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for Environment
Food & Rural Affairs

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Process Guidance Note 6/24(13)

Statutory guidance for pet food manufacturing

December 2013



Llywodraeth Cymru
Welsh Government



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Revision of the guidance

The electronic version of this publication is updated from time to time with new or amended guidance. **Table 0.1** is an index to the latest changes (minor amendments are generally not listed).

Table 0.1 - Revision of the guidance		

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1. Introduction

Legal basis

- 1.1 This note applies to the whole of the UK. It is issued by the Secretary of State, the Welsh Government, the Scottish Government and the Department of the Environment in Northern Ireland (DoE NI) to give guidance on the conditions appropriate for the control of emissions into the air from wet and dry pet food manufacturing processes and installations, including those that involve the processing of raw animal material. It is published only in electronic form and can be found on the [Defra](#) website. It supersedes PG6/24a(05), PG6/24b(05) and NIPG 6/24a Version 1(2005) and NIPG 6/24b Version 1(2005).
- 1.2 This guidance document is compliant with the [Code of Practice on Guidance on Regulation](#) page 6 of which contains the "golden rules of good guidance". If you feel this guidance breaches the code or you notice any inaccuracies within the guidance, please [contact us](#).
- 1.3 This is one of a series of statutory notes giving guidance on the Best Available Techniques (BAT). The notes are all aimed at providing a strong framework for consistent and transparent regulation of installations regulated under the statutory Local Air Pollution Prevention and Control (LAPPC) regime in [England and Wales](#), [Scotland](#) and [Northern Ireland](#). The note will be treated as one of the material considerations when determining any appeals against a decision made under this legislation. Further guidance on the meaning of BAT can be found for [England and Wales](#), [Scotland](#), and [Northern Ireland](#).
- 1.4 In general terms, what are BAT for one installation in a sector are likely to be BAT for a comparable installation. Consistency is important where circumstances are the same. However, in each case it is, in practice, for regulators (subject to appeal) to decide what are BAT for each individual installation, taking into account variable factors such as the configuration, size and other individual characteristics of the installation, as well as the locality (e.g. proximity to particularly sensitive receptors).
- 1.5 The note also, where appropriate, gives details of any mandatory requirements affecting air emissions which are in force at the time of publication, such as those contained in Regulations or in Directions from the Government. In the case of this note, at the time of publication there were no such mandatory requirements.

Simplified or standard permits

- 1.6 The activities covered by this note will have essentially the same characteristics and it is expected that the application form and model permit in **Appendices 1 and 2** will normally be used in order to simplify for business the process of applying for a permit and to simplify for regulators the process of issuing a permit. (See also the relevant LAPPC charging scheme for reduced application and subsistence charges for simplified permits).

If there are good reasons to consider diverging from normal use of the model permit, the starting point for drafting any additional conditions should be the arrowed bullets in the main body of this note.

Who is the guidance for?

- 1.7 This guidance is for:

Regulators

- local authorities in England and Wales, who must have regard to the guidance when determining applications for permits and reviewing extant permits;
- the Scottish Environment Protection Agency (SEPA) in Scotland, and district councils or the Northern Ireland Environment Agency (NIEA), in Northern Ireland;

Operators who are best advised also to have regard to it when making applications and in the subsequent operation of their installation;

Members of the public who may be interested to know what the Government considers, in accordance with the legislation, amounts to appropriate conditions for controlling air emissions for the generality of installations in this particular industry sector.

Updating the guidance

- 1.8 The guidance is based on the state of knowledge and understanding, at the time of writing, of what constitute BAT for this sector. The note may be amended from time to time to keep up with developments in BAT, including improvements in techniques, changes to the economic parameters, and new understanding of environmental impacts and risks. The updated version will replace the previous version on the [Defra](#) website and will include an index to the amendments.

- 1.9 Reasonable steps will be taken to keep the guidance up-to-date to ensure that those who need to know about changes to the guidance are informed of any published revisions. However, because there can be rapid changes to matters referred to in the guidance – for example to legislation – it should not be assumed that the most recent version of this note reflects the very latest legal requirements; these requirements apply.

Consultation

- 1.10 This note has been produced in consultation with relevant trade bodies, representatives of regulators including members of the Industrial Pollution Liaison Committee and other potentially-interested organisations.

Policy and procedures

- 1.11 General guidance explaining LAPPC and setting out the policy and procedures is contained in separate documents for [England and Wales](#), [Scotland](#) and [Northern Ireland](#).

When to use another note rather than PG6/24

- 1.12 There is separate guidance for the following processes:
- PG6/19 - manufacturing fish meal and oil
 - PG6/26 - animal feed compounding

2. Timetable for compliance and reviews

Existing processes or activities

- 2.1 This note contains all the provisions from previous editions of both PG6/24a and PG6/24b which have not been removed. Some have been amended. For installations in operation at the date this note is published, the regulator should have already issued or varied the permit having regard to the previous editions. If they have not done so, this should now be done.
- 2.2 The new provisions of this note and the dates by which compliance with these provisions is expected are listed in **Table 2.1**, together with the paragraph number where the provision is to be found. Compliance with the new provisions should normally be achieved by the dates shown. Permits should be varied as necessary, having regard to the changes and the timetable.

Table 2.1 - Compliance timetable		
Guidance	Relevant paragraph/row in this note	Compliance date
A simple permit and application form have been added in Appendix 1 and Appendix 2 .		
There are no new provisions in this note likely of themselves to result in a need to vary existing permit conditions. For a full list of changes made by this note, excluding very minor ones, see Table 6.1 . See also paragraph 2.4 .		

- 2.3 Replacement plant should normally be designed to meet the appropriate standards specified for new installations/activities.
- 2.4 Where provisions in the preceding guidance note have been deleted or relaxed, permits should be varied as necessary as soon as reasonably practicable. It is expected that local authorities will aim to vary existing permits so as to convert them into the model permit format in **Appendix 1** within 12 months of the publication of this note.
- 2.5 For new activities, the permit should have regard to the full standards of this guidance from the first day of operation.
- 2.6 For substantially changed activities, the permit should normally have regard to the full standards of this guidance with respect to the parts of the activity that have been substantially changed and any part of the activity affected by the change, from the first day of operation.

Permit reviews

- 2.7 Under LAPPC, the legislation requires permits to be reviewed periodically but does not specify a frequency. It is considered for this sector that a frequency of once every eight years ought normally to be sufficient for the purposes of the appropriate Regulations. Further guidance on permit reviews is contained in the appropriate Guidance Manual for [England and Wales](#) chapter 26, [Scotland, Practical guide](#) section 10, [Northern Ireland Part B Guidance](#) page 9, Northern Ireland [Part C Guidance](#) chapter 17. Regulators should use any opportunities to determine the variations to permits necessitated by paragraph 2.2 above in conjunction with these reviews.
- 2.8 Conditions should also be reviewed where complaint is attributable to the operation of the process and is, in the opinion of the regulator, justified.

3. Activity description

Regulations

- 3.1 This note applies to LAPPC installations for pet food manufacturing, including those involving the processing of raw animal material. The activities for regulation are listed in **Table 3.1**.

Table 3.1 - Regulations listing activities			
LAPPC Activity	England and Wales	Scotland	Northern Ireland
	EPR Schedule 1 reference	PPC Schedule 1 reference	PPC Schedule 1 reference
Part B	Section 6.8 Part B	Section 6.8 Part B	n/a
Part C	n/a	n/a	Section 6.8 Part C

The links are to the original version of the Regulations. A consolidated version is not available on www.legislation.gov.uk

For England and Wales, an [unofficial consolidated version](#) is available but read the first page of that document in order to understand its status and content.

- 3.2 The pet food manufacturing sector is very diverse. This note, PG6/24, refers to processes to the manufacture of moist and semi-moist pet foods involving the use of raw animal material (including canned food, brawns and chubs, pet treats such as bones, jerky, paddywack and frozen foods). This note also covers pet food manufacturing where raw animal materials are not involved and these processes are generally for the manufacture of dry pelletised, flaked or shaped products which would involve the use of vegetable materials and some pre-processed animal materials. This note also covers pet fish food manufacturing processes.
- 3.3 There is also separate guidance for processes manufacturing fish meal and oil (PG6/19); rendering of animal material (see Sector Guidance (SG) 8) and for animal feed compounding processes (PG6/26).

3.4 The disposal of certain animal by-products fall under the controls of a European Regulation laying down health rules as regards animal by-products and derived products not intended for human consumption. Regulation (EC) 1069/2009, and the accompanying implementing Regulation (EC) 142/2011, applies from 4 March 2011 and repeals Regulation 1774/2002 (Animal by-products Regulation). The Regulation specifies the permitted disposal methods for animal by-products, controls and records the movement of animal by-products and also details hygiene requirements in the collection, transport, storage and processing of animal by-products. Some of the animal materials used in the pet food manufacturing process may fall within these controls. Where there is any conflict between the standards of this note and the EU Regulation 1069/2009, the tighter standard should prevail because the Regulation is primarily concerned with the veterinary requirements of animal by-product disposal and for prevention of pathogens in animal feedstuffs.

3.5 The EU Regulations are enforced through the:

- [Animal by-Products \(Enforcement\) \(England\) Regulations 2011 \(as amended\)](#)
- [Animal By-Products \(Enforcement\) \(Scotland\) Regulations 2011 \(as amended\)](#)
- [Animal By-Products \(Enforcement\) \(No. 2\)\(Wales\) Regulations 2011](#)

Process or activity

3.6 In the context of this note, "process" or "activity" comprises the whole process from receipt of raw materials via production of intermediates to dispatch of finished products, including the treating, handling and storage of all materials and wastes relating to the process.

3.7 There are three basic products of the pet food manufacturing industry:

- moist (usually more than 60% moisture), for example canned, frozen uncooked and brawns;
- semi-moist (usually 25-40% moisture); **and**
- dry products (usually less than 15% moisture) e.g. baked products and dry, flaked or extruded products.

3.8 In the case of moist products, the process involves the preparation of either fresh or frozen animal, bird or fish materials through a size reduction process, then through a product mixing system, involving meat, gravy and in some cases cereals to a predetermined recipe. The material is usually then packaged (for example, canned) prior to being sterilised and cooked by steam, although packaging may occur after cooking.

- 3.9 In the semi-moist process, fresh or frozen animal, bird or fish materials are mixed with other ingredients to a predetermined recipe, which is usually extruded before packaging.
- 3.10 The manufacture of treats is a widely varying process and may involve a cooking or frying process (such as for the production of bones or paddywack) or a drying process with or without extrusion (such as for the production of dog chews and jerky).
- 3.11 In addition certain processes are undertaken which involve:
- a) the production of partly-processed fresh, chilled, frozen and partially-cooked, or fully-cooked, material supplied to separate processes for further production into a product ready for consumption;
 - b) the production of fresh, chilled or frozen uncooked material ready for consumption.
- 3.12 In the dry process (for example, the manufacture of biscuits, meals and flaked cereal products) fats, dry products and in some cases gravy, are blended and cooked prior to packaging.

Potential releases

- 3.13 The key emissions from these processes that constitute pollution and therefore warrant control are those which may lead to offensive odour beyond the process boundary. Some processes covered by this note may also emit particulate matter. The odorous emissions are a complex cocktail of chemical species and may contain ammonia, amines, organic sulphur compounds, and volatile organic compounds.
- 3.14 The primary releases from the process are odours and these are required to be contained. The potential release points are from:
- raw material reception, storage and handling;
 - the physical process operations;
 - the cooking, drying or cooling process;
 - the storage, handling and transport of the product and waste remaining at the end of the process;
 - the storage and discharge of liquid waste and effluent from the process and odour arrestment plant;
 - the odour arrestment plant discharge (this may be a stack or vent or may be a biofilter with an area source at ground level).

- 3.15 Whilst the odours will vary depending on the raw material type, quality and the process configuration, it is possible to divide the releases into high intensity and lower intensity odours.

The presence of fugitive emissions and odours from building air should be greatly reduced where odours are effectively contained within the processing equipment and if the process is well managed, it is often only necessary to arrest the higher intensity odours from the cooking/drying/cooling processes found in wet pet food manufacturing. The emissions from drying, cooking and cooling of dry pet food manufacture, should be lower intensity.

- 3.16 There may be some occasions where the process operations include processing large quantities of odorous materials such as fish meal or fish oil and in this case emissions may be regarded as high intensity.

- 3.17 The following are the five main odour emission sources along with a preliminary categorisation of the typical odour intensity:

1. Fugitive emissions from raw material handling and raw material storage. Providing that raw materials are effectively managed (based upon raw material quality and the proposed storage time and temperature), these emissions should be lower intensity.
2. Fugitive emissions from leakage during transfer in process. These emissions will typically be contained within a building and provided the processing equipment is enclosed and maintained under a negative pressure, emissions from this source should be lower intensity.
3. Emissions from the dryer/cooker are usually condensed before treatment and would be regarded as high intensity odours. In some cases where pet food is steam-sterilised in hermetically sealed packs, the odours may be significantly reduced and may not require arrestment.
4. Emissions from the cooler where at elevated temperature and containing significant moisture may also be condensed before treatment and would be regarded as high intensity odours.
5. Fugitive emissions from product handling and storage should be lower intensity.

- 3.18 Operators are advised that careful consideration should be given to the impact of relatively minor process changes on odour releases from the process. It will be necessary to review the **odour response procedure** detailed in **Appendix 3** to identify the potential effects of the proposed changes.

- 3.19 Where the odour arrestment plant comprises a scrubber, emissions of materials which are added to the scrubber for improved performance (such as acids, hypochlorite, sodium hydroxide etc.) may be released with the plume if the scrubber and mist eliminator are not properly managed.
- 3.20 Where a thermal oxidiser or other combustion plant is used for the arrestment of odours, the emissions will be characteristic of the combustion releases from the fuel. These will include:
- sulphur dioxide from the burner, influenced by the sulphur content of the fuel;
 - oxides of nitrogen from the combustion equipment. The emission depends on the nitrogen content of the fuel, the amount of excess air, the flame temperature and the burner type;
 - carbon monoxide, which may be emitted if the combustion process is badly managed;
 - metals, volatile organic compounds, chlorides and fluorides may also be emitted where waste or recovered oil is used in the combustion equipment.
- 3.21 Emissions of particulate matter may arise from the processing and size reduction (grinding and milling) of dry materials. Other fugitive emissions of dust may arise from transfer of potentially dusty materials including discharge into hoppers and onto conveyors, and delivery to storage silos and storage sheds. Also material collected by bag filters, if it is not securely contained and carefully handled. The dust may also be odorous.

4. Emission limits, monitoring and other provisions

- 4.1 Emissions of the substances listed **Table 4.1** should be controlled.
- 4.2 The emission limit values and provisions described in this section are achievable using the best available techniques described in **Table 4.1**. Monitoring of emissions should be carried out according to the method specified in this section or by an equivalent method agreed by the regulator. Where reference is made to a British, European, or International standard (BS, CEN or ISO) in this section, the standards referred to are correct at the date of publication. (Users of this note should bear in mind that the standards are periodically amended, updated or replaced.) The latest information regarding the monitoring standards applicable can be found at the [Source Testing Association website](#). Further information on monitoring can be found in Environment Agency publications, [M1 and M2](#).
- 4.3 All activities should comply with the emission limits and provisions with regard to releases in **Table 4.1**.

The reference conditions for limits in **Section 4** are: 273.1K, 101.3kPa, without correction for water vapour content, unless stated otherwise.

Table 4.1 should be considered in conjunction with the monitoring paragraphs found later in this section.

Odours - principles of BAT in this note

- 4.4 The approach promulgated in this note to reflect BAT includes:
- an emission standard for odour (paragraph 4.7) and a performance standard for odour arrestment plant (**Table 4.1**, Rows 1 and 2);
 - containment of odours;
 - daily inspections of odour arrestment plant;
 - indicative tests for odour arrestment plant (paragraph 4.14) in the case of offensive odours being detected or complaints being received;
 - the preparation of an odour response procedure (ORP) (see paragraph 5.26 and **Appendix 3**) which will include an assessment of all emission sources, control methods, odour impacts, abnormal operations and measures to mitigate effects in the case of abnormal conditions.

Odour boundary condition

- 4.5 In the case of the activities covered by this note, local authorities should consider whether the odour generated by such activities is comparable in its offensiveness to that generated by animal rendering. If so, the considerations set out in **Appendix 5** in relation to the imposition of an odour boundary condition will apply equally to such cases.
- 4.6 Most pet food manufacturing installations are unlikely to need an odour boundary condition, where the emissions are likely to be less offensive than animal rendering process emissions; specific conditions designed to minimise the escape of offensive odours should be sufficient.

Emissions of odour

- 4.7 The overall aim should be that all emissions are free from offensive odour outside the site boundary as perceived by the regulator.

However, the location of the installation will influence the assessment of the potential for odour impact as local meteorological conditions may lead to poor dispersion conditions. Where the site has a low odour impact due to its remoteness from sensitive receptors, the escape of offensive odour beyond the site boundary would be unlikely to cause harm.

In these circumstances it is expected that the operations should be optimised to minimise odour emissions and also that effective process management is applied. Assessment of the potential for offensive odour beyond the site boundary should take account of all predicted wind directions and weather conditions, which are typical of the location in question.

Visible emissions

- 4.8 The aim should be to prevent any visible airborne emission from any part of the process. This aim includes all sites regardless of location. Monitoring to identify the origin of a visible emission should be undertaken and a variety of indicative techniques are available.
- where ambient monitoring is carried out it may also be appropriate for the regulator to specify recording of wind direction and strength;
 - where combustion units are in use for dryers then the combustion process should be controlled and equipment maintained as appropriate.

Emissions from combustion processes should in normal operation be free from visible smoke. During start up and shut down the emissions should not exceed the equivalent of Ringelmann Shade 1 as described in British Standard.

- All other releases to air, other than condensed water vapour, should be free from persistent visible emissions.
- All emissions to air should be free from droplets.

4.9 Where there are problems that, in the opinion of the regulator, may be attributable to the installation, such as local complaints of visual emissions or where dust from the installation is being detected beyond the site boundary, the operator should inspect in order to find out which operation(s) is the cause.

If this inspection does not lead to correction of the problem then the operator should inform the regulator who will determine whether ambient air monitoring is necessary. Ambient monitoring may either be by a British Standard method or by a method agreed with the regulator.

Whilst problems are ongoing, a visual check should also be made once per day/shift, by the operator, when an installation is being operated. The time, location and result of these checks, along with weather conditions such as indicative wind direction and strength, should be recorded. Once the source of the emission is known, corrective action should be taken without delay and where appropriate the regulator may want to vary the permit in order to add a condition requiring the particular measure(s) to be undertaken.

Table 4.1 - Emission limits, monitoring and other provisions

Row	Substance	Source	Emission limits/provisions	Type of monitoring	Monitoring frequency
1	Odour	Contained High Odour Intensity process releases	Where installed any odour arrestment plant installed on high odour intensity emissions (see paragraph 3.14 - 3.15) should have an odour removal efficiency of not less than 95% (see also note c).	Determination by manual extractive sampling and analysis by dynamic olfactometry in accordance with BS EN 13725.	On installation of new / replacement odour arrestment equipment and / or in the circumstances described in paragraph 4.14.
2	Odour	Contained Lower Odour Intensity process releases	Where installed any odour arrestment plant installed on lower odour intensity emissions (see paragraph 3.14 - 3.15) should have an odour removal efficiency of not less than 85% (see also notes b & c).		
3	Particulate matter	Emissions from contained sources. See also note a.	20 mg/m ³	EITHER Filter leak monitor <ul style="list-style-type: none"> provide visual alarms record trend output and alarms plus <ul style="list-style-type: none"> extractive test 	<ul style="list-style-type: none"> continuous plus <ul style="list-style-type: none"> every 3 years
		OR Gross filter failure device <ul style="list-style-type: none"> provide audible and visual alarms plus <ul style="list-style-type: none"> extractive test 		<ul style="list-style-type: none"> continuous plus <ul style="list-style-type: none"> annual 	
		Silo inlets and outlets	Designed to emit less than 10mg/m ³		At time of delivery

Notes

- a) the continuous monitoring provision should be disapplied where emissions do not exceed 20 mg/m^3 without the use of abatement plant. This should be demonstrated by a single sampling exercise undertaken in accordance with **paragraph 4.2**. A further such monitoring exercise may be required in the event of a substantial change to the process
- b) in cases where the inlet odour concentrations are very low the accepted odour arrestment plant efficiency should be either a destruction efficiency of 85% or the final discharge to air should contain less than $200 \text{ odour units/m}^3$ (due to measurement reproducibility and plant efficiency at low concentrations).
- c) in cases where emissions from both high and lower odour intensity sources are vented to the same odour arrestment plant, odour should be calculated in terms of mass odour flows and the overall destruction efficiency should be sufficient to ensure that the high odour intensity source has been reduced by 95%.
- d) For example if the high intensity odour source was $126,000 \text{ ou/m}^3$ in $4,000 \text{ m}^3/\text{hr}$ of air and the lower intensity source was $4,000 \text{ ou/m}^3$ in $27,000 \text{ m}^3/\text{hr}$, this equates to a mass flow of $140,000 \text{ ou/s}$ and $30,000 \text{ ou/s}$ respectively. The required destruction efficiency would lead to a maximum emission of $7,000 \text{ ou/s}$ from the high intensity source (95%) and $4,500 \text{ ou/s}$ from the lower intensity source (85%). The maximum permitted emission would be $1,335 \text{ ou/m}^3$ in a total flow of $31,000 \text{ m}^3/\text{hr}$.

Existing abatement plant

- 4.10 It may be the case that operators can demonstrate that lower odour removal efficiencies than those in **Table 4.1** will meet the provisions paragraph 4.7.
- 4.11 For existing plant, provided the operator can satisfactorily demonstrate that the operation of plant at lower odour removal efficiencies meets the provisions of paragraph 4.7 then these lower odour removal efficiencies should apply.

New / replacement abatement plant

- 4.12 Where it can be demonstrated that the provisions of paragraph 4.7 are being met new/replacement plant may be operated at odour removal efficiencies lower than those specified in **Table 4.1**. To provide such a demonstration, operators should determine, using dispersion modelling or an alternative appropriate technique, what percentage efficiencies are required to meet the provisions of paragraph 4.7.

Odorous emissions - monitoring installation performance

- 4.13 The operator should monitor the performance of the installation for emissions which may result in offensive odours beyond the boundary. This assessment should include inspections of the process, buildings and equipment to check that emissions are being contained and treated to meet the standards of this note.
- In addition to the continuous monitoring, the odour arrestment plant should be inspected at least once a day to verify correct operation and to identify any malfunctions.
 - This inspection should include:
 - identification of any leaks in air handling equipment and ductwork. Where a key component of the odour arrestment plant cannot be adequately accessed for inspection then arrangements to enable this should be made;
 - in the case of scrubbing equipment, thermal oxidisers and other combustion plant, verification of the operation of the continuous monitoring equipment, any blockages and also identification of any leaks of either odorous air or liquid;
 - in the case of biofilters, the surface should be inspected to identify any cracking of the surface or voids in the bed, leaks around the edge of the filter or air handling equipment, review of the moisture content (considering both flooding and drying out) and looking for signs of compaction or uneven flow;

- in the specific case of soil biofilters, the growth of plants and weeds. Excessive flow or odour escape is often indicated by scorching of the earth or plant growth dying off.

Indicative tests for odour control equipment

- 4.14 If offensive odours are detected beyond the process boundary or complaints received but there is no obvious cause of odour release it may be necessary to check the odour arrestment plant performance.
- In the case of thermal oxidisers or combustion equipment, the combustion efficiency is a good indication of performance. Emissions tested in accordance with the first bullet of paragraph 4.23 should normally be below 100mg/m³. If emissions exceed this indicative guide value it is likely that the odour destruction efficiency of the arrestment plant is reduced and it should be further investigated to identify reasons for the reduced performance.

Particulate emissions from silos

- 4.15 Where silos are used for raw material and product storage the following measures relating to abatement plant on silos and other silo management techniques are only applicable where the silo vents to the external environment or where silo emissions may escape from inside a building into the external environment.
- All new or replacement silo filtration plant should be designed to operate to an emission standard of less than 10 mg/m³ for particulate matter.
- 4.16 Silo systems require appropriate inspections and assessments to minimise potential for emissions during the filling process. The following measures relating to arrestment plant on silos and other silo management techniques are only applicable where the silo vents to the external environment or where silo emissions may escape from inside a building into the external environment.
- Operators should have a procedure in place to ensure that visual assessment of emissions from silo inlet connections and the silo arrestment plant are undertaken throughout the duration of all bulk deliveries. The start and finish times of all deliveries should be recorded.

Inspection of filtration plant

- 4.17 Silo arrestment plant and filtration plant serving other process operations should be inspected at the frequency specified in **Table 4.2**:

Table 4.2 - Filtration plant inspection frequency	
Filter cleaning method	Frequency of visual inspection
Fitted with reverse jets	at least once a month
Fitted with mechanical shakers	at least once a week
Requiring manual shaking	daily inspection or prior to any delivery being made if deliveries are not daily

- The outlet should be checked for signs that emissions have occurred. The equipment should also be checked for defects in the air flow or the cam shakers. If emissions or defects are detected then corrective action should be taken promptly and before another delivery takes place. Any failure of the silo management system (e.g. high level alarms, filter, pressure relief valve) should lead to full investigation of the operation of the plant and equipment.
- Reduced inspection frequency of bag filter (or cartridge) abatement plant may be appropriate, as follows:
 - where pressure drop sensors are used to monitor bag blinding conditions or continuous emission monitors are used to monitor the emission performance of the abatement plant; such monitors should be inspected according to manufacturers' recommendations to ensure their proper operation;
 - where continuous camera operation enables observation of all emission points from the arrestment plant and pressure relief valves;
 - for filters fitted with reverse jets or with mechanical shakers where operating experience has demonstrated satisfactory operation of the arrestment plant;
 - where the process operation is infrequent.

Monitoring, investigating and reporting

4.18 The operator should monitor emissions, make tests and inspections of the activity. The need for and scope of testing, (including the frequency and time of sampling), will depend on local circumstances.

- The operator should keep records of inspections, tests and monitoring, including all non-continuous monitoring, inspections and visual assessments. Records should be:
 - kept on site;
 - kept by the operator for at least two years; **and**
 - made available for the regulator to examine.
- If any records are kept off-site they should be made available for inspection within one working week of any request by the regulator.

Information required by the regulator

4.19 The regulator needs to be informed of monitoring to be carried out and the results. The results should include process conditions at the time of monitoring.

- The operator should notify the regulator at least 7 days before any periodic monitoring exercise to determine compliance with emission limit values. The operator should state the provisional time and date of monitoring, pollutants to be tested and the methods to be used.
- The results of non-continuous emission testing should be forwarded to the regulator within 8 weeks of completion of the sampling.
- Adverse results from any monitoring activity (both continuous and non-continuous) should be investigated by the operator as soon as the monitoring data has been obtained. The operator should:
 - identify the cause and take corrective action;
 - clearly record as much detail as possible regarding the cause and extent of the problem, and the remedial action taken;
 - re-test to demonstrate compliance as soon as possible; **and** inform the regulator of the steps taken and the re-test results.

Abnormal events

- 4.20 The operator should respond to problems which may have an adverse effect on emissions to air.
- In the case of abnormal emissions, malfunction or breakdown leading to abnormal emissions the operator should:
 - investigate and undertake remedial action immediately;
 - adjust the process or activity to minimise those emissions; **and**
 - promptly record the events and actions taken.
 - The regulator should be informed without delay, whether or not there is related monitoring showing an adverse result:
 - if there is an emission that is likely to have an effect on the local community; **or**
 - in the event of the failure of key arrestment plant, for example, bag filtration plant or scrubber units.
 - The operator should provide a list of key arrestment plant and should have a written procedure for dealing with its failure, in order to minimise any adverse effects.
 - A simple wind direction indicator (such as a windsock or wind vane) should be installed in order that likely emission paths and areas of potential odour impact can be identified in the case of abnormal emissions.

Continuous monitoring

- 4.21 Continuous emissions monitors (CEMs) are normally either “quantitative” or “indicative”. With quantitative monitoring the discharge of the pollutant(s) of concern is measured and recorded numerically. For pollution control this measurement is normally expressed in milligrams per cubic metre of air, (mg/m³). Where discharge of the pollutant concerned is controlled by measuring an alternative parameter, (the “surrogate” measurement), this surrogate is also expressed numerically.

Types of continuous monitoring for particulate matter

4.22 One of the basic issues in obtaining good results from a particulate CEM is to ensure that the instrument is fit for purpose – it must give a stable, reliable response and be able to operate in the long term without the need for maintenance or cleaning. There are four categories of continuous particulate monitoring instruments used to satisfy regulatory requirements:

- **Quantitative instrument** - a particulate CEM which may be used to monitor mg/m^3 continuously and can be calibrated to a very high standard with sophisticated automatic self-checking data quality-assurance (QA) capabilities.
- **Qualitative instrument** - quantitative CEMs may be used in qualitative mode, where data is still generated in a mg/m^3 format but there is further uncertainty in the data.
- **Filter leak detector** - this indicative instrument monitors for changes in the operation of dust arrestment plant (typically a bag filter) and measures trends of plant operation over time. Importantly, the instrument has a QA self-check capability that influences confidence in the data that can be used for simple process control. In terms of alarms, step changes can be seen from analyses for trends over time.
- **Gross filter failure device** - a simple, indicative instrument that provides an alarm when there is a significant step-change in emissions i.e. rupture of a filter. They provide no information to improve plant performance, have no trend output or quality assurance features to provide confidence that they are working correctly.

A differential pressure gauge (a bag blinding detector) is also commonly fitted to a bagfilter to detect excessive pressure drop across the bags caused by bag blinding. This allows early detection of reduced filter suction and increased fan energy usage but, when used on a primary filter, a bag blinding detector provides no particle emission detection capability.

Continuous monitoring - odour control equipment

4.23 Where odour control equipment is used, continuous monitoring (linked to alarms) should be required, depending upon the type of plant used, as follows:

- In the case of thermal oxidisers or combustion equipment, emissions should be continuously monitored and continuously recorded for carbon monoxide, or the operating temperature may be used as a surrogate measurement. The monitor should be fitted with an audible and visual alarm to activate if the operating temperature falls below 1123K (850°C) or if the carbon monoxide level exceeds the indicative guide value in paragraph 4.14.

- In the case of scrubbing equipment, pH or Redox of the liquor and liquor flow should be continuously monitored. All liquid scrubbers should be fitted with an audible and visual alarm to activate if:
 - the liquor circulation fails;
 - if the pH falls outside the operating range established during commissioning testing;
 - if the Redox reading falls outside the correct range which will be variable and is established by regular testing of the scrubber liquor and operational experience.
 - if a bioscrubber is used, in addition to flow and pH or Redox monitoring, the pressure drop across the scrubber packing should be continuously monitored. The monitor should be fitted with an audible and visual alarm to activate if the pressure drop falls outside the operating range established during commissioning testing;
 - if a biofilter is used the pressure drop across the biofilter should be continuously monitored. This can be achieved by measuring the delivery pressure on the main fan. The monitor should be fitted with an audible and visual alarm to activate if the pressure drop falls outside the operating range established during commissioning testing. If the process has more than one fan for different process areas and these fans are not operated when the areas are not in use (for example during the winter period when production levels are low) the value used for alarming may need to be variable depending upon the volume of air being treated and process conditions. In this case, where the alarm level is varied, the set point of the alarm should be recorded;
 - the operating levels of the pH, Redox and pressure drop where monitored should be recorded daily.
- The cooling liquid flow of all direct or indirect condensers used for pre-treatment of emissions (including spray tower scrubbers) should be continuously monitored.

4.24 Where continuous monitoring is required, it should be carried out as follows:

- All continuous monitoring readings should be on display to appropriately trained operating staff.
- Instruments should be fitted with audible and visual alarms, situated appropriately to warn the operator of arrestment plant failure or malfunction.
- The activation of alarms should be automatically recorded.

- All continuous monitors should be operated, maintained and calibrated (or referenced, in the case of indicative monitors) in accordance with the manufacturers' instructions, which should be made available for inspection by the regulator.
- The relevant maintenance and calibration (or referencing, in the case of indicative monitors) should be recorded.
- Emission concentrations may be reported as zero when the plant is off and there is no flow from the stack. If required a competent person should confirm that zero is more appropriate than the measured stack concentration if there is no flow.
- Any continuous monitor used should provide reliable data >95% of the operating time, (i.e. availability >95%). A manual or automatic procedure should be in place to detect instrument malfunction and to monitor instrument availability.

Calibration and compliance monitoring

4.25 For extractive testing the sampling should meet the following requirements:

- For batch processes, where the production operation is complete within, say, 2 hours, then the extractive sampling should take place over a complete cycle of the activity.

4.26 Should the activity either be continuous, or have a batch cycle that is not compatible with the time available for sampling, then the data required should be obtained over a minimum period of 2 hours in total.

- For extractive testing, no result of monitoring should exceed the emission limit concentrations specified.

4.27 Exhaust flow rates should be consistent with efficient capture of emissions, good operating practice and meeting the requirements of the legislation relating to the workplace environment.

- The introduction of dilution air to achieve emission concentration limits should not be permitted.

Varying of monitoring frequency

- 4.28 Where non-continuous quantitative monitoring is required, the frequency may be varied. Where there is consistent compliance with emission limits, regulators may consider reducing the frequency. However, any significant process changes that might have affected the monitored emission should be taken into account in making the decision.
- 4.29 When determining “consistent compliance” the following are cases which might not qualify for a reduction in monitoring:
- variability of results: cases where monitoring results vary widely and include results in the range 30-45mg/m³ (when the emission limit is 50mg/m³).
 - the margin between the results and the emission limit: cases where results over a period are 45mg/m³ or more (when the emission limit is 50mg/m³).

Consistent compliance should be demonstrated using the results from at least;

- three or more consecutive annual monitoring campaigns; or
- two or more consecutive annual monitoring campaigns supported by continuous monitoring.

Where a new or substantially changed process is being commissioned, or where emission levels are near to or approach the emission concentration limits, regulators should consider increasing the frequency of testing.

- 4.30 A reduction in monitoring frequency should not be permitted where continuous quantitative or indicative monitoring is required. These types of monitoring are needed to demonstrate at all times when the plant is operating, that either the emission limits are being complied with or that the abatement equipment is functioning correctly.

Monitoring of unabated releases

- 4.31 Where emission limit values are consistently met without the use of abatement equipment, the monitoring requirement for those pollutants should be dispensed with subject to the “Varying of monitoring frequency” paragraphs above.

Where monitoring is not in accordance with the main procedural requirements of the relevant standard, deviations should be reported.

Representative sampling

- 4.32 Whether sampling on a continuous or non-continuous basis, care is needed in the design and location of sampling systems, in order to obtain representative samples for all release points.
- Sampling points on new plant should be designed to comply with the British or equivalent standards, (see paragraph 4.2).
 - The operator should ensure that relevant stacks or ducts are fitted with facilities for sampling which allow compliance with the sampling standards.

5. Control techniques

Summary of best available techniques

- 5.1 **Table 5.1** provides a summary of the best available techniques that can be used to control the process in order to meet the emission limits and provisions in **Section 4**. Provided that it is demonstrated to the satisfaction of the regulator that an equivalent level of control will be achieved, then other techniques may be used.
- 5.2 The process is largely carried out in process equipment and hence good equipment design, materials handling and spillage prevention can greatly reduce the volumes of air necessary for odour containment by avoiding odour release into the building. However, the containment of potentially odorous emissions is the key to effective control.
- 5.3 The following are examples of relevant odour control techniques:
- containment of odours within process buildings by good design and extract ventilation
 - good housekeeping and raw material handling practices
 - containment of odours within process equipment by maintaining material handling and storage facilities leakproof and spillproof as far as possible
 - control and minimisation of odours from residual materials, effluent and waste
 - containment of strong odour sources and treatment in odour control equipment.

Table 5.1 - Summary of control techniques

Release source	Substance	Control techniques
Raw material, effluent and waste storage	Odour	<p>Within buildings under negative pressure and vented to odour arrestment plant</p> <p>Within enclosed silos, tanks, containers or stored under negative pressure and vented to odour arrestment plant</p> <p>Refrigeration of animal, bird and fish raw materials unless used within 12 hours of arrival at site</p> <p>Spillage management including tank level management</p>
Loading and unloading processes	Odour	Enclosed vehicles and containers
Cooking process	Odour	<p>Within buildings under negative pressure and vented to odour arrestment plant</p> <p>Spillage management</p> <p>Appropriate construction</p> <ul style="list-style-type: none"> • impervious and easy to clean surfaces
Vehicles	Odour	Washing of vehicle surfaces (material contact) within buildings as above.
Ventilated air	Odour	<p>Vent to suitable arrestment plant</p> <ul style="list-style-type: none"> • biofilters • thermal oxidisers/combustion plant • scrubbers • located to take account of sensitive receptors
Waste gas from odour arrestment plant	Odour	Final dispersion to ensure no offensive odour at sensitive receptors
	Sulphur oxides	Limit sulphur in fuel
	Carbon monoxide	Good combustion
Raw material storage	Particulate matter	Potentially dusty materials should be stored in buildings or appropriate containers
Silos	Particulate matter	<p>Process control especially on delivery</p> <p>Dust arrestment</p> <ul style="list-style-type: none"> • bag filters • cartridge filters
Cooking and cooling process	Particulate matter	<p>Process control</p> <p>Spillage management</p> <p>Dust arrestment</p> <ul style="list-style-type: none"> • bag filters • cartridge filters

Techniques to control emissions from contained sources

- 5.4 Emissions from the process operations covered by this note comprise odours of mixed chemical species. The main principles for preventing odour emissions are;
- containment of the odours in the process equipment,
 - raw material handling operations (as detailed below); **and**
 - final treatment by arrestment of odour emissions.
- 5.5 Containment is achieved by ensuring that all operations with potential releases are carried out within enclosed equipment under a slight negative pressure and other fugitive odours are controlled by building extract ventilation.
- 5.6 Ventilation should be provided to maintain an adequate negative pressure within the process equipment (including tanks and vessels for holding dryer/cooker condensate) to contain process releases within the equipment during process operation. The required ventilation rate will depend upon many factors (such as environmental conditions, dryer design, raw material quality, effectiveness of process containment). Containment of emissions within the process equipment should prevent fugitive releases. The ventilation equipment should be vented to odour arrestment plant to meet the provisions of **Table 4.1**.
- 5.7 The production of pet food by steam sterilisation in hermetically sealed packs will greatly reduce odorous emissions.
- 5.8 Suitable odour arrestment plant should be provided and operated at all times, to meet the provisions of **Table 4.1**. Examples of the type of arrestment plant which are suitable include biofilters, high efficiency biological scrubbers, multi-stage chemical scrubbers, thermal incinerators and other forms of combustion plant. In the case of drying, cooking and cooling processes in pet food manufacture, adsorption equipment is not anticipated to offer adequate odour removal due to the types of chemical species in the odour and the risk of odour breakthrough and re-entrainment.
- The process may produce emissions of differing odour intensity (building air and cooking odours) and it may be more effective to separate the odour streams and divert to different odour arrestment plant. High odour intensity emissions and those incondensable gases (such as cooking emissions) should be diverted to thermal oxidation/combustion or multi-stage scrubbers, whilst those of lesser odour intensity may be treated in a single stage scrubber or biofilter.

- It may be appropriate to provide a number of smaller biofilters rather than one large bed to achieve more even gas flows throughout the filter. This will also provide standby facilities in case of breakdown or failure of one bed if the biofilter capacity is designed for this purpose.
- The presence of water vapour in the emissions from cooking processes can adversely affect the operation of the odour control equipment and the condensable gases present have a significant odour. The water vapour will usually condense and this can lead to corrosion of materials of construction. Also in the case of scrubbing equipment, the condensation of significant volumes of water vapour will result in continuous liquid overflow and dilution of the scrubbing liquor. Where wet scrubbing systems are used the emissions from cooking operations should be condensed (for example by the use of a spray tower or quench scrubber) prior to odour treatment of the non-condensable gases. The use of condensers is recommended for all odour arrestment plant.

5.9 Where odour arrestment plant is required it needs to be optimised to meet the odour destruction efficiency provisions of **Table 4.1**. Depending upon the type of arrestment plant used, this optimisation will include the following:

- In the case of thermal oxidisers or combustion equipment the operating temperature of the system will need to be maintained above 1123K (850°C). In the case of boilers, care is needed in their use for odour arrestment as the operating temperature and residence time may not have been designed for odour arrestment and there is the potential for quenching in the boiler. In addition, a minimum firing rate for the boiler to ensure that the boiler conditions are always optimised for odour removal should be established. The measurement of odour arrestment efficiency of the boiler can be used to demonstrate the correct operating parameters of the boiler.
- In the case of scrubbing equipment, it is likely that multi-stage scrubbing will be necessary to meet the odour destruction efficiency provisions of **Table 4.1**. In order to optimise the performance of the scrubber, it is important to ensure that it is well designed (adequate gas/liquid contact), well maintained, that the odours are sufficiently reactive with the scrubbing liquor to remove the odour and also that the reaction products do not themselves produce a volatile odour. In addition, additives to the liquor need to be automatically dosed with control by pH/Redox (over-dosing can lead to secondary odours from the scrubber associated with the chemical reagent). The scrubber will require regular inspection to identify possible blockage by salts which are typically formed when treating emissions from boiled green offal processes.

- If a bioscrubber is used, it is important to ensure that it is well designed (adequate gas/liquid contact), well maintained and that potential odours from scrubbing liquor are well managed. The scrubber will require regular inspection to identify possible blockage by biomass. In addition the pH of the liquor will need to be controlled as the microbial activity of the biomass will be adversely affected by high alkalinity (which is a potential problem with emissions from certain pet food manufacturing processes).
- Mist eliminators should be fitted where droplet emissions occur and, in relation to new or replacement scrubbing plant, where there is a potential for such occurrence.
- Biofiltration can be undertaken using packaged, enclosed biofilters or open biomass (such as peat/heather). If a peat and heather biofilter is used, it is essential to control the pH of the biomass as the microbial activity will be adversely affected by high alkalinity (which is a potential problem with the high levels of ammonia). In this case it may be necessary to pre-treat the emissions for example by water scrubbing (this will also have the beneficial effect of humidifying the air). In order to optimise the performance of the biofilter, the biomass must be maintained typically between 30°C and 40°C, must be kept moist, must have a gas flow at all times and leakage through edges and fissures must be avoided. Biofilters will require regular treatment to overcome consolidation - this may be regular surface turning or deconsolidation by digging- out the bed.
- The required residence time for the biofilters will depend upon many design conditions and will have to be sufficient to meet the provisions of paragraph 4.7. However the recommended residence time (also known as empty bed contact time) for peat and heather filters is a minimum of 60 seconds for lower intensity odours.
- The use of odour masking agents and counteractants should not be permitted (other than as a scrubber liquor additive).

Particulate matter

- 5.10 In the case of emissions which are both odorous and contain particulate matter, it may be necessary to treat the releases from the particulate matter arrestment plant to remove the odour before final dispersion of residual odour.
- Emissions of particulate matter from grinders, dryers and coolers should be contained, extracted and arrested if necessary to meet the visible emission provisions or the limits described in **Table 4.1** for particulate matter.
 - The methods of removal of collected particulate matter from arrestment plant should be undertaken carefully to avoid re-entrainment of dust.

- The removal of collected particulate matter from the filter housing should preferably be an automated operation into an enclosed container for disposal.
- Where the particulate matter arrestment plant includes a rotary valve, the potential for blockage of the valve or hopper should be continuously monitored and alarmed (for example by the use of a rotation sensor on the rotary seal or a level indicator in the hopper).

Silos (where there is pneumatic delivery of materials)

- 5.11 The silo management system includes the high level alarms, abatement plant and pressure relief device. If best practice is being applied then any failure of the silo management system leads to full investigation of the operation of the plant and equipment. Continuous high level monitoring systems are currently available for use in storage silos. They may be used telemetrically to monitor stock within the silo. They may also be used to automatically stop delivery of material to the silo. It is expected that such systems will become more widely used in the future.
- 5.12 Careful delivery by trained personnel will avoid materials being blown into silos at a rate which is likely to result in pressurisation of the silo, especially towards the end of the delivery when the quantity of material entering the ducting is reduced. If deliveries are accepted from tankers without on board relief valve and filtration systems, particular care to avoid pressurisation of silos when venting air through the silo at the end of the delivery is needed.
- 5.13 The following measures relating to arrestment plant on silos and other silo management techniques are only applicable where the silo vents to the external environment or where silo emissions may escape from inside a building into the external environment.
- All dusty or potentially dusty materials should be stored in silos, in confined storage areas within buildings, or in fully enclosed containers / packaging. Where the storage is open within a building, then suitable precautions should be taken to prevent wind whipping.
 - When delivery to a silo or bulk storage tank takes place, displaced air should either be vented to suitable arrestment plant (for example cartridge/bag filters) or back vented to the delivery tanker, in order to minimise emissions. Arrestment plant fitted to silos should be of sufficient size (and kept clean) to avoid pressurisation during delivery.
 - In order that fugitive emissions are minimised during the charging of silos, transfer lines should be securely connected to the silo delivery inlet point and the tanker discharge point, in that order. Tanker drivers should be informed of the correct procedures to be followed.

- Bulk storage tanks and silos containing dry materials should be equipped with audible and/ or visual high level alarms, or volume indicators, to warn of overfilling. The correct operation of such alarms should be checked in accordance with manufacturers' instructions. If manufacturers' instructions do not specify, then the check should be weekly or before a delivery takes place, whichever is the longer interval.
- If emissions of particulate matter are visible from ducting, pipework, the pressure relief device or dust arrestment plant during silo filling, the operation should cease; the cause of the problem should be rectified prior to further deliveries taking place. Tanker drivers should be informed of the correct procedure to be followed.
- Seating of pressure relief devices on silos should be checked at least once a week, or before a delivery takes place, whichever is the longer interval.
- Immediately it appears that the device has become unseated during silo filling, no further delivery should take place until corrective action has been taken. The pressure relief device should be examined to check for defects before being re-set and a replacement fitted if necessary. Tanker drivers should be informed of the correct procedure to follow.
- Deliveries to silos from road vehicles should only be made using tankers with an on-board (truck mounted) relief valve and filtration system. This means that venting air from the tanker at the end of a delivery will not take place through the silo. Use of alternative techniques may be acceptable provided that they achieve an equivalent level of control with regard to potential for emissions to air.
- Care should be taken to avoid delivering materials to silos at a rate which is likely to result in pressurisation of the silo. If compressed air is being used to blow powder into a silo then particular care is required towards the end of the delivery when the quantity of material entering the ducting is reduced and hence the air flow is increased.
- All new silos should be fitted with an automatic system to cut off delivery in the event of pressurisation or overfilling. Use of alternative techniques may be acceptable provided that they achieve an equivalent level of control with regard to potential for emissions to air.

Techniques to control fugitive emissions

Materials handling – prevention of odour

- 5.14 Ensuring that raw materials are processed before significant deterioration occurs can reduce odour generation throughout the process. The emission of odours from raw material handling and storage operations can be effectively managed by control of the time that raw materials are held at ambient temperature and control of storage temperature (freezing or refrigeration) to reduce material deterioration.
- 5.15 All animal matter should be transported from the source of arising to the processing site as quickly as practicable. The design and use of vehicles and containers should be such as to prevent the emission of any offensive odour or substance prescribed for air. Totally enclosed containers or vehicles should be used for the collection of animal matter.
- 5.16 The movement of raw materials in a refrigerated or frozen state is preferable.
- Pallets on which unprocessed materials are stored should be constructed from impervious materials which are capable of being readily cleaned - for example, plastic or stainless steel - where they may come into contact with blood or liquids or unfrozen solids from raw materials. Wooden pallets should be accepted where the material is retained in a frozen state.
 - For the purpose of this note frozen means having a core temperature of less than 263K (-10°C), free from visible surface liquid and showing no signs of defrosting. All contaminated pallets should be handled in accordance with paragraph 5.20.
 - Raw material should be subjected to temperature control to less than 278K (5°C) within one hour of arriving at the process site. It may be appropriate to relax this provision for certain raw materials where, because of the following factors, the potential for offensive odour is reduced:
 - temperature, appearance and freshness on delivery;
 - the nature of the raw material (for example, bone);
 - the time elapsed from the time of slaughter;
 - how quickly the material will be processed.
 - All vehicles, containers, trailers, tarpaulins and equipment used for the collection, transfer and handling of the aforementioned raw materials and for holding waste should be readily cleansable, impervious and kept clean. The vehicles and containers should be covered to prevent emissions.

- Empty vehicles and containers should be thoroughly cleaned as soon as possible after delivery of raw materials in a designated area.
- Raw material (other than frozen material) should be received in an enclosed hopper, tank, silo or designated enclosed area, and where appropriate stored prior to processing. Storage should be in enclosed silos, enclosed stores or in containers in ventilated areas of the processing building.
- Frozen materials (as defined above) should be permitted to be stored outside an enclosed area or vehicle for the purpose of transfer between enclosed areas, cold stores and vehicles. In such circumstances the frozen material should not be permitted to defrost or release liquid or an offensive odour and in no case should be outside for more than 60 minutes. In addition, the material should be protected from any heat source, including sunlight. Where, in exceptional circumstances, the period is greater than 60 minutes, the material should be stored in an enclosed, covered, leakproof container.
- All tanks for liquid material storage should be fitted with level indicators or high level alarms to warn of potential overfilling (it may be acceptable to rely upon regular dipping of the tanks associated with a documented material transfer protocol). All such tanks should be vented to odour arrestment plant where necessary to meet the provisions of paragraph 4.7.

5.17 Adequate provision should be made for the containment of liquid and solid spillages.

- All spillages should be cleared as soon as possible and in the case of solid materials, this should be achieved by the use of vacuum cleaning, wet methods or other appropriate techniques.

Materials handling – prevention of particulate emissions

5.18 The operator should ensure the following:

- Dry sweeping of dusty spillages should not be permitted in circumstances where it may lead to the deposition of dust outside the site boundary.
- All dusty, or potentially dusty; materials should be stored in covered containers, sealed bags or purpose built silos.
- The bulk transfer of dry raw materials, other than delivery to site storage, should be by suitable mechanical handling systems - for example, screw feeder, gravity or pneumatic means.
- All internal transport of dusty materials should be carried out to prevent, or where prevention is not practicable, minimise air borne dust emissions.

- Where conveyors are used they should be of sufficient capacity to handle maximum loads.
- External conveyor discharges should be arranged to minimise free fall at all times.
- Where necessary, in order to minimise emissions of dust, extraction should be provided from transfer points to arrestment plant - for example, a bag filter.

Good hygiene for odour control

- 5.19 European regulations laying down health rules as regards animal by-products and derived products not intended for human consumption, (Regulation (EC) 1069/2009 and the accompanying implementing Regulation (EC) 142/2011) apply to this sector and are enforced for reasons other than odour control.

Animal by-products legislation is not a reason for including conditions in a permit issued using this guidance note; however the effect of the animal by-products controls assist considerably in odour control for pet food manufacturing processes. Inclusion of detailed hygiene conditions in the permit for odour control reasons is not usually required.

Building construction to prevent odorous emissions

- 5.20 All internal surfaces of all buildings where raw materials are received, transferred or processed and all surfaces and equipment liable to come into contact with raw or processed material should be impervious, capable of being readily cleansed and should be kept clean.
- All floors of animal material reception, storage and processing areas, yards and designated vehicle or container cleaning areas should be of impervious construction laid to fall to trapped drainage inlets. Drains should be provided where necessary, with sedimentation tanks and interceptors to prevent the transmission of material likely to impair the free flow of any receiving sewerage system.
 - Buildings should be constructed of suitable materials (for example brick or concrete walls and sealed metal sheet roofing) and the integrity of the buildings should be regularly inspected and maintained to prevent the uncontrolled escape of air from the raw material receipt, processing and storage areas. All doors for personnel access and egress should be self-closing and doors for vehicle access should only be opened to allow vehicles to enter or exit.

- Areas of the building into which vehicles enter should be of sufficient size to accommodate the whole vehicle, including lowered tailgates, and to allow doors to close once the vehicle is inside the building. In addition, consideration should be given to the installation of an airlock where necessary to ensure compliance with paragraph 4.7 during vehicle access or off-loading.
- Doors may be kept open during the delivery of raw materials to a hopper or storage area subject to the provision of adequate exhaust ventilation to odour arrestment plant to meet the provisions of paragraph 4.7.
- Where vehicle access doors are automatically operated, an audible alarm should sound when the door is open to warn of the potential for odour escape.

Process operations

5.21 Process operations should be carried out to minimise releases of odour.

- Process tanks, cookers, coolers, dryers and vessels should be enclosed to minimise emissions and where necessary should be provided with a containment and collection system for steam, condensate and odorous emissions. Full enclosure of certain continuous belt pre-cookers is not possible and in such cases emissions should be contained by the use of extract ventilation.
- Provision should be made for effective and rapid cleaning of any area of spillage. High pressure jetting, steam-cleaning or mechanical cleaning with foaming chemical systems are effective methods of cleaning and, where used, sufficient hosing points should be made available. Spillages should be contained and cleared as soon as reasonably practicable.

5.22 Maintaining the process equipment leak-proof and under negative pressure is the most effective method of containment of odours.

- Ventilation should be provided to maintain an adequate negative pressure within the raw material reception and storage areas, processing areas and product storage areas, where necessary, to meet the provisions of paragraph 4.7. The ventilation equipment should be vented to suitable arrestment plant.

As regards the exhaust flow rate within the building, attention is drawn to the need to ensure compliance with the requirements of the legislation and standards applicable to the workplace environment, particularly with respect to occupational exposure limits.

- Where the packing of dry pet food into bags necessitates the use of local exhaust ventilation, suitable arrestment plant, for example bag filters, should be installed to minimise emissions of dust.

- The on-site transfer of raw materials to the processing plant should be undertaken in a manner to prevent spillage and minimise disturbance of material. The material transfer method should be suitable for the raw materials handled and the final use of the material - for example, small-scale and infrequent material handling may be by containers or bins, and in other cases slurries should be pumped and finely divided materials moved by gravity; screw auger or pneumatic means.
- Where it is necessary to use conveyors, for example, to facilitate visual inspection of raw materials, they should be of sufficient capacity to handle maximum loads without spillage. All transfer points should be leakproof.
- All necessary precautions should be taken to prevent odorous emissions during defrosting of raw material, for example by containment of liquid released during defrosting and discharging to suitable trapped drainage inlets or contained within the process equipment.

5.23 Good housekeeping should be practised at all times. The adoption of good cleaning and working practices as a routine will reduce process odour emissions and consequently lead to higher nominal arrestment plant efficiency.

- A proper cleaning programme should be instituted. This should cover all structures, equipment and internal surfaces and containers used for animal, bird and fish matter processing and collection and waste storage.
- The cleaning and disinfecting of all drainage areas and collecting tanks, yards and roads should be undertaken regularly and at least once a week.
- The cleaning of pumped and other fully enclosed systems, when used with unprocessed animal materials, should be carried out as soon as possible after pumping has finished or the vessel has been emptied, and should usually be undertaken within three hours of the completion of pumping or vessel emptying.

Effluent and waste – odour control

5.24 The effluent produced has the potential to generate a significant odour. All effluent should therefore be carefully handled and treatment should be carried out in a manner which will minimise the emission of offensive odours and will render any emission inoffensive and harmless.

- All effluent arising outside buildings that contain processing and treatment plant should be drained via interceptor traps to the normal sewerage system or to an effluent treatment plant or storage tank.
- All effluent arising within buildings including floor washings should be drained to an effluent treatment plant or storage tank.

- Any waste material which is minced on-site and discharged with effluent should not be discharged to the normal sewerage system but should be discharged to an effluent treatment plant or storage tank.
- All effluent storage tanks should be vented to suitable odour arrestment plant where necessary to meet the provisions of paragraph 4.7. A minimum extracted air volume should be maintained to the tank at all times (depending upon the tank design it may be necessary to isolate the tank from the odour arrestment plant during emptying to avoid tank damage). Care should be taken in emptying the effluent tanks to minimise odour release - consideration should be given to venting the collecting tanker to the odour arrestment plant.
- All effluent storage tanks should be emptied regularly.
- All effluent tanks should be fitted with level indicators or high level alarms to warn of potential overflowing.
- All tanks and effluent storage systems including cesspits and septic tanks should be adequately covered and effluent treatment systems should be properly maintained in accordance with the maintenance programme included in the odour response procedure (**Appendix 3**).
- All effluent tanks should be protected by a bund to contain spillages and the tanker connection point should also be provided with bunding or spillage containment kerbs. Provision should be made for effective and rapid cleaning of any area of spillage. High pressure jetting or steam-cleaning are effective methods of cleaning and, where used, sufficient hosing points should be made available. Spillages should be contained and cleared immediately.

- 5.25 All animal waste and any other waste (including pallets and packaging materials) which may lead to the emission of offensive odours should be stored in enclosed skips, an enclosed store or within the process building. In all cases, waste should be removed from the process site frequently and at least every 48 hours. Storage areas for such skips should be located away from direct sunlight or heat sources. Dewatering of waste will reduce odorous solid waste and reduce emissions of offensive odour.
- The storage area should be provided with extract ventilation to suitable arrestment plant where necessary to meet the provisions of paragraph 4.7.
 - All waste should be removed as soon as the waste container is full and at least once per week. High odour intensity waste should be moved more frequently where necessary to ensure compliance with paragraph 4.7.
 - Waste should not be moved from process buildings to another building or outside unless in sealed containers. (Covered skips should not be regarded as sealed containers).

Odour response procedure

- 5.26 The operator should prepare an odour response procedure as outlined in **Appendix 3**. This is a summary of the foreseeable situations which may compromise his/her ability to prevent and/or minimise odorous releases from the process and the actions to be taken to minimise the impact. It is intended to be used by operational staff on a day-to-day basis and should detail the person responsible for initiating the action.
- The odour response procedure should include a list of essential spares for the odour control equipment. The equipment manufacturer should recommend which spares are subject to wear and foreseeable failure and are critical for the correct operation of the odour arrestment plant (such as pumps, nozzles etc.) and these should be held on site. It may be acceptable for certain spares to be available on guaranteed short delivery if the absence of a supply at the site would not lead to complete failure of the odour arrestment plant or to offensive odours beyond the site boundary.

5.27 The odour response procedure should include analysis of actions in the case of arrestment plant breakdown or malfunction. Immediate arrangements should be made to divert odour streams to other suitable arrestment plant. Failure to provide suitable temporary arrestment plant may lead to the suspension of the process and consequently emergency standby arrangements should be detailed in the odour response procedure. This may include:

- suspending process operations;
- reducing the scale of high odour intensity process operations, for example stopping cooking operations or reducing throughput;
- by-pass emissions to stand-by or alternate odour arrestment plant, for example using a boiler as an emergency odour arrestment system.

Air quality

Dispersion & dilution

5.28 Pollutants that are emitted via a stack require sufficient dispersion and dilution in the atmosphere to ensure that they ground at concentrations that are deemed harmless. This is the basis upon which stack heights are calculated using HMIP Technical Guidance Note (Dispersion) D1. The stack height so obtained is adjusted to take into account local meteorological data, local topography, nearby emissions and the influence of plant structure.

The calculation procedure of D1 is usually used to calculate the required stack height but alternative dispersion models may be used in agreement with the regulator. An operator may choose to meet tighter emission limits in order to reduce the required stack height.

5.29 Where an emission consists purely of air and particulate matter, (i.e. no products of combustion or any other gaseous pollutants are emitted) the above provisions relating to stack height calculation for the purpose of dispersion and dilution should not normally be applied. Revised stack height calculations should not be required as a result of publication of this revision of the PG note, unless it is considered necessary because of a breach or serious risk of breach of an EC Directive limit value or because it is clear from the detailed review and assessment work that the permitted process itself is a significant contributor to the problem.

5.30 Where offensive odour is likely outside the process site boundary the assessment of stack or vent height should take into account the need to render harmless residual offensive odour.

Ambient air quality management

- 5.31 In areas where air quality standards or objectives are being breached or are in serious risk of breach and it is clear from the detailed review and assessment work under Local Air Quality Management that the permitted process itself is a significant contributor to the problem, it may be necessary to impose tighter emission limits. If the standard that is in danger of being exceeded is not an EC Directive requirement, then industry is not expected to go beyond BAT to meet it.

Decisions should be taken in the context of a local authority's Local Air Quality Management action plan. For example, where a permitted process is only responsible to a very small extent for an air quality problem, the authority should not unduly penalise the operator of the process by requiring disproportionate emissions reductions. Paragraph 59 of the [Air Quality Strategy 2007 \[Volume 1\]](#) gives the following advice:

“...In drawing up action plans, local authority environmental health/pollution teams are expected to engage local authority officers across different departments, particularly, land-use and transport planners to ensure the actions are supported by all parts of the authority. In addition, engagement with the wider panorama of relevant stakeholders, including the public, is required to ensure action plans are fit-for-purpose in addressing air quality issues. It is vital that all those organisations, groups and individuals that have an impact upon local air quality, buy-in and work towards objectives of an adopted action plan.”

Stacks, vents and process exhausts

- 5.32 Liquid condensation on internal surfaces of stacks and exhaust ducts might lead to corrosion and ductwork failure or to droplet emission. Adequate insulation will minimise the cooling of waste gases and prevent liquid condensation by keeping the temperature of the exhaust gases above the dewpoint. A leak in a stack/vent and the associated ductwork, or a build up of material on the internal surfaces may affect dispersion:
- Flues and ductwork should be cleaned to prevent accumulation of materials, as part of the routine maintenance programme.
- 5.33 When dispersion of pollutants discharged from the stack (or vent) is necessary, the target exit velocity should be 15m/s under normal operating conditions, however, lower velocities than 15m/s are acceptable provided adequate dispersion and dilution is achieved (see also the paragraph below regarding wet plumes). In order to ensure dispersion is not impaired by either low exit velocity at the point of discharge, or deflection of the discharge, a cap, or other restriction, should not be used at the stack exit. However, a cone may sometimes be useful to increase the exit velocity to achieve greater dispersion.

- 5.34 An exception to the previous paragraph is where wet arrestment is used as the abatement. Unacceptable emissions of droplets could occur from such plant where the linear velocity in the stack exceeds 9m/s.
- 5.35 To reduce the potential of droplet emissions a mist eliminator should be used. Where a linear velocity of 9m/s is exceeded in existing plant consideration should be given to reducing this velocity as far as practicable to ensure such droplet entrainment and fall out does not happen.

Management

Management techniques

- 5.36 Important elements for effective control of emissions include:
- proper management, supervision and training for process operations;
 - proper use of equipment;
 - effective preventative maintenance on all plant and equipment concerned with the control of emissions to the air; **and**
 - ensuring that spares and consumables - in particular, those subject to continual wear – are held on site, or available at short notice from guaranteed local suppliers, so that plant breakdowns can be rectified rapidly. This is important with respect to arrestment plant and other necessary environmental controls. It is useful to have an audited list of essential items.

Appropriate management systems

- 5.37 Effective management is central to environmental performance; it is an important component of BAT and of achieving compliance with permit conditions. It requires a commitment to establishing objectives, setting targets, measuring progress and revising the objectives according to results. This includes managing risks under normal operating conditions and in accidents and emergencies.

It is therefore desirable that installations put in place some form of structured environmental management approach, whether by adopting published standards (ISO 14001 or the EU Eco Management and Audit Scheme [EMAS]) or by setting up an environmental management system (EMS) tailored to the nature and size of the particular process. Operators may also find that an EMS will help identify business savings.

5.38 Regulators should use their discretion, in consultation with individual operators, in agreeing the appropriate level of environmental management. Simple systems which ensure that LAPPC considerations are taken account of in the day-to-day running of a process may well suffice, especially for small and medium-sized enterprises. Regulators are urged to encourage operators to have an EMS for all their activities, but it is outside the legal scope of an LAPPC permit to require an EMS for purposes other than LAPPC compliance. For further information/advice on EMS refer to the appropriate chapter of the appropriate Guidance Manual for [England and Wales](#), [Scotland](#) and [Northern Ireland](#).

Training

5.39 Staff at all levels need the necessary training and instruction in their duties relating to control of the process and emissions to air. In order to minimise risk of emissions, particular emphasis should be given to control procedures during start-up, shut down and abnormal conditions. Training may often sensibly be addressed in the EMS referred to above.

- All staff whose functions could impact on air emissions from the activity should receive appropriate training on those functions. This should include:
 - awareness of their responsibilities under the permit;
 - steps that are necessary to minimise emissions during start-up and shutdown;
 - actions to take when there are abnormal conditions, or accidents or spillages that could, if not controlled, result in emissions.
- The operator should maintain a statement of training requirements for each post with the above mentioned functions and keep a record of the training received by each person. These documents should be made available to the regulator on request.

Maintenance

5.40 Effective preventative maintenance plays a key part in achieving compliance with emission limits and other provisions. All aspects of the process including all plant, buildings and the equipment concerned with the control of emissions to air should be properly maintained. In particular:

- The operator should have the following available for inspection by the regulator:
 - a written maintenance programme for all pollution control equipment; and
 - a record of maintenance that has been undertaken.

6. Summary of changes

The main changes to this note, with the reasons for the change, are summarised in **Table 6.1**. Minor changes that will not impact on the permit conditions e.g. slight alterations to the Process Description have not been recorded.

Table 6.1 - Summary of changes

Section/ paragraph/ row	Change	Reason	Comment
Title page	Deleted references to “wet” and “dry” pet food	PG6/24a & 24/b have been combined into one note	The distinction between “wet” and “dry” products is not clear cut and often regulators refer to both notes for wet processes with particulate emissions and dry processes which have moved into products using raw animal protein.
Section 1: Introduction			
	Simplification of text	Make note clearer	
	Addition of links	Change to electronic format	Removes need for extensive footnotes/references
Paragraphs 1.6 & 1.7	Introductory text to the simplified permitting regime	New to Part B	
Section 3: Activity description			
Whole section	Process description text from previous PG6/24a&b combined	Revised note combines PG6/24a and PG6/24b	
Paragraph 3.4	Amended legislative reference relating to the disposal of certain animal by-products	Regulation 1069/2009 has repealed Regulation 1774/2002 (Animal by-products Regulation).	
Section 4: Emission limits, monitoring and other provisions			
Whole section	Used to be Section 5 in previous note	Section 4 in previous note deleted and potential emissions added into Section 3.	
Paragraphs 4.4 - 4.7	Amended text to explain approach to take to odorous emissions	Clarification of text	

Paragraphs 4.8 & 4.9 Visible Emissions	Revised text describing approach to take to visible emissions.	Allows more flexibility in managing visible emissions	
Section 5: Control techniques			
	Used to be Section 6 in previous note	Section 4 in previous note deleted leading to re-numbering of sections	
Paragraph 5.19	New text relating to good hygiene conditions	Prevents reiteration in the SP of hygiene conditions that are better covered via the ABP Regulations	
Air quality	Clarification of exhaust velocity requirements	Make note clearer	
Appendix 1			
	Inclusion of a new Appendix detailing a model simplified permit	Simplification of permitting process	
Appendix 2			
	Inclusion of a new Appendix detailing a model application form for a simplified permit	Simplification of permitting process	
Appendix 5			
	Imposing an odour boundary condition	Guidance text on OBC deleted from (old) Section 5 and added as an appendix	OBCs are not considered necessary for this PG note where process emissions are not normally considered to be as bad as rendering

7. Further information

Sustainable consumption and production (SCP)

Both business and the environment can benefit from adopting sustainable consumption and production practices. Estimates of potential business savings include:

- £6.4 billion a year UK business savings from resource efficiency measures that cost little or nothing;
- 2% of annual profit lost through inefficient management of energy, water and waste;
- 4% of turnover is spent on waste.

When making arrangement to comply with permit conditions, operators are strongly advised to use the opportunity to look into what other steps they may be able to take, for example, having regard to the efficient use of auxiliary fuels, such as gas and electricity. Regulators may be willing to provide assistance and ideas, although cannot be expected to act as unpaid consultants.

Health and safety

Operators of installations must protect people at work as well as the environment:

- requirements of a permit should not put at risk the health, safety or welfare of people at work or those who may be harmed by the work activity;
- equally, the permit must not contain conditions whose only purpose is to secure the health of people at work. That is the job of the health and safety enforcing authorities.

Where emission limits quoted in this guidance conflict with health and safety limits, the tighter limit should prevail because:

- emission limits under the relevant environmental legislation relate to the concentration of pollutant released into the air from prescribed activities;
- exposure limits under health and safety legislation relate to the concentration of pollutant in the air breathed by workers;
- these limits may differ since they are set according to different criteria. It will normally be quite appropriate to have different standards for the same pollutant, but in some cases they may be in conflict (for example, where air discharged from a process is breathed by workers). In such cases, the tighter limit should be applied to prevent a relaxation of control.

Further advice on responding to incidents

The UK Environment Agencies have published [guidance](#) on producing an incident response plan to deal with environmental incidents. Only those aspects relating to air emissions can be subject to regulation via a Part B (Part C in NI) permit, but regulators may nonetheless wish to informally draw the attention of all appropriate operators to the guidance.

It is not envisaged that regulators will often want to include conditions, in addition to those advised in this PG note, specifying particular incident response arrangements aimed at minimising air emissions. Regulators should decide this on a case-by-case basis. In accordance with BAT, any such conditions should be proportionate to the risk, including the potential for harm from air emissions if an incident were to occur. Account should therefore be taken of matters such as the amount and type of materials held on site which might be affected by an incident, the likelihood of an incident occurring, the sensitivity of the location of the installation, and the cost of producing any plans and taking any additional measures.

Appendix 1 - Model Permit

This Appendix contains a model permit for pet food manufacturing installations – see [insert relevant para from introduction] of this note and paragraph 3.6 of the [General Guidance Manual on Policy and Procedures](#).

Notes:

- text in the model permit written in *italics* is advice to regulators.
- text in the model permit in [square brackets] offers choice to regulators or indicates where information needs to be inserted from the application;
- text bracketed with asterisks (eg *Alarms shall be tested at least once a week*.) may be omitted by a regulator where the past performance of the plant gives the local authority sufficient reassurance about operator compliance – “earned recognition”;
- the model permit has been drafted for local authorities in England and Wales. Regulators in Scotland and Northern Ireland will need to amend the legal heading and, where appropriate, references to ‘Council’;
- references to ‘installation’ will need to be substituted with ‘mobile plant’ in relevant cases, and other amendments made accordingly;
- the purpose of the activity description is to set down the main characteristics of the activity, including any directly associated activities, so it is clear to all concerned what is being authorised by the permit and therefore what changes would need further approval. Regulators are advised to include a description of any key items of abatement and monitoring equipment the operator intends to use or is using;
- it should normally be sufficient for records relating to simplified permits to be kept until the next inspection or for 24 months whichever is the longer.

[] COUNCIL
POLLUTION PREVENTION AND CONTROL ACT 1999
Environmental Permitting Regulations 2010 (as amended)

Permit ref. no:

Name and address of person (A) authorised to operate the installation ('the operator'):

Registered number and office of company: (if appropriate)

Address of permitted installation (B)

The installation boundary and key items of equipment mentioned in permit conditions are shown on the plans attached to this permit.

Activity description

Conditions

The operator (A) is authorised to operate the activity¹ at the installation (B) subject to the following conditions.

1. The operator shall: *delete first bullet point if condition 2 (odour boundary condition) is deleted from this simple permit*
 - [prevent offensive odour beyond the site boundary as perceived by the regulator (see condition 2)]
 - contain processing operations within a building and prevent the release of uncontrolled emissions
 - extract odorous air
 - treat extracted air in odour abatement plant
 - maintain a written odour response plan

Emissions

Note to permit writers: is odour particularly offensive (relative to animal rendering) AND is there abatement plant on site? Where odour may be deemed offensive but there is no abatement plant on site – suggest OBC (condition 2) is omitted from this simple permit.

2. There shall be no offensive odour beyond the site boundary as perceived by the regulator. It shall not be a breach of this condition in a particular case if the operator can show that they took all reasonable steps and exercised all due diligence to prevent the release of offensive odour.
3. No visible particulate matter shall be emitted beyond the installation boundary.

Buildings, ventilation

4. Buildings containing processing operations shall: *(delete bullets that do not apply)*
 - prevent the uncontrolled release of air from raw materials receipt, processing and storage.
 - [maintain a [negative pressure]/[chilled atmosphere] inside raw materials reception and storage areas of the building];
 - have a designated area for loading raw material wastes into vehicles, and shall collect air and exhaust it to the odour abatement plant;
 - [be large enough for raw material delivery vehicles to be unloaded inside closed doors]
 - [personnel doors shall be self-closing]

[Odour abatement plant *(delete condition if no odour abatement plant serves the activity)*

5. The operator shall ensure that:
 - collected air is discharged through odour abatement plant;]

¹ listed in [] in Part 2 of Schedule 1 to the Environmental Permitting Regulations

6. *Where odour abatement equipment is installed:* [The odour abatement equipment shall be inspected not less than once a day for at least the following:
- leaks or blockages in air handling equipment, ductwork and abatement equipment;
 - continuous monitors for abatement equipment; **and**
 - surface cracking, voids, leaks, compaction, moisture content, and plant/weed growth on biofilters].

Processing

7. Process tanks and vessels shall:
- be loaded to minimise spillage and disturbance to materials; and
(delete one of these two bullets according to answers in Application form)
 - be fully enclosed and fitted with [level indicators/high level alarms] and have emissions collected; [except for *list of open tanks and vessels*, for which emissions shall be captured and collected];
 - have emissions captured and collected [except for *list enclosed tanks and vessels*, which shall be fully enclosed and fitted with [level indicators/high level alarms].

Good hygiene for odour control *(delete bullets and conditions that do not apply)*

For the purposes of condition 8 only, the phrase “raw materials” is taken to mean “previously unprocessed animal protein”.

8. To minimise emissions of odour, the operator shall ensure that:
- the buildings, equipment and containers that hold raw materials and waste raw materials can be, and are, cleaned effectively, and are kept in good condition;
 - liquids drain appropriately;
 - raw materials are unloaded and stored appropriately;
 - waste raw materials are stored appropriately;
 - vehicles and containers are cleaned appropriately;
 - vehicles and containers in contact with raw materials shall be cleaned within the designated delivery area as soon as possible after delivery;
 - vehicles containing raw materials shall only be parked within the designated delivery area(s)
9. [During defrosting necessary precautions shall be taken to prevent odorous emissions]

Effluent and Wastes capable of causing an odour

10. Cesspits, effluent storage tanks and septic tanks shall be adequately covered.
- [They and the waste storage and the collecting tanker shall be continuously vented to odour abatement plant].
 - [Effluent tanks should be fitted with level indicators or high level alarms to warn of potential overfilling].
11. Waste shall be removed frequently and at least once a week. When waste is moved between buildings, and when it is outdoors, it shall be in sealed containers.

Silos and bulk tanks where pneumatic transport is used

12. Materials delivered by pneumatic transport shall only be stored within [xxxxxx] silos. Silos and bulk containers of dusty materials shall not be overfilled and there shall be an overfilling alarm. When loading [xxxx] silos, ensure delivery is at a rate which does not pressurise the silo. [For silos, new or replacement plant since August 2006, deliveries must stop automatically where over-pressurisation or over-filling is identified]. Displaced air from pneumatic transfer shall pass through abatement plant prior to emission to air.

Other bulk, loose, dry material - storage and loading and transport around site

13. Dusty materials (including dusty wastes) shall only be stored in [*specify storage locations*] as detailed on the plan attached to this permit and their storage and transfer shall be subject to suppression and management techniques to minimise dust emissions. No potentially dusty materials (including wastes) or finished products shall leave the site other than by use of [*specify transport type and dust control technique*].

(delete condition 14 if not applicable, or adapt to type of conveyors/transport on site)

14. All dusty materials, including wastes, shall be [conveyed] [transferred] using [*specify type of transport or conveyor, level of enclosure and enclosure type*]. All transfer points shall be fitted with [*specify dust control technique*].

Monitoring provisions

15. The emission requirements and methods and frequency of monitoring set out in **Table 1** shall be complied with. Sampling shall be representative.
16. All continuous monitors fitted to show compliance with the permit shall be fitted with a [visible] [audible] alarm warning of abatement failure or malfunction. They shall [activate when emissions reach [75%] of the relevant emission limit in Table 1 and] record automatically each activation. *Alarms shall be tested at least once a week.*
17. The operator shall, in the case of abnormal emissions, inform the regulator without delay if there is an emission likely to have an effect on the local community.
18. Any monitoring display required for compliance with the permit shall be visible to operating staff at all times. Corrective action shall be taken immediately if any periodic monitoring result exceeds a limit in **Table 1**, or if there is a malfunction or breakdown of any equipment which might increase emissions. Monitoring shall be undertaken or repeated as soon as possible thereafter and a brief record shall be kept of the main actions taken.
19. All plant and equipment capable of causing, or preventing, emissions and all monitoring devices shall be calibrated and maintained in accordance with the manufacturer's instructions. *Records shall be kept of such maintenance*.

Records and training

20. Written or computer records of all tests and monitoring shall be kept by the operator until the next inspection, or for at least [24] months whichever is the longer. They shall be made available for examination by the regulator. *Records shall be kept of operator inspections, including those for odorous emissions.*
21. Staff at all levels shall receive the necessary training and instruction to enable them to comply with the conditions of this permit. *Records shall be kept of relevant training undertaken*.

The following two conditions are not needed for PPC permits which transferred automatically into the environmental permitting regime by virtue of regulation 69(6) of the 2007 Regulations and regulation 108(4) of the 2010 Regulations. Where permits are issued on or after 6 April 2008 the conditions will not automatically apply and need specific inclusion in the permit where required.

Best available techniques

22. The best available techniques shall be used to prevent or, where that is not practicable, reduce emissions from the installation in relation to any aspect of the operation of the installation which is not regulated by any other condition of this permit.
23. If the operator proposes to make a change in operation of the installation, he must, at least 14 days before making the change, notify the regulator in writing. The notification must contain a description of the proposed change in operation. It is not necessary to make such a notification if an application to vary this permit has been made and the application contains a description of the proposed change. In this condition 'change in operation' means a change in the nature or functioning, or an extension, of the installation, which may have consequences for the environment.

Permit writer to delete rows that do not apply

Table 1 - Emission limits, monitoring and other provisions

Row	Substance	Source	Emission limits/provisions	Type of monitoring	Monitoring frequency
1	Odour	Contained High Odour Intensity process releases	Where installed any odour arrestment plant installed on high odour intensity emissions should have an odour removal efficiency of not less than 95% (see also note g).	Determination by manual extractive sampling and analysis by dynamic olfactometry in accordance with BS EN 13725	On installation of new / replacement odour arrestment equipment (see also note 1).
2	Odour	Contained Lower Odour Intensity process releases	Where installed any odour arrestment plant installed on lower odour intensity emissions should have an odour removal efficiency of not less than 85% (see also notes f and g).		
<p>Note 1 - when offensive odours are detected beyond the process boundary or complaints are received and there is no obvious cause of odour release then the operator shall check the odour abatement plant performance using Table 2 guide values and check the process operational controls. If notified by the regulator, odour removal efficiencies shall be retested.</p>					
3	Particulate matter	Emissions from contained sources	20 mg/m ³	<p>EITHER</p> <p>Gross filter failure device</p> <ul style="list-style-type: none"> provide audible and visual alarms <p>plus</p> <ul style="list-style-type: none"> extractive test 	<ul style="list-style-type: none"> continuous <p>plus</p> <ul style="list-style-type: none"> annual
				<p>OR</p> <p>Filter leak monitor</p> <ul style="list-style-type: none"> provide visual alarms record trend output and alarms <p>plus</p> <ul style="list-style-type: none"> extractive test 	<ul style="list-style-type: none"> continuous <p>plus</p> <ul style="list-style-type: none"> every 3 years

4	Particulate matter	Whole Site	No visible emission	Visual observations, with particular attention to areas where dust may be generated	*On start-up and on at least two more occasions during the working day*
		Silo inlets and outlets	Designed to emit less than 10mg/m ³		At time of delivery
5	Droplets, persistent visible emissions	All emissions to air (except steam and condensed water vapour)	No droplets, no persistent visible emissions	Visual observations	*On start-up and on at least two more occasions during the working day*
6	Visible smoke	Combustion processes used for abatement of odour should be free from visible smoke	No visible smoke	Visual observations	*On start-up and on at least two more occasions during the working day*

Notes

- a) The reference conditions for limits in Table 1 are: 273.1K, 101.3kPa, without correction for water vapour content, unless stated otherwise.
- b) All periodic monitoring shall be representative, and shall use standard methods.
- c) *All periodic monitoring results shall be checked by the operator on receipt and sent to the Council within 8 weeks of the monitoring being undertaken.*
- d) [The [] emission limits do not apply during start-up and shut down. All emissions shall be kept to a minimum during these periods.]
- e) The continuous monitoring provision should be disapplied where emissions do not exceed 20 mg/m³ without the use of abatement plant. This should be demonstrated by a single sampling exercise undertaken in accordance with **paragraph 4.2**. A further such monitoring exercise may be required in the event of a substantial change to the process
- f) in cases where the inlet odour concentrations are very low the accepted odour arrestment plant efficiency should be either a destruction efficiency of 85% or the final discharge to air should contain less than 200 odour units/m³ (due to measurement reproducibility and plant efficiency at low concentrations).
- g) Abatement for mixed intensity odour should have an emission limit calculated using mass flow of odour units.

Permit writer to delete rows that do not apply to the specific site

Table 2 - Odour abatement plant - Indicative guide provisions for monitoring

Type of Odour abatement plant	Indicative Guide Substance and Value	Type of monitoring	Monitoring frequency
Thermal oxidiser or combustion plant use as odour abatement plant	Emissions of carbon monoxide (CO) at : <ul style="list-style-type: none"> • 100mg/m³ (expressed as a 30 minute mean at 273K and 101.3Pa; or • 850°C 	<ul style="list-style-type: none"> • Carbon monoxide – recording, indicative monitor with visible and audible alarms • Temperature - monitor and audible and visual alarms 	Continuous
Scrubbing equipment	<ul style="list-style-type: none"> • liquor flow • pH or <ul style="list-style-type: none"> • Redox potentials established during commissioning 	Monitor and alarms (audible and visual)	Continuous Record daily
	Alternative parameter is the measurement of Chemical Oxygen Demand (COD)	Monitor and record to establish optimum operating levels	Record daily
Bioscrubber additionally needs	Pressure drop across scrubber packing established during commissioning	Monitor and alarms (audible and visual)	Continuous Record daily
Biofilter	Pressure drop across biofilter established during commissioning (delivery pressure of main fan is one suitable parameter)	Monitor and alarms (audible and visual) Record trigger levels if level is varied (for example, winter/summer settings, change in number of fans in use)	Continuous Record daily

Biobed	Moisture <ul style="list-style-type: none"> • even flow/throughput • temperature • cracking • steam venting 	Visual inspections might look for: even flow, is it damp, quantity of water going in, meters installed in biobed is unlikely.	Daily
Condensers for pre-treatment of emissions	Cooling liquid flow	Monitor	Continuous

Notes

- a) Testing of odour abatement plant should be carried out, if possible, when the process is being operated at peak production (also taking ambient temperature into account)
- b) Destruction efficiency testing requires simultaneous sampling at inlet and outlet of abatement plant
- c) If emissions exceed this indicative guide value it is likely that the odour destruction efficiency of the odour abatement plant is reduced and the scrubber/biofilter should be further investigated to identify reasons for the reduced performance. This testing can be carried out using gas detection tubes. (further guidance on gas detection tubes is included in **Appendix 4**)

Right to Appeal

You have the right of appeal against this permit within 6 months of the date of the decision. The Council can tell you how to appeal [*or supply details with the permit*]. You will normally be expected to pay your own expenses during an appeal.

You will be liable for prosecution if you fail to comply with the conditions of this permit. If found guilty, the maximum penalty for each offence if prosecuted in a Magistrates Court is £50,000 and/or 6 months imprisonment. In a Crown Court it is an unlimited fine and/or 5 years imprisonment.

Our enforcement of your permit will be in accordance with the [Regulators' Compliance Code](#)

Appendix 2 - Application form for a simple permit for the manufacture of pet food

Application for a permit for the manufacture of pet food

Local Authority Pollution Prevention and Control
Pollution Prevention and Control Act, 1999
Environmental Permitting (England and Wales) Regulations 2010

Introduction

When to use this form

Use this form if you are applying for a permit to a Local Authority to operate a pet food manufacturing installation as defined in Schedule 1 to the Environmental Permitting Regulations.

The appropriate fee must be enclosed with the application to enable it to be processed further. When complete, send the form and the fee and any additional information to:

[Insert local authority address]

If you need help and advice

We have made the application form as straightforward as possible, but please get in touch with us at the local authority address given above if you need any advice on how to set out the information we need.

For the purposes of Section G of the form, a relevant offence is any conviction for an offence relating to the environment or environmental regulation.

For Local Authority use

Application reference	Officer reference	Date received

LAPPC application form - to be completed by the operator

A The basics

A1 Name and address of the installation

Postcode:	Telephone:
-----------	------------

A2 Details of any existing environmental permit or consent

(for waste operations, include planning permission for the site, plus established use certificates, a certificate of lawful existing use, or evidence why the General Permitted Development Order applies.)

--

A3 Operator details

(The 'operator' = the person who it is proposed will have control over the installation in accordance with the permit (if granted).)

Name:
Trading name, if different:
Registered office address:
Principal office address, if different:
Company registration number:

A4 Any holding company?

Is the operator a subsidiary of a holding company within the meaning of section 1159 of the Companies Act 2006? If "yes" please fill in details of the ultimate holding company.

Yes No

Name: Trading name, if different:
Registered office address: Principal office address, if different:
Company registration number:

A5 Who can we contact about your application?

It will help to have someone who we can contact directly with any questions about your application. The person you name should have the authority to act on behalf of the operator - This can be an agent or consultant.

Name and position: _____
Telephone: _____
Email: _____

B The installation

B1 Are you a manufacturer of pet food?

Yes No

B2 Why is the application being made?

new installation

change to existing installation means it now needs a permit

B3 Site maps – please provide:

A location map with a red line round the boundary of the installation

Document reference: _____

A site plan or plans showing where all the relevant activities are on site:

- a) where the processing plant will be installed
- b) the areas and buildings/structures designated for materials and waste storage and the type of storage
- c) the conveyors and transfer points
- d) any directly associated activities or waste operations.

To save applying for permit variations, you can also show where on site you might want to use for storage etc in the future.

Document reference: _____

B4 Are there any sites of special scientific interest (SSSIs) or European protected sites nearer than any of the following distances to the proposed installation?

2km - for an installation which includes Part B combustion or incineration (not crematoria)

Yes No

0.5km for all other Part B activities

Yes No

If 'yes', is the installation likely to have a significant effect on the special scientific interest or European protected sites?

Yes No

If 'yes', please write on a separate sheet or enclose a relevant document explaining what the implications are for the purposes of the Conservation (Natural Habitats etc) Regulations 1994 (see appendix 2 of Annex XVII of the [general guidance manual](#))

Document reference: _____

B5 Will emissions from the activity potentially have significant environmental effects (including nuisance)?

Yes No

If 'yes', please list the potential significant local environmental effects (including nuisance) of the foreseeable emissions on a separate document.

Document reference: _____

If 'yes', please enclose a copy of any environmental impact assessment which has been carried out for the installation under planning legislation or for any other purpose.

Document reference: _____

C The details

For the purposes of questions C1 – C6 the phrase “raw material(s)” is taken to mean “previously unprocessed animal protein”.

C1 Do you receive any previously unprocessed animal protein as part of your manufacturing process? *[informs conditions 2, 4 & 8]*

Yes No

If no, go to C7.

If yes, do you have designated delivery areas for vehicles containing raw materials?

Yes No

C2 Do you have designated cleaning areas for the following: *[informs condition 8]*

- a) equipment that holds raw materials and waste raw materials? *(tick all that apply)*
b) containers that hold raw materials and waste raw materials?
c) vehicles that come into contact with raw materials and waste raw materials?

C3 Are all raw materials delivered in fully-enclosed containers? *[informs condition 4]*

Yes No

C4 Where are raw material containers opened? *[informs condition 4 & 8]*

- a) inside process buildings designed to prevent uncontrolled release of odours *(tick all that apply)*
b) outside processing areas
c) other - please specify _____

C5 Do you conduct de-frosting activities on received raw materials? *[informs condition 9]*

Yes No

C6 Will your process produce any waste raw material(s)? *[informs condition 4 & 8]*

Yes No

If yes, please indicate how the raw material waste is contained prior to removal from site:

- a) inside process buildings, not designed to prevent uncontrolled release of odours? *(tick all that apply)*
b) inside process buildings designed to prevent uncontrolled release of odours?
c) outside the processing areas?
d) other - please specify _____

C7 Where is your manufacturing process carried out?

[informs condition 4]

- a) inside a building without extraction of air (tick all that apply)
- b) inside a building where air is extracted but **not** passed through odour abatement
- c) inside refridgerated rooms
- d) inside areas maintained at negative pressure

C8 Do you extract odorous air and pass it through abatement plant?

[informs condition 1, 5, 6, 15, 16, 17]

Yes No

If yes, what kind of plant is it?

- a) thermal oxidiser (tick all that apply)
- b) chemical scrubber
- c) bio-bed
- c) bio-scrubber
- d) other - please specify _____

C9 Is a condenser fitted before the odour treatment?

[informs condition 16 & 17]

Yes No

C10 Please list which of your process tabks/vessels are fully enclosed, or alternativley, which are not fully enclosed, whichever is the shorter list:?

[informs condition 7]

- a) _____ b) _____ c) _____ d) _____
- e) _____ f) _____ g) _____ h) _____
- i) _____ j) _____ k) _____ l) _____

C11 Does your process receive dusty raw materials?

[informs condition 3]

Yes No

If yes, please indicate the storage facilities used on site to store dusty materials:

[informs condition 12, 13 & 14]

- a) silo? (tick all that apply)
- b) bulk storage tank?
- c) in fully enclosed containers/packaging?
- d) other – please specify: _____

C12 How are dusty materials transferred/conveyed around site (external transfer)?

[informs condition 14]

- a) fully-enclosed belt conveyors (tick all that apply)
- b) fully-enclosed pneumatic transfer
- c) fully-enclosed containers/packaging transported by vehicle/forklift
- d) fully-enclosed bucket conveyors
- e) unenclosed/uncontained transport by vehicle/forklift
- h) other – please specify: _____

C13 Do you have pneumatic loading/unloading for dusty raw materials?

[informs condition 12]

- Yes No

If no, please go to C14.

If yes, will displaced air from pneumatic loading and unloading be:

- a) vented to abatement plant? (tick all that apply)
- b) back-vented to the delivery tanker?
- c) other – please specify: _____

Does pneumatic transfer automatically stop for:

[informs condition 12]

- a) vented to abatement plant? Yes No
- b) back -vented to the delivery tanker? Yes No

If no, are any silos new since 1st August 2006?

[informs condition 12]

- Yes No

Do you have alarms to warn of overfilling?

[informs condition 12]

- Yes No

C14 Please list the identification numbers for all storage vessels with pneumatic loading/unloading:

[informs condition 7]

- a) _____ b) _____ c) _____ d) _____
- e) _____ f) _____ g) _____ h) _____
- i) _____ j) _____ k) _____ l) _____

C15 Does your installation have particulate abatement equipment, not serving silos, with external discharge points? *[informs condition 15, 16 & 17]*

Yes No

If yes, what kind of equipment is in place?:

- a) wet scrubber *(tick all that apply)*
- b) bag filtration plant
- c) cyclones
- e) other – please describe: _____

C16 Do you have continuous emissions monitors for monitoring particulate? *[informs conditions 16 & 17]*

Yes No

If no, go to C12.

If yes, do continuous emissions monitors have alarms?

Yes No

If yes, are the alarms:

- a) visible? *(tick all that apply)*
- b) audible?
- c) alarm activation recorded automatically?
- d) is a trigger level set? Yes No

If yes, at what percentage of the emission limit is the value set?.....%

C17 Will your process produce any dusty waste? *[informs conditions 13]*

Yes No

If no, go to C19.

If yes, how will dusty material/dusty waste be contained?

- a) bagged? *(tick all that apply)*
- b) lidded containment?
- c) other – please specify: _____

C18 Will any dusty materials/ dusty waste be stored externally? *[informs conditions 13]*

Yes No

If yes, what facilities will be provided to store dusty waste externally?

- a) covered storage area for bagged dusty materials? *(tick all that apply)*
b) lidded containment for loose dust?

Please describe how loose dust is transferred from the source of loose dust to the storage area for loose dust:

- c) other – please specify: _____

C19 Do you have an odour response procedure (or plan)? *[informs conditions 1, 18 & 19]*

Yes No

C20 Do you have environmental management procedures and policy? *[informs conditions 1, 18 & 19]*

Yes No

C21 Have you received any complaints of odour beyond the site boundary in the last three years including those notified to site by the local regulator? *[informs conditions 1, 18 & 19]*

Yes No

If yes, please complete the following:

- a) How many complaints have you received in the last three years? _____
b) What is the date of the last complaint received at site? _____

D Anything else?

Please tell us of anything else you would like us to take account of:

Document reference: _____

E Application fee

You must enclose the [relevant fee](#) with your application.

If your application is successful you will also have to pay an annual subsistence charge, so please say who you want invoices to be sent to.

Name and position:

Telephone:

Email:

F Protection of information

F1 Any confidential or national security information in your application?

If there is any information in your application you think should be kept off the public register for confidentiality or national security reasons, please say what and why. [General guidance manual](#) chapter 8 advises on what may be excluded. *(Do not include any national security information in your application. Send it, plus the omitted information, to the Secretary of State or Welsh Ministers who will decide what, if anything, can be made public.)*

Document reference : _____

F2 Please note: data protection

The information you give will be used by the Council to process your application. It will be placed on the relevant public register and used to monitor compliance with the permit conditions. We may also use and or disclose any of the information you give us in order to:

- consult with the public, public bodies and other organisations;
- carry out statistical analysis, research and development on environmental issues;
- provide public register information to enquirers;
- make sure you keep to the conditions of your permit and deal with any matters relating to your permit;
- investigate possible breaches of environmental law and take any resulting action;
- prevent breaches of environmental law;
- offer you documents or services relating to environmental matters;
- respond to requests for information under the Freedom of Information Act 2000 and the Environmental Information Regulations 2004; (if the Data Protection Act allows)
- assess customer service satisfaction and improve our service.

We may pass on the information to agents/representatives who we ask to do any of these things on our behalf.

F3 Please note: it is an offence to provide false information

It is an offence under regulation 38 of the EP Regulations, for the purpose of obtaining a permit (for yourself or anyone else), to:

- make a false statement which you know to be false or misleading in a material particular;
- recklessly make a statement which is false or misleading in a material particular;
- intentionally to make a false entry in any record required to be kept under any environmental permit condition;
- with intent to deceive, to forge or use a document issued or required for any purpose under any environmental permit condition.

If you make a false statement:

- we may prosecute you; **and**
- if you are convicted, you are liable to a fine or imprisonment (or both).

G Declarations A and B for signing, please

These declarations should be signed by the person listed in answer to question A3. Where more than one person is identified as the operator, all parties should sign. Where a company or other body corporate is the operator, an authorised person should sign and provide evidence of authority from the board.

Declaration A: I/We certify

EITHER - As evidence of my/our competence to operate this installation in accordance with the EP Regulations, no offences have been committed in the previous five years relating to the environment or environmental regulation.

OR - The following offences have been committed in the previous five years which may be relevant to my/our competence to operating this installation in accordance with the regulations:

Signature: _____ Name: _____

Position: _____ Date: _____

Declaration B:

I/We certify that the information in this application is correct. I/We apply for a permit in respect of the particulars described in this application (including the listed supporting documentation) I/we have supplied.

(Please note that each individual operator must sign the declaration themselves, even if an agent is acting on their behalf.)

Signature: _____ Name: _____

Position: _____ Date: _____

Signature: _____ Name: _____

Position: _____ Date: _____

Signature: _____ Name: _____

Position: _____ Date: _____

Appendix 3 - Guidance on the preparation of an odour response procedure

What is an odour response procedure?

An odour response procedure is a summary, provided by the operator, of the foreseeable situations which may compromise his ability to prevent and/or minimise odorous releases from the process and the actions to be taken to minimise the impact. It is intended to be used by operational staff on a day-to-day basis and should detail the person responsible for initiating the action.

The procedure is intended primarily to document foreseeable events which are outside of the control of the operator and those that are preventable by maintenance and operational control (for example pump failure, biofilter compaction or filter breakthrough). The procedure should include a maintenance programme for all odour abatement equipment and other odour containment measures (such as building structure, ventilation plant).

What is the format for the odour response procedure?

The odour response procedure should be a written document which is available on-site and should be submitted to the regulator. The regulator may wish to set conditions in the permit/authorisation which reflect the undertakings given in the procedure (for example maximum abatement plant by-pass times, reduced throughput etc).

What should be included in the odour response procedure?

There are four main reasons for releases which may lead to emissions of offensive odour which are:

1. Changes in process conditions leading to more odour generation or a change in the odour characteristics.
2. Conditions which result in fugitive releases due to reduced odour containment.
3. Failures or reduced performance of odour abatement equipment.
4. Factors affecting the dispersion between the source and the receptor.

The occurrence of points 2 and 3 above can be limited by the production of, and compliance with, an effective plant and building maintenance programme. Examples of other issues which should be considered in each of these categories are given in **Table A**.

In order to prepare an assessment of possible abnormal conditions and the options for mitigation of the odour, the operator will need to consider:

- the activity which produces the odour and the point of odour release;
- possible process or control failures or abnormal situations;
- potential outcome of a failure in respect of the likely odour impact on local sensitive receptors;
- what actions are to be taken to mitigate the effect of the odour release and details of the persons responsible for the actions at the site.

Table A - Examples of issues to consider relating to odour release

Factors leading to odour release	Examples of issues to consider
Those which have potential to affect the process and the generation of odour	<ul style="list-style-type: none"> • Materials input - seasonal variation in weather may affect odour of materials particularly if putrescible. • Process parameters such as changes in temperature/pressure • Rate of throughput or increased hours of operation • High levels of ammonia within the process buildings (possibly due to high ambient temperatures).
Those which affect the ability to abate/minimise odour	<ul style="list-style-type: none"> • Poor performance of biofiltration or poisoning (may be the result of poor maintenance or mis-operation) • Flooding of the biofilter due to abnormally high rainfall • External failure of other utilities, e.g. water supply, gas supply for combustion equipment where the operator has signed up to an interruptible gas supply • Mechanical breakdown of arrestment plant such as pumps, fans etc • Power failure • Compaction of the biofilter or surface fissures • Saturation of a carbon filter bed and subsequent breakthrough of odours • Below optimum temperature of a thermal oxidiser or boiler etc • Saturation of scrubber liquor, blocked injection nozzles etc.
Those which affect the ability to contain odour	<ul style="list-style-type: none"> • Building damage which affects integrity due to for example storms • Power failure • Failure of automatic doors, i.e. in open position • Failure in procedures to maintain containment (human error)
Those affecting dispersion between the source and sensitive receptors‡	<ul style="list-style-type: none"> • Short term weather patterns which fall outside of the normal conditions for that area and are highly unusual (not just the normal meteorological pattern) - inversions and other conditions unfavourable to dispersion should have been considered in designing the process • Weather - wind direction, temperature, inversion conditions if these are normal variants of local weather • Loss of plume buoyancy/temperature

‡ The process design should incorporate control measures to ensure that under the normal range of meteorological conditions for the area, no emissions result in offensive odour that is detectable beyond the process boundary.

Appendix 4 - Method for sampling of emissions from biological (earth, peat and heather) filters using gas detection tubes

1. Routine monitoring of emissions from biological filters can be readily undertaken using gas detection tubes. However, it is important to ensure that a number of representative samples are obtained and that care is taken in the interpretation of results. The number of samples necessary will depend upon the gas distribution within the biological filter.
2. It is essential that samples are taken from a representative volume of emitted gas as near surface dispersion will significantly affect measured concentrations. Therefore, it is necessary to reduce dispersion and obtain a volume of gas from which to sample. This can be achieved by placing a purpose-made enclosure on top of the filter bed and allowing the emitted gases to accumulate.
3. The enclosure itself should be approximately 0.5 m^3 - 1 m^3 in volume, preferably with a 1 m square open base. The top of the enclosure should have an opening of approximately 50 mm diameter to facilitate sampling. The enclosure can be simply fabricated using a timber frame and plywood or hardboard sides and top with mastic or other suitable sealant applied to the side and top joints.
4. It will be extremely difficult to achieve a seal at the filter bed surface, however the enclosure should be located in order to minimise leakage from the points of contact with the filter bed. The enclosure should remain at the sample location for at least 10 minutes prior to sampling to ensure that a representative sample of emissions is obtained (allowing the volume of the enclosure to be purged three times).
5. The gas detection tubes should be used in accordance with the manufacturer's instructions. Amines and amides are a common interference with gas detection tubes for ammonia and therefore results obtained from ammonia gas detection tubes should be compared to a 2 ppm v/v indicative guide value. It may be necessary to monitor for hydrogen sulphide and mercaptans separately depending upon the detector tube specification.
6. This method is only suitable for open biomass type biofilters where no final discharge vent or stack exists.

Additional information is available in BS EN13725 - "Air Quality - Determination of Odour Concentration by Dynamic Olfactometry" and "Odour Measurement and Control" Update published by National Environmental Technology Centre, Culham, Abingdon. Oxon OX14 3DB. ISBN 0-85624-8258.

Appendix 5 - Imposing an odour boundary condition

The following should be applied in relation to odour:

- Permits should include specific technical conditions in accordance with this guidance to prevent or generally reduce the escape of offensive odour across the site boundary. As discussed below, whether the emphasis should be on prevention, or on reduction, depends on the type of process (and thus the type of odour) under consideration.
- Subject to what is said below, in the case of pet food manufacturing - which gives rise to odours that are particularly offensive - conditions should be imposed preventing (rather than just reducing) the escape of offensive odour beyond the site boundary. In these cases the specific technical conditions imposed to prevent such escapes should be supplemented, as a back-up measure, with a general condition (an **odour boundary condition**) requiring emissions to be free from offensive odour outside the site boundary.
- When imposing an odour boundary condition, local authorities should take account of the fact that there may be circumstances where offensively odorous emissions are released for reasons which are beyond the direct control of the installation operator, for example, where there is a total breakdown of arrestment plant through no fault of the operator. Allowance should be made for such occurrences by providing in the permit that it will not be a breach of the condition in a particular case if the operator can show that he or she took all reasonable steps and exercised all due diligence to prevent the release of offensive odour.
- Local authorities will need to investigate incidents where offensive odour escapes across the site boundary to establish whether there has been a breach of any odour boundary condition. The Secretary of State would expect that if pet food manufacturing is properly managed, with the operator taking all reasonable steps and exercising all due diligence, there should be very few escapes of offensive odour beyond the site boundary. Certainly he/she would expect local authorities to investigate very carefully whether an operator was taking all reasonable steps and exercising all due diligence if there were more than two such occurrences in any 12-month period. In the event of any occurrence the operator should immediately take remedial action to prevent any further escape of offensive odour and he/she would expect this to be effective within, at most, two hours. Again, the Secretary of State would expect local authorities to investigate with particular care the management of a pet food manufacturing activity where remedial action had not been effective within 2 hours.

The locality of a process site will influence the assessment of the potential for odour impact. In cases where the site has a low odour impact due to its remoteness from sensitive receptors and the escape of offensive odour beyond the site boundary would be unlikely to cause harm, the provision in this note to arrest odorous emissions may not be necessary to demonstrate BAT. In such cases it would not be appropriate to require an operator to ensure that no such odours cross the site boundary and no odour boundary condition should be imposed.

In these circumstances it is expected that the operations should be optimised to minimise odour emissions and also that effective process management is applied. Assessment of the potential for odour impact beyond the site boundary should take account of all predicted wind directions and weather conditions which are typical of the location in question

In all cases, the assessment of offensiveness should be as perceived by the local authority regulator and should take into account the nature of the odour.

- There shall be no offensive odour beyond the site boundary as perceived by the regulator. It shall not be a breach of this condition in a particular case if the operator can show that they took all reasonable steps and exercised all due diligence to prevent the release of offensive odour.