Data



published by Van Geelen (Reference 2) suggests that removing the dust fraction from an odorous stream reduces the odour concentration by about 65%.

Dust emissions may be a problem particularly for installations rearing larger birds. Odours associated with dust releases can be minimised by:

- management of litter moisture content;
- ensuring dust deposits around ventilation discharge points are cleared on a regular basis to prevent excessive build up;
- collecting the water discharging from cleaning operations in sealed tanks.

### **Litter quality**

Litter quality is affected by:

- temperature and ventilation: in new houses ventilation should be designed to remove moisture;
- drinker type and management: this should be managed to ensure that all litter is kept dry i.e. moisture content is less than 40%. Systems should be checked for leaks and action taken as necessary. Nipple drinkers and drip cups (operate on demand) should be used in preference to bell drinkers (always full of water) and they should be sited at the correct height to minimise spillage;
- feeder type and management;
- litter material and depth: a depth maintained at 10-15 cm should be sufficient to absorb the moisture loading and to bind nitrogen and prevent ammonia escaping. Litter removed from the buildings at the end of the production cycle should be stored dry and away from residential areas;
- condensation;
- stocking density;
- feed formulation and quality;
- bird health: including prompt removal of dead animals.

## **Odour and manure management**

Odour arises primarily from the biological changes which take place as manure/slurry decomposes and from the body odour of the livestock. Strong odour also arises as a result of cleaning and disinfection of sheds - from the removal of accumulated manure and also from fumigants used. Storage of manure or slurry in the open is also a source of odour.

### **Slurry and manure handling**

Effort to reduce odour from slurry and manure handling and storage can have a substantial positive effect on the overall odour impact of the installation on local receptors. In particular, anaerobic conditions can lead to high concentrations of odorous substances within slurry which will be released during 'bubbling off' or when it is disturbed.

Roadways and other areas should be kept free of slurry or manure. Minimising the surface area of material exposed will reduce the odour emission.

Waste feeds (eg. milk and whey), silage effluent or dirty water should not be added to the slurry if there is a risk of causing odour problems either directly from the storage or handling of the slurry or its spreading. Wherever appropriate, silage effluent should be stored separately from slurry and manure. The storage of silage effluent and slurry in the same tank is not recommended for reasons of health and safety as this combination can increase the risk of the production of poisonous gases.

### **Slurry and manure storage**

Slurry and/or manure storage areas and any material separated from the slurry or any straw based manure should be sited as far away as possible from residential areas.

Covering or enclosing slurry storage tanks will stop or significantly reduce odour escaping to the atmosphere. The Standard Farming Installation Rules require that exposed surface areas

of slurry in stores should be covered to minimise emissions of odour and ammonia. New open slurry storage tanks will not be allowed and plans must be in hand to replace or cover existing open tanks. The options are to fit a rigid cover to a steel or concrete tank, or to use a floating cover of light expanded clay aggregate. Other covers, such as straw or peat will sink and do not reduce emissions effectively.

Fixed covers will reduce emissions, but the concentration of odour in the headspace can become very high. This may be released when the cover is removed, producing very strong odours at receptors if not dispersed adequately in the air. This may cause particular annoyance, even if short lived. There may also be health and safety implications if workers are exposed to the air in the tank headspace.

Floating covers have the advantage of no headspace but will only work effectively if disturbance to the surface is minimised. A floating cover of aggregate will not trap odorous digester gases produced during 'bubbling off' in settled solid in slurry stores. Some more permanent floating cover designs have an extraction system to remove gas.

Reducing the surface area will help to reduce odour emissions. Any form of agitation or turbulence from pumping or stirring will increase the odour from the surface of an open tank. Bottom filling will minimise surface emissions. Formation of a crust may provide a degree of protection against odour emissions but turbulence from stirring can break the crust. The frequency of stirring should be minimised

Odour minimisation is provided largely by keeping manure undercover. Long-term field storage should be avoided as adequate cover may not be possible.

Other treatment methods can be used to control odour emissions during storage. Additives are commercially available that claim to control odour emissions; the main types are:

- oxidising agents;
- deodorants which react with odorous compounds;
- odour masking agents;
- odour neutralising agents;
- biological agents – enzymes, bacteria;
- feed additives (Reference 7).

These additives vary in effectiveness and are generally not a long-term solution.

### **Treatment of slurries and manures**

There are various options for slurry treatment, including screening, separation, composting, aeration and anaerobic digestion. Their use would need to be considered on a case-by-case basis. In general:

- Separation of sludge by mechanical means, aeration or digestion can reduce the odour emitting potential.
- If an aerobic or anaerobic system is used to reduce the odour emission it should be large enough to handle all the slurry produced, and designed for this purpose. It should be operated according to the manufacturers instructions.
- When using aerobic treatment methods, odour reductions and overall control is better when solid content is reduced.
- Monitoring should be undertaken to ensure that the appropriate conditions are maintained, particularly in the case of aerobic digestion.
- The solid content of the slurry store should be reduced using a separation stage. With less solid material present the need for stirring is reduced.

The management of slurry can be improved by removing coarse solids (slurry separation). For example, for pig slurry comprising 2 to 4% dry matter, a simple wedge screen or vibrating screen can be used and the collected solids (8 to 12% dry matter) will self-drain if held in a suitable store. Separators that press, squeeze or screw the slurry against a fabric or perforated steel screen will produce a solid with a dry matter content ranging from 18 to 30%. If slurry is left in the collection pits for more than 3 to 5 days, degradation of material structure (becomes more fluid) can be expected making the separation process more difficult.

The solid portion can be stacked and stored in a similar way to farmyard manure. At higher dry matter levels the material will be suitable for composting. The separated liquid portion can therefore be pumped to store. Once separated, storing the liquid portion is easier because there is less risk of crust formation and solid settling. When solids are removed mixing in store only needs to be carried out occasionally which results in a reduction of odours released during storage.

If solids are not removed from the slurry, the organic loading within the slurry store (lagoon or tank) will become increasingly anaerobic. The presence of solid material provides an additional demand on available oxygen, thus increasing the amount of ammonia and hydrogen sulphide produced when the slurry is agitated.

Composting can significantly reduce the odour from manure. However, the composting process itself can be very odorous and care needs to be taken with the system design and management. The presence of oxygen is essential to the composting process and to prevent odorous anaerobic breakdown. A method of collecting any run-off from the store should be provided.

### **Slurry and manure spreading**

The spreading of manure and slurry in accordance with the Scottish Executive Code of Good Practice for the Prevention of Environmental Pollution from Agricultural Activity (PEPFAA code) is not regulated under PPC permits however; odours released from animal manure or slurry spreading activities are one of the most frequent sources of odour complaint. During spreading, odours can be detected up to 3km from the field (Reference 3).

## **Writing an odour management plan**

### **1. Identify the sources of odour and/or complaint on your installation**

Carry out an assessment 'walk around' to identify where odours are coming from. This type of assessment does not involve measuring or predicting emissions - instead it relies upon a subjective assessment of whether odour is present or not, and how strong it is.

Walk around the installation and think about where odours come from:

- How much does odour increase during occasional operations such as animal loading, shed cleaning and removal of waste? Are complaints related to these activities?
- Are there slurry pits or manure storage areas? Are these covered or uncovered? Where are they located in relation to local houses?
- Is slurry or manure spread on the farm?
- Are there deposits of slurry, manure or feed etc. on roadways or in yards?
- Are there uncovered skips or bins?

It may be useful to record the intensity and extent of the odour in order to help produce your plan. It is suggested that a scale of increasing odour intensity is used, such as:

- 1 No detectable odour.
- 2 Faint odour (barely detectable, need to stand still and inhale facing into the wind).
- 3 Moderate odour (odour easily detected while walking & breathing normally).
- 4 Strong odour (strong but bearable).
- 5 Very strong odour (very offensive, possibly causing nausea, particularly if not accustomed to this odour).

Spend at least 3 minutes at the point(s) nearest to housing and, if odour is detectable consider which of the following best describes the extent of the odour:

- 1 Local & transient (only detected on the installation or within the permitted installation boundary during brief periods when wind drops or blows).
- 2 Transient as above, but detected outside of the permitted installation boundary.
- 3 Persistent, but fairly localised.
- 4 Persistent and pervasive up to 50m outside the permitted installation boundary.
- 5 Persistent and widespread (odour detected >50 m from the permitted installation boundary).

The results (1-5 for intensity and 1-5 for extent) should be recorded against the time and date and the appropriate monitoring location. The name of the person undertaking the assessment should be recorded. The cloud cover, wind direction and wind speed should also be noted using the Beaufort scale in Table 1.

2. Look at the odour sources and corrective actions discussed in Section 2

Note those sources or activities which **do** cause a problem on your installation and the types of corrective actions that you will need to highlight in your odour management plan.

3. Transfer the relevant information into the odour management plan

- Identify each odour problem/source;
- Select the appropriate corrective action for each problem.

**You will be expected to follow the actions you have set out in the plan.**

If there are complaints and you can show that you have complied with these actions then the plan may need to be revised. It would be advisable to discuss this with SEPA. If you have not complied with the plan and complaints are received, then you may be liable to enforcement action.

**Example Odour management plans**

Required actions should be broken down into individual tasks as far as possible. It is often helpful to identify the individuals who will carry out each task (if relevant) and when this will be done. The plan should also include actions to be taken if something goes wrong which will increase odour emissions (such as a spillage) and seasonal variation in emissions.

An example of a basic odour management plan is shown below and may be used as a template for your farm-specific management plan. Consider both management and infrastructure in your plan.

Odour problem	Actions you will take to reduce the odour	Completion Date
Carcasses start to smell prior to collection	<ul style="list-style-type: none"> <li>• New arrangement made with the company that collects the carcasses. Collection now to be automatically made every two days unless we phone [person/number] to cancel a pick-up or to increase frequency.</li> </ul> <p>Place in bins to keep vermin away. Ensure lid is tightly closed.</p>	<p>June 2005</p> <p>July 2005</p>
Odour released from slurry collection trench	<ul style="list-style-type: none"> <li>• Cover and seal the trench.</li> <li>• Cover and seal the intermediate slurry pit</li> </ul>	<p>March 2006</p> <p>April 2006</p>

## Complaints procedure

A procedure should be established for verifying and responding to complaints about odour. The existence of a complaints procedure can help you to:

- improve relationships with neighbours;
- identify sources of odour and prevent future problems.

Prompt action in response to complaints, including a discussion with an explanation to the complainant, is very important and may stop issues escalating and further complaints being made. A quick and sympathetic response to complaints can often defuse a situation to the benefit of the complainant and the operator.

A suggested form for recording complaint details is given below.

The complaints record form should be tailored to the specific installation, location and neighbours, but most will have the following elements:

- 1) The form should be completed, signed and dated by a 'responsible person'.
- 2) The caller should be asked for their name, address and telephone number (They may not be willing to provide this information but this does not invalidate the complaint)
- 3) Each complaint should be given a reference number.
- 4) The caller should be asked to give details of:
  - the time the odour was detected;
  - how long it lasted;
  - how often it occurs;
  - the nature of the odour – what sort of odour was it? What did it smell like?
- 5) The 'responsible person' should then, if possible, make a note of :
  - the weather conditions at the time the odour was detected – usually wind direction and a note of the conditions (light wind, no wind, strong breeze, or use the Beaufort scale in Table 1 below, clear, full cloud cover etc.);
  - the activity on the installation at the time the odour was detected, particularly anything unusual.
- 6) The reason for the complaint should be investigated and a note of the findings added to the log – this need not be complicated but should be sufficient to identify any activity that may have led to the complaint.
- 7) The caller should then be contacted with an explanation. It often helps if you can show that you have taken some kind of action to minimise the odour in future.

**Table 1 Beaufort Scale**

Force	Description	Observation	km/hr
0	Calm	Smoke rises vertically	0
1	Light air	Direction of wind shown by smoke drift, but not wind vane	1-5
2	Light breeze	Wind felt on face; leaves rustle, ordinary vane moved by wind	6-11
3	Gentle breeze	Leaves and small twigs in constant motion	12-19
4	Moderate breeze	Raises dust and loose paper; small branches are moved	20-29
5	Fresh breeze	Small trees in leaf begin to sway, small branches are moved	30-39
6	Strong breeze	Large branches in motion; umbrellas used with difficulty	40-50
7	Near gale	Whole trees in motion; pressure felt when walking against wind	51-61

Following complaints it may be appropriate to review the odour management plan. The complaints record should be made available to SEPA upon request. An example of a form for recording a complaint is given in below

Odour Complaint Report Form			
Installation to which complaint relates:		Date recorded:	Reference number:
Name and address of caller:			
Tel no. of caller:			
Location of caller in relation to installation:			
Time and date of complaint:			
Date, time and duration of offending odour:			
Caller's description of odour, e.g. comparison with other odours, strong/weak, continuous, fluctuating:			
Has the caller any other comments about the offending odour?			
Weather conditions (e.g. dry, rain, fog, snow):			
Wind strength and direction (e.g. light, steady, strong, gusting) or use Beaufort scale (see Table 1):			
Any other previous complaints relating to this odour?			
Any other relevant information:			
Potential odour sources that could give rise to the complaint:			
Operating conditions at the time offending odour occurred – e.g. removing manure from housing, deliveries, feeding:			
<b>Follow-up</b> Date and time caller contacted:			
Action taken:			
Amendment requirement to Odour Management Plan:			
Form completed by:		Signed:	

## Full odour impact assessment

### Overview

This section describes the options for carrying out a full odour impact assessment. You may need to consult an odour expert in order to carry out an odour impact assessment. Any odour measurement or prediction reports should be produced by a competent contractor or survey team.

You will need to carry out a full odour impact assessment if:

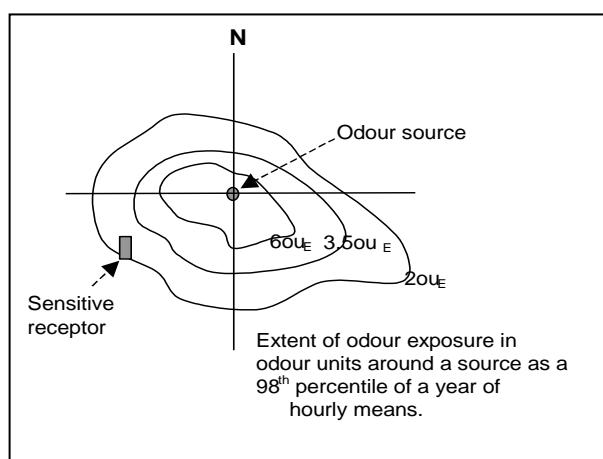
- applying for a permit for a new unit or a variation to the permit for an extension to an existing unit which may affect 'sensitive receptors'; or
- you have failed to control odour sufficiently using housekeeping measures and consequently, other steps are needed to reduce the odour emissions.

The closer the sensitive receptors are to the installation, the greater the likelihood that a full odour impact assessment will be needed. Additionally, in the case of extensions to existing installations, the complaint case histories may influence the need for an impact assessment.

It should be noted that an impact assessment carried out for planning purposes may not contain sufficient information for a PPC application. Confirm with SEPA whether all requirements are met.

There are two main steps in carrying out a full odour impact assessment:

- the odour emissions must first be measured or predicted;
- the emissions data is fed into a mathematical atmospheric dispersion model which calculates the spread of the odour around the source, taking into account the local weather patterns (modelling is described in Section 4.4).



**Figure 2 Odour contours around a source**

The model will draw a contour plot around the source (or proposed new installation), linking points of equal ground level concentration. Local houses and all other frequented areas, not including footpaths or public roads, will fall somewhere within a contour. The concentration at this point is compared to a benchmark level and it can be determined whether the concentration is acceptable or not. Emissions can be measured or predicted where measurement is not possible or the installation has not yet been built.

IPPC guidance Note H4: Part 2 (Reference 3) should be consulted for detail on sampling and assessment techniques.

### Additional points to note relating to pigs

Additional points to consider when reviewing an odour assessment report relating to pigs:

- Odour emissions will vary throughout the rearing cycle and as the age of stored slurry increases. Assessments made immediately after housing has been cleaned or the collection pit emptied should be avoided.
- Many of the odour sources on a pig operation are surface sources. The methodology used to determine the odour rate should be clearly defined.

- The results of an olfactometry exercise should be reported in their entirety rather than as a single averaged value.
- Where practical, the air flow rate should be measured (this may not be possible for all odour sources).

#### **Additional points to note relating to poultry**

Additional points to consider in reviewing an odour assessment report relating to poultry are:

- Odour emissions vary through the broiler rearing cycle and tend to rise towards the end. An assessment using data from a building housing broilers of less than 30 days is unlikely to correlate with the actual nuisance potential.
- Odour samples should be collected at a point of emission rather than from within the building.
- The results of an olfactometry exercise should be reported in their entirety rather than a single averaged value.
- The air flow rate must be measured and the number of fans in operation reported, as well as the total number possible.
- Although it is the single most important factor in controlling odour, the moisture content of litter cannot be used solely to predict the odour emission rate because several other factors may influence odour generation.

#### **Predicting emissions**

When it is not possible to measure emissions, perhaps because the impact assessment relates to a proposed installation, it is possible to predict emissions by using:

- measurements taken at a similar installation (similarity must be justified);
- emission factors where they are available.

Odour emission factors are numerical values which can provide a substitute for measuring emissions. They are based upon assessment by olfactometry of samples from vents etc. from a number of different livestock installations which give an odour emission rate per pig/bird. These figures, however, are based on limited data and can therefore be very imprecise. However figures can be useful in providing an approximation only of odour emissions which can then be modelled to show an estimate of the predicted impact. As the calculations are estimations only, it is good practice to compare any site specific odour emission measurements with either published values or 'blueprint' emissions.

#### **Use of odour emission factors**

Odour emission factors should be taken from published data. There are a number of sources for these factors, such as:

- *MAFF R&D Project WA0601 - UK, Reference 4;*
- *Sneath and Robertson – UK, Reference 9;*
- *Clarkson and Misselbrook – UK, Reference 10;*
- *Environmental Protection Agency – USA, Reference 11;*
- *Ognik and Lens – Netherlands, Reference 12.*

**Caution:** there can be considerable variation in the emission factors between farms and also on the same farm. It should be recognised that published figures may not reflect the increase in odour emission with increasing weight/age.

It is likely that new information and emission factor data will become available and the applicant should ensure that the latest and most suitable data is used for the assessment.

The emission factors used should be included in the assessment along with justification of their use and any related assumptions about the data.



## References

1. VDI 3940. Determination of Odorants in Ambient Air by Field Inspections. Verein Deutscher Ingenieure, Dusseldorf, Germany, 1993.
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3. Code of Good Agricultural Practice for the Protection of Air, Ministry of Agriculture, Fisheries and Food (now Defra), October 1998.
4. IPPC Guidance Note H4:Horizontal Odour Guidance Part 1 – Regulation and Permitting, Part 2 – Assessment and Control, Environment Agency, October 2002 (consultation document).
5. MAFF R&D Project WA0601. Measurement of odour and ammonia emissions from livestock buildings. S Peirson & R J Nicholson, ADAS, March 1995.
6. Sneath R.W. and Robertson A.P. Odours from Modern Poultry Production. <http://www.sri.bbsrc.ac.uk/science/eeg/odour/odourhome.htm>
7. Clarkson and Misselbrook 'Odour emissions from broiler chickens' in 'Odour and ammonia emissions from livestock farming' (Neilsen, Voorburg & L'Hermite eds.), Elsevier Applied Science, London. 1991.
8. Odour impacts and odour emission control measures for intensive agriculture. Environmental Protection Agency 2001, environmental research R&D report series No 14.
9. Geuremissie uit de veehouderij, Overzichtsrapportage 1996-1999, N.W.M. Ognik, P.N. Lens, Rapport 2001-14, September 2001.

## Other sources of information

1. Assessment of community response to odorous emissions – R&D Technical Report P4-095, undertaken for the Environment Agency by OdourNet UK Ltd, October 2002.
2. Determination of the Best Available Techniques for Control of Odour – R&D Technical Report P4-079, AEA Technology on behalf of the Environment Agency, October 2002.
3. Nimmermark, S. Odour influence on well-being and health with specific focus on animal production emissions. Review article, Ann Agric Environ Med 2004, 11, 163-173.

## APPENDIX 5 – NOISE MANAGEMENT PLANS

### Background

Aspects of noise management are integrated throughout the Standard Farming Installation Rules, but all sites will be required to prepare and maintain a noise management plan. The extent of this plan will be dependant on site specific circumstances with a very basic plan being acceptable where there is no history of complaint, a more extensive and detailed plan will be required where a specific problem has been identified. Please feel free to contact SEPA for advice on compliance with this or any other requirement of your permit.

The following guidance is specifically targeted at assisting in this process. More detailed guidance on the issue of noise control can be obtained from:

[http://www.sepa.org.uk/pdf/ppc/guidance/ppc\\_noise\\_guidance.pdf](http://www.sepa.org.uk/pdf/ppc/guidance/ppc_noise_guidance.pdf) (reference 1).

### What standards of noise control are we aiming for?

Noise pollution is considered in terms of causing environmental harm or offence to the sense of hearing, i.e. causing annoyance to people in the area through exposure to noise. However, the regulations do not relate to occupational exposure to noise – only to noise as an environmental pollutant, i.e. beyond the installation boundary.

The general approach taken by SEPA for PPC installations is to achieve ‘no reasonable cause for annoyance’ to persons beyond the boundary of the installation, as far as is possible using the Best Available Techniques (BAT). For many installations environmental noise will not be a significant issue but for others it will need to be considered carefully and controlled.

The legislation requires that the amount of time and money spent on taking measures to reduce noise should be in proportion to the annoyance caused or potential to cause annoyance. Good practice should be adhered to at all times by all installations, but if a large number of complaints are received, or the installation is close to a built-up area then more effort may be required to reduce noise. BAT covers management techniques (i.e. Best Practice), site design and layout as well as specific noise control measures such as barriers and silencers to control noise.

*Note: The PPC Regulations also treat vibration as a pollutant. If there is a vibration problem, specialist advice should be sought and discussions held with a SEPA Officer.*

### What is “no reasonable cause for annoyance”?

The amount of annoyance should not be assessed only by means of the number of complaints or complainants. All sensitive receptors are entitled to the same reasonable expectations of a satisfactory environmental noise climate. It should be remembered that it is not only the level of noise that can cause annoyance, but sometimes the source itself or the time of day or night that it occurs.

### Standards for new installations

**New** intensive livestock installations will be expected to use BAT from the outset.

The acceptability of noise from an installation will be influenced by the existing noise climate. As the Standard Farming Installation Rules state, the requirements and conditions for noise will be site-specific and it is, therefore, not possible to be prescriptive on acceptable numerical values. However, the British Standard BS 4142:1997 (Reference 6) may be appropriate to offer guidance on the likelihood of complaints arising.

## **Standards for existing installations**

Existing installations will be allowed an appropriate timescale to upgrade where meeting BAT involves capital expenditure, but will be expected to adopt good management practices from the date of permit issue. Any required changes in operation will be identified in an improvement plan set by SEPA. This improvement plan may require the operator to investigate alternative techniques, provide recommendations and set timescales for implementation.

## **What to include in a 'Noise Management Plan'**

When producing a noise management plan you must provide information on the:

- emissions of noise from the installation;
- techniques employed to control noise.

The level of detail supplied in the application should reflect the level of risk. The higher the risk of causing annoyance or other environmental impact, the more detail is required and the higher the expectation of a proactive approach to noise control.

Where the activities are inherently quiet and there is no history of noise nuisance, information requirements will be minimal.

### **Identify the sources of noise and/or complaint on your installation**

Carry out an assessment 'walk around' to identify where noises are coming from. This type of assessment does not involve measuring or predicting noise levels - instead it relies upon a subjective assessment of whether the noise is audible or not, how loud it sounds and if it has any noticeable characteristics. However, operators should be aware of the limitations of the subjective methodology given the relative nature of noise pollution.

This assessment can be carried out at specific points around the perimeter of the installation or close to the sensitive receptors, during a typical day, evening and night. There are two aspects of this assessment:

- Assess individual noisy events when they take place, such as deliveries, feeding time or manure scraping; and
- Assess longer, continuous noises such as fans, generators, etc. that run for prolonged periods. These long term noise sources should be assessed when they are likely to be more intrusive.

Unless the distance between source and receptor is more than a few hundred metres, the influence of the weather on noise levels is quite limited. The weather itself can affect the sound levels in an area by blowing in trees and hedges, possibly resulting in a false impression of the impact being formed. The assessment should therefore be undertaken when:

- busy roads nearby are dry since wet roads are noisier than dry roads;
- the weather is good i.e. no rain, fog, snow etc.;
- There are no temperature inversions (i.e. still conditions, often with mist forming in layers);
- The wind speed and direction are less than Force 2 of the Beaufort Scale (see Table 1 in Appendix 4).

Spend at least 3 to 5 minutes at the monitoring point(s) chosen and, if the noise is audible consider which of the following best describes the volume of the noise when localised or intermittent noise sources are quiet (e.g. no passing cars):

- Inaudible
- Barely audible
- Clearly audible
- Loud and intrusive

It should also be considered whether the installation has any characteristics that may be annoying, such as whines, bangs or clatters, and animals squealing. Careful thought must be given to this aspect since the nature of the noise may be disturbing, even though the volume may be quite low.

A description of the noise should be recorded, together with its intensity and characteristics. The date and the precise monitoring location as well as the name of the person undertaking the assessment should also be recorded.

## **Step 2. Describe the techniques used to control the noise**

### General Principles of Good Practice

This section gives an overview of some of the principles of good practice for noise reduction and control. Not all aspects will apply to all installations and some installations will have arrangements, which are not described here. Select those elements, which most closely match the circumstances and add in any other sources or problems. It should be noted that many of the solutions to noise issues will also help control other emissions from the installation. However, in some circumstances, noise control may compromise other issues such as odour control. Care must also be taken to ensure a balanced approach is adopted.

Two reports prepared for MAFF (now DEFRA) in 1999 offer guidance on the control of noise on pig and poultry installations (References 3 and 4).

Many noise problems can be prevented by good management, consideration and ensuring a good standard of maintenance of plant and equipment. The hierarchy for control should be to:

1. **Prevent** generation of noise at source by good design and maintenance.
2. **Minimise or contain noise at source** by observing good operational techniques and management practice.
3. **Increase the distance** between the source and receiver.
4. **Use physical barriers or enclosures** to prevent transmission to sensitive receptors.
5. **Sympathetic timing and control** of unavoidably noisy operations.

### Prevention and minimisation

Good design and management can prevent the generation of noise. This can include:

- selection of plant and equipment that produce less noise;
- suitable timing of noisy operations.

It is far easier to deal with potential noise problems at the design stage of new, extended or altered installations. It is often more effective to purchase quieter equipment, that is slightly more expensive, than to modify plant at a later date. Many manufacturers now provide detailed noise information for their products.

### Increase the distance between the source and receiver

Care should be taken to site noisy activities away from noise-sensitive areas. The day to day location of equipment and vehicles on the installation and the way in which they are used can play a major part in reducing noise levels. Some noise sources are directional, such as fans or engine exhausts, and simply turning the noisy aspect away from the sensitive receptors can noticeably reduce the noise levels.

### Acoustic barriers

The following are examples of good acoustic barriers:

- buildings on site;
- earth banks;
- heavy and solid close boarded wooden fencing, masonry walls;
- straw bales can provide good temporary noise barriers provided there is no fire risk.

All barriers should be high enough to break the line of sight and extend beyond the noise source so that the noise does not “wrap” around the ends and top of the barrier. Vegetation barriers (trees and hedges) are often thought to provide a degree of noise reduction if planted between the source and local dwellings. However, in practical terms, the reduction of noise is marginal, unless the planting is very thick and wide. The psychological effect of removing the noise source from view may have a much greater overall effect on the perception of the noise rather than the actual noise reduction offered.

### **Noise management in intensive livestock installations**

This section identifies the more common noise problems arising on installations and offers suggestions for preventing or reducing noise in each case. Not all of the sub-sections will apply to all installations and some will have noise sources not discussed below. All aspects of noise management will be determined on a site-specific basis.

In many cases, restricting noisy operations to reasonable times may be sufficient to overcome environmental noise problems. Reasonable times are generally considered to be the ‘normal’ working day, but it is understood that certain activities may have to be undertaken outside this time. In this case additional measures may be required in order to achieve a satisfactory noise climate. In addition, noise emitted by activities such as feed milling can be reduced considerably by enclosure within insulated buildings. It should be remembered however that the effectiveness of any form of building or enclosure as a means of reducing noise can be severely compromised by leaving doors, windows or unguarded vents open.

<b>Problem</b>	<b>Actions to prevent or minimise noise</b>
<b>Feed, fuel and other deliveries</b>	<p><b>Location</b> Feed bins should be located so that, as far as possible, delivery movements and handling on site are reduced. Their location should not be in conflict with biosecurity arrangements.</p> <p>Delivery and collection points for feed, fuel, other materials, livestock, slurry and other waste should be sited, as far as is practicable, to benefit from the noise screening effects of local barriers, such as the lie of the land and buildings, to achieve optimum benefit.</p> <p><b>Operation</b> Staff, contractors and visitors should be instructed not to raise voices or play radios unnecessarily at night. Pagers or mobile phones may need to be considered for on-site communications.</p> <p>Materials should be lowered on to hard surfaces rather than</p>

	<p>dropped. The drop height of any bulk material should be reduced as much as possible.</p> <p><b>Timing of operations</b>  Delivery and collection of feed, fuel, other materials, livestock, slurry and other wastes should take place at reasonable times, i.e. during the normal working day, as far as is practicable. Drivers should comply with any speed limits on site and avoid taking empty vehicles over rough ground wherever possible.</p>
<b>Ventilation fans</b>	<ul style="list-style-type: none"> <li> <b>Design</b>  Efficient design of ventilation fans will minimise the number needed per building.   The use of sheet metal or other similar materials of construction, which may vibrate, should be avoided, where practicable.   Use fewer, larger fans operating at lower speeds or variable speed fans that may produce less noise than smaller high speed fans. N.B Although this is an effective means of noise control, variable speed fans are less effective at odour dispersion so a balance needs to be achieved.   Minimising the resistance at the inflow and outflow to avoid placing unnecessary loading on each fan. Fan outlet cowls and stacks can provide noise reduction but, if too small, can increase the pressure drop by restricting airflow. </li> <li> <b>Location</b>  Orientate noisy equipment in one direction so that noise is directed away from noise-sensitive areas.   Locate fans at low level, i.e. on sidewalls, rather than at rooftop level as any noise emitted will be more readily blocked by other buildings, local topography etc. N.B. Although this is an effective means of noise control, this may be much less effective at odour dispersion so a balance needs to be achieved.   Use acoustic barriers to absorb the noise. </li> <li> <b>Operation</b>  The use of inlet silencers may be suitable for fan pressurised ventilation systems.   Increase the absorption capacity of a building by increasing the presence of rough surfaces such as straw bales inside to absorb sound. </li> <li> <b>Timing of operations</b>  Poultry – a small number of fans operating continuously is preferable to a larger number, switching off and on, particularly at night. However, a number of fans running continuously may not give the correct minimum ventilation required by the operator. </li> <li> <b>Inspection and maintenance</b>  Fans should be maintained and inspected in accordance with the manufacturers or suppliers instructions. Out of balance or worn fans can produce high noise levels with annoying frequencies or tones. </li> <li> <b>ACNV (Automatically Controlled Natural Ventilation)</b>  ACNV is an alternative method of ventilation but its use may be restricted by welfare or production factors and may be less </li> </ul>

	<p>effective at odour dispersion. Its effectiveness can be affected by its location, in particular being sheltered by other buildings, hedges etc. such that it is not always a viable alternative to fan-assisted ventilation.</p>
<b>Vehicles and machinery on site</b>	<p><b>Ensure that you comply with Health and Safety requirements when considering how to reduce noise from vehicles and machinery.</b></p> <ul style="list-style-type: none"> <li> <b>Design</b>            Reduce the need for scraping by minimising the area of yard contaminated when removing manure and litter from buildings.             Pressure washers and compressors may need to be placed inside buildings, purpose built or proprietary acoustic enclosures during use. Always consult with the manufacturer or supplier before enclosing any plant since suitable ventilation may be required to prevent overheating.         </li> <li> <b>Location</b>            Noisy machinery and operations should be sited as far as possible from noise sensitive areas.             Loading/offloading points can be screened by the use of natural barriers (buildings, fences) or temporary screens such as straw bales.             Generators should be placed within an acoustic enclosure or sited behind an acoustic barrier. Suitable insulation can be provided as part of a packaged generator set or by the use of an acoustically insulated building. Consideration should be given to the frequency of use, the level of risk involved and the cost implication.         </li> <li> <b>Operation</b>            Care should be taken to prevent unnecessary movements of trailers and loaders.             Avoid idling of machines between work periods and revving of engines.             Catching should be organised to minimise manoeuvring of forklift trucks etc. outside of buildings.             Staff, contractors and visitors should be instructed not to raise voices or play radios unnecessarily at night. Pagers or mobile phones may need to be considered for on-site communications.         </li> <li> <b>Timing of operations</b>            If powered equipment is used, cleaning out and removal of manure and litter should take place at reasonable times, where practicable.         </li> <li> <b>Inspection and maintenance</b>            Site roads/tracks should be maintained in a state of good repair to reduce any noise from the passage of vehicles.             Ensure loaders and tractors etc. are well maintained especially exhaust systems and silencers.             Reduce noise caused by vibrating machinery with rotating parts by proper servicing, balancing and regular maintenance. Lack of maintenance may lead to overheating, resulting in engine covers         </li> </ul>

	<p>having to be left open.</p> <p>Reduce noise caused by friction in conveyor rollers, trolleys and other machines by proper lubrication and regular maintenance.</p> <p>Testing of emergency generators and alarms should be carried out during the daytime of the normal working week and preferably between 0900 and 1700. The noise level emitted by the alarms must not exceed that required to alert persons working within the site. However, to ensure the response given by call centres is 100%, alarms may also be tested at weekends. The disturbance caused by their testing can be minimised by testing at the same time and day of the week or month etc. If there are problems, local residents should be consulted and timings of testing discussed with them. Testing should be in accordance with manufacturer or supplier instructions.</p>
<b>Feeding equipment</b>	<ul style="list-style-type: none"> <li>• <b>Design</b> Auger systems are usually the quietest and most energy efficient method of transporting feed mechanically.</li> <li>• <b>Operation</b> Conveyors or augers should not normally be operated when they are empty.  Pipe and/or conveyor runs should be kept as short as possible.  Pneumatic transfer systems can be a source of high frequency noise. It is often preferable to use a higher capacity system running at a lower speed than to use a low capacity system at a high speed.</li> <li>• <b>Timing of operations</b> Feed mills should be operated at reasonable times. Operate hammer mills and pneumatic conveyors when background noises are highest to minimise effect.</li> <li>• <b>Inspection and maintenance</b> Maintain equipment to ensure equipment is operating to optimum standards.</li> </ul>
<b>Manure and slurry handling</b>	<ul style="list-style-type: none"> <li>• <b>Design</b> External runs should be constructed so that they are protected from the weather and to prevent noise generation.  Pneumatic conveyor systems should be designed to minimise the length of the run and number of bends.</li> <li>• <b>Location</b> Conveyors for manure should be contained within a suitably constructed enclosure appropriately designed to reduce noise emissions.</li> <li>• <b>Timing of operations</b> Operate equipment and vehicles at reasonable times, whenever possible.</li> <li>• <b>Inspection and maintenance</b> Maintain equipment to ensure equipment is operating to optimum standards.</li> </ul>
<b>Animal noise</b>	<ul style="list-style-type: none"> <li>• <b>Feeding pigs</b></li> </ul>



	<p>Use passive feeding techniques where appropriate, to minimise squealing in anticipation of feeding.</p> <p>Reduce noise produced in response to a stimulus prior to feeding by direct delivery of feed.</p> <ul style="list-style-type: none"> <li>• <b>Stocking and de-stocking between cycles</b> The timing and methods used in stocking and de-stocking of animals should be carefully considered to minimise any noise produced.</li> </ul>
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### Step 3: Draw up Noise Management Plan

Transfer the information obtained in Steps 1 and 2 into the Noise Management Plan:

- Identify each noise source in the 'Noise Source' column.
- Select the appropriate corrective action from Section 2 for each problem. Adapt it to your particular circumstances – what would you do on your installation to achieve the same outcome?
- Identify the corrective actions in the 'Actions' column.

An example of a management plan is given below. You can use these columns/ headings as a template to develop your own plan.

Table 1 Example Noise Management Plan Template

No ref	Noise Source	Actions you will take to prevent or minimise the noise	Completion date
1	Rattling and clanking from operation of conveyor	Regular maintenance and proper lubrication. Minimise empty conveyor running.	
2	Rearing of broiler chickens in ventilated houses	Fans maintained and inspected to manufacturers instructions. Inspect roof on House No.5 and fasten down metal sheeting. Review once completed.	
3	Early morning loading of pigs for transport	Load animals behind machinery store to act as a barrier between animals and New Village Cottages. Instruct contractors not to whistle and shout.	
4	Bird catching	All handlers trained to Assured Chicken Production standards to minimise bird stress and noise.	
5	Cleaning of animal housing	In reasonable time only. Notice of manure movements given to neighbours 1 week in advance. Litter is moved from housing direct to trailers in the doorways of the buildings and removed immediately from site, to minimise vehicle movements.	
6	Emergency generator	Test time Tuesday 11am. Timing agreed with neighbours. If emergency generation is required, Neighbours will be notified within x hours.	
7	Bird feeding	The existing conveyor system to be replaced by auger system by MM/YYYY.	
8	Delivery of feed	No deliveries outside 7pm. Feed company X has fitted silencers to all vehicles for transfer to feed bins.	
9	Delivery of fuel	No deliveries outside 6pm.	
10	Other (specify) Advice for staff, contractors	Advice notices in site office covering points above. Instruction not to shout unnecessarily.	

	and visitors	Instruction to turn off engines while not in use.	
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## Complaints procedure

A procedure should be established to accompany your noise management plan, for verifying and responding to complaints about noise. The existence of a complaints procedure can help you to:

- improve relationships with neighbours;
- identify sources of noise and prevent future problems.

Prompt action in response to complaints, including a discussion with an explanation to the complainant, is very important and may stop issues escalating and further complaints being made. It should be remembered that when people are woken at night, for example, by something that they believe to be avoidable (whether it is or not) they might be short-tempered. A quick and sympathetic response to complaints can often defuse a situation to the benefit of the complainant and the operator. The method of dealing with and recording complaints is exactly the same as that given for odour in Appendix 4.

Following complaints you may need to review the noise management plan, and look at alternative or additional noise prevention measures.

The complaints record relating to activities covered by the permit should be made available to SEPA on request.

## Full noise impact assessment

A noise impact assessment may be carried out by either measuring emissions or predicting emissions. The method chosen depends on whether it is an existing installation, an extension to an existing installation or a proposal for a new installation. A full assessment will almost certainly have to be carried out by a noise expert who is suitably qualified and/or experienced in undertaking and reporting environmental noise assessments.

At existing installation, the noise levels would normally be measured at the most affected sensitive receptors and then compared to the background levels and recognised standards such as BS 4142:1997. However, in some cases the noise levels may be measured closer to the installation and then used to calculate the levels at the affected receptors.

In the case of a new installation, or an extension to an existing one, it is more likely that the levels will have to be estimated. The predictions can be based on the noise from the existing installation, manufacturer's data or data from a similar installation or a combination of all, or any, of these. Justification should be given for any assumed data.

Further details on how to carry out a full noise impact assessment are provided in SEPA's "Guidance on Control of Noise at PPC Installations".

## References

Guidance on the Control of Noise at PPC Installations, SEPA.

([http://www.sepa.org.uk/pdf/ppc/guidance/ppc\\_noise\\_guidance.pdf](http://www.sepa.org.uk/pdf/ppc/guidance/ppc_noise_guidance.pdf))

BS 4142:1997 Method for rating industrial noise affecting mixed residential and industrial areas, BSI ISBN 0 580 28300 3.

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