REGULATION (EC) No 1774/2002
laying down health rules concerning animal by-products not intended for human consumption.

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CONTROLS ON LOW CAPACITY ANIMAL CARCASE INCINERATION PLANTS – Version 2.2

These notes are intended as guidance for Defra and State Veterinary Service officials and for incinerator operators. They are likely to be subject to some revision in the light of experience gained. Please note the version number at the top of the page. The most recent version of the guidance will be available from the Defra Animal By-Products website (http://www.defra.gov.uk/animalh/by-prods/default.htm)

Please note: The information contained herein is to assist with the understanding of the above legislation. It is not a definitive interpretation of the law which only the courts can provide.

If you have any questions/comments on this Guidance Note, please email us on animal-by-products@defra.gsi.gov.uk.

Background

1. Article 12 of the "Animal By Products Regulation" (Regulation (EC) No 1774/2002) provides for the approval of incinerator plants burning only animal by-products (i.e. animal carcases/ parts of carcases) and which are exempt from the more onerous controls of the Waste Incineration Directive, 2000/76/EC (WID). This applies to most incinerators on farms, at hunt kennels and knackers' yards, and at pet crematoria. Those incinerator plants which burn “processed products” (e.g. meat and bone meal, tallow), catering waste or material other than animal carcases/parts of carcases must be approved under the WID, even if they burn animal by-products as well.

2. Regulation (EC) No 1774/2002 permits high capacity (>50kg/hour) incinerator plants to burn Specified Risk Material and ruminant carcases. Furthermore, Commission Regulation 808/2003 of 12 May 2003 amended Regulation 1774/2002 to permit the incineration of Specified Risk Material (SRM) or ruminant carcases containing SRM in low capacity (<50kg/hour) incinerator plants. Specific measures with which these low capacity incinerators must comply are now included in Annex IV, Chapter VII, of the amended Regulation. These additional SRM controls will not apply to the majority of existing low capacity incinerator plants that only incinerate pig and poultry carcases.
3. Regulation 1774/2002 is enforced in England by the Animal By-Products Regulations 2005 ((SI 2005/2347) ABPR). In particular, regulation 14 covers incinerator approvals, regulation 35 covers record keeping, and Schedule 3 (Part VI) covers transitional measures for low capacity incinerators. Similar legislation has been introduced in the rest of GB.

4. Under the ABPR, the State Veterinary Service is responsible for inspecting and approving incinerator plants in accordance with Regulation 1774/2002. The controls with which operators must comply are explained in Appendix 1. These apply in addition to the environmental controls summarised in Appendix 2 which are the responsibility of the Environment Agency or the Local Authority, depending on the size of the incinerator.

5. Low capacity incinerators burning animal by-products that are waste, other than carcases from agricultural premises, are controlled by the waste management provisions under Part II of the Environmental Protection Act 1990. These premises are regulated by the Environment Agency and are required to either:

   (a) be controlled by a waste management licence e.g. Pet crematoria; or

   (b) operate within the exemption from licensing provided by paragraph 29 of Schedule 3 of the Waste Management Licensing Regulations 1994 (WMLR). This is subject to a number of restrictions and applies only if the waste is incinerated at the site of production by the person producing it, and there is no risk to human health or the environment.

Therefore, although a plant may be approved under the ABPR it may also require licensing under the WMLR e.g. a pet crematorium burning non-agricultural waste.

6. The provisions of Regulation 1774/2002 applied in full:

   - from 1 May 2003 for low capacity (less than 50 kg/hour) incinerator plants which commenced operation after 1 November 2002 or which incinerate SRM or ruminant carcases from which the SRM has not been removed; and

   - from 1 January 2005 for non-SRM low capacity incinerator plants which commenced operation on or before 1 November 2002.

7. Low capacity incinerator plants are incinerator plants with a throughput of less than 50 kg of animal by-products per hour. This category of incinerator is deemed to be exempt from the requirements of Part B Local Authority Air Pollution Control. In order to validate whether a particular incinerator is exempt from these controls, you should contact your Local Authority.
NB: To ascertain ‘throughput’ it is necessary to know the capacity of the plant. For the purpose of approving animal carcass incinerators, we interpret ‘throughput’ as meaning the ‘sum of the incineration capacities of the furnaces of which an incineration plant is composed, as specified by the manufacturer and confirmed by the operator, with due account taken, in particular, of the calorific value, expressed as the quantity of waste incinerated per hour’.

This is the definition of ‘nominal capacity’ in Article 3(7) of Directive 2000/76/EC’ (Waste Incineration Directive).

Operators of a multi-incinerator plant must contact their local authority, who may require further information, to ascertain whether or not the plant is indeed operating at under 50kg/hour.

Provided the local authority is content that the plant is operating at under 50kg/hour, we should consider it as being a 'low capacity' plant for the purpose of approving the premise under the ABPR.

8. **SVS Inspections and Approvals**

8.1 When the Animal By-Products Regulations 2003 came into force on the 1 July 2003, we issued general approvals to premises which had previously been handling animal by-products e.g. on-farm non-SRM incinerators. The purpose of the general approvals was to allow sufficient time for operators to apply for approval, and for the State Veterinary Service (SVS) to undertake the necessary inspection visits and grant or refuse an individual approval.

8.2 These general approvals have now expired and operators must obtain and complete an application form (ref: abpr 2) for individual approval from their local animal health office.] 8.3 Failure to obtain an individual approval will mean that the incinerator is operating illegally and continued use of them to dispose of animal by-products is a criminal offence.

NB: Approval may be withdrawn at any time if the operator does not comply with the basic transitional requirements in paragraph 9 above and, if so, will not be re-instated until the incinerator complies with the full requirements of Regulation 1774/2002.

9. **WID Approved Incinerators**

9.1 Although, the SVS are not responsible for the approval of WID incinerator plants, veterinary officials will inspect these plants to ensure compliance with the other provisions of the ABPR e.g. record keeping requirements, pest control, transportation and collection of animal by-products.
10. Validating Incinerators:

10.1 We have agreed that manufacturers can seek Type Approval from Defra for their various models of low capacity incinerator. The reason for this is twofold;

(i) Type Approval will demonstrate that the “residence time” of gases can be achieved in accordance with the Regulation in that particular model (i.e. The gases resulting from the combustion process must reside in the combustion chamber for at least 2 seconds at 850°C); and

(ii) The issuing of Type Approvals will assist incinerator operators/manufacturers in demonstrating that the incinerators comply with the requirements of the Regulation without the need to seek independent verification of the residence time for each individual incinerator. However, if, at anytime, the approving authority (SVS/Defra) are not content that the “residence time” requirements are being met, they can ask for additional independent verification, at the operators/manufacturers expense (as appropriate), and approval may be subsequently withdrawn if that verification cannot be given. Additionally, the competent authority must be seen to be verifying the data on which we have based out Type Approvals. Therefore, we propose that, during 2005 we will require independent verification at the manufacturers expense of the technical data on which Type Approval was based. Initially this would be for 1 model per manufacturer, on a specific model chosen by Defra.

10.2 A suggested methodology that manufacturers can use is at Appendix 3, but alternative methods may be used provided they take account of operation according to the manufacturers’ standards, the flow of the main (and usually secondary) chamber, and demonstrated flow rate through the stack. Where such alternative methods are used, Defra may require that the methodology is independently verified at the manufacturers expense.

NB: The Type Approval Methodology, as set out in Appendix 3, is only applicable to incineration plants which have both a primary and secondary chamber fitted. Manufacturers/operators of single chamber incinerators must obtain independent verification of the residence time prior to seeking approval.

10.3 Prior to the inspection visit for approval, operators should check with either their incinerator manufacturer or with their local Defra Animal Health Office as to whether or not their incinerator is either;

a) a fully Type Approved Incinerator i.e. Defra is satisfied that, on the basis of the information submitted by the manufacturer, the incinerator model complies with the “residence time” requirements; or

b) are currently undergoing Defra verification of the Type Approval Declaration information submitted by the manufacturer.
10.4 Any incinerators, which do not have Defra Type Approval, must be certified independently to the same standard (i.e. The gases resulting from the combustion process must reside in the combustion chamber for at least 2 seconds at 850°C) at the operator's expense from a [suitably qualified person]. The incinerator operator must make available to Defra, copies of all of the information submitted to the independent person/persons to allow Defra verification of the information to take place.

10.5 Where, at the time of approval, Type Approval and/or independent certification have been sought but have not yet been granted a time-limited approval to the operator may be issued.

10.6 At the SVS inspection visit, the inspector will ensure that either;

a) Type Approval has been granted, or has been sought but has not yet been granted, and that the incinerator's Type Approval settings are being used or bettered; or

b) Independent validation has been accepted in writing by Defra or has been sought but has not yet been accepted, and that the incinerator's settings (as set out in the independent certification) are being used or bettered i.e. that the incinerator is operating in accordance with manufacturers instructions.

11. **Biosecurity Measures**

11.1 Commission Regulation 808/2003 amended Annex IV, Chapter I of Regulation 1774/2002 to require specific hygiene conditions when operating an incinerator plant. Additional biosecurity measures which mobile incinerators should comply with are given in paragraph 13 below.

12. **Shared incinerators**

12.1 Fallen stock must not be taken from one livestock holding for incineration on another livestock holding, unless the two holdings are operated as though they were a single farming operation. If farmers are to share a stationary incinerator, it should be sited on premises on which no livestock are kept. If the premises was originally part of the livestock holding, it must be treated as completely separate i.e. fenced, with a dedicated entrance and equipment and, if possible, a dedicated operator. In particular, the hygiene standards outlined below in relation to paragraph 2 of Annex IV of the Regulation 1774/2002 must be followed.

12.2 Non SRM ash derived from a shared incinerator used by different farms is a controlled waste and must be disposed of to an appropriately authorised landfill site.
12.3 Farmers operating shared or commercial incinerators can contact their local Environment Agency office, via the Environment Agency’s general helpline on 0845 9333111, to ascertain which landfill sites in their local area can accept carcase ash for disposal.

12.4 Further guidance on incinerator ash disposal can be found in Annex IV.

13. Mobile incinerators

13.1 Mobile incinerators may also be used. They have potential benefits e.g. in disposing of diseased material without moving them from the farm of origin. They also, however, have the potential to introduce disease from one livestock holding to another, and stringent biosecurity measures, in line with those applied to vehicles travelling between farms, should be applied and a dedicated operator should be used. A biosecurity cleansing and disinfection procedure should be agreed as part of a Standard Operating Procedure (SOP). Mobile incinerators must also comply with all relevant sections of, in particular, Annex IV, Chapter I. This includes provision of a written cleaning programme for the incinerator prior to its leaving a premises.

13.2 As well as complying with all of the general operating standards required for a ‘static’ incineration plant, operators wishing to use a mobile incinerator must identify at Section 5 of the application form (Ref: ABPR 2), those premises on which they may wish to operate the incinerator.

13.3 Each premises will then be inspected and if approved added to the list on the incinerator approval. Use at named premises will be a condition of the approval. The mobile incinerator may not be used on any other sites. The approval document may be revised to add or remove premises.

13.4 The incinerator must be emptied, cleaned and disinfected before it enters another livestock premises.

13.5 Fallen stock should preferably be incinerated on the premises where they have fallen, although they may be moved to non-livestock premises for incineration. Only whole carcases should be handled.

13.6 It is unlikely that mobile incinerators would be used to burn pets. If they do, an “ashes back” services should not be provided if the incinerator is used to burn SRM. All SRM ash must go to licensed landfill.

13.7 With regard to waste management regulations the incineration of carcases from agricultural premises in a mobile incinerator will be handled the same as for shared incinerators and reference should be made to paragraph 12 above.
14. Disposal of ash from on-farm incineration

14.1 Following the coming into force of the Agricultural Waste Regulations on 15 May 06, non-SRM ash from pig and poultry carcasses derived from on-farm incineration is now considered to be a ‘controlled waste’, and must be disposed of as such (i.e. via licensed landfill).

14.2 Farmers wishing to dispose of such ash on-farm need to apply for a waste management licence before the end of the transitional period of 12 months. However, a consultation is planned on a possible exemption which would allow non-SRM ash to be spread to land for agricultural benefit, without the need for a WM licence. A decision on this possible exemption will be made before the 12 month transitional period is over.

14.3 During the 12 month transitional period farmers wishing to spread non-SRM ash to land should contact the Environment Agency for advice.

14.4 Further guidance on incinerator ash disposal can be found in Annex IV.
APPENDIX 1

Summary of controls in Regulation 1774/2002

The EU controls that apply to animal carcase incinerators are set out in Article 12 and Annex IV of Regulation 1774/2002, as amended by Regulation 808/2003. Some of the provisions are open to interpretation and the following explains how we propose to interpret them in Great Britain.

Article 12

Approval under the Waste Incineration Directive or Regulation 1774/2002?

Article 12.1 requires the incineration or co-incineration of processed products (e.g. meat and bone meal and tallow) to take place in an incinerator or co-incinerator approved under the Waste Incineration Directive, 2000/76/EC. The provisions of the WID applied immediately to all new incineration plant installed on or after 28 December 2002 and from 28 December 2005 for those installed earlier.

Article 12.1 also states that high and low capacity incinerator plants which only burn animal by-products and are not subject to the WID must comply with the relevant Annex IV requirements of Regulation 1774/2002, as stipulated in Articles 12.2 and 12.3 respectively.

NB: Currently, there is some debate as to whether the exemption from WID will also extend to incinerators burning parts of animal carcases. Until this issue is resolved at EC level, in England and Wales, we intend to take a pragmatic approach and consider as being WID exempt, incinerators which:

(i) only burn animal carcases, including those carcases which have been cut to facilitate incineration at point of disposal; and/or

(ii) parts of animal carcases e.g. animal by-products such as SRM etc. from slaughterhouses, knacker yards or butchery operations

However, this approach does not extend to any processed animal by-products such as tallow or MBM or to any products of animal origin such as former foodstuffs or catering waste.

We intend to review this approach once a definitive opinion has been received from the Commission. However, it is important to note that the resultant opinion might result in certain types of low capacity incinerators (i.e. those in point (ii) above) having to comply with the WID, possibly to extent of requiring an A(2) PPC permit from the Local Authority’s if operating <1 tonne per hour [there is no lower threshold for Part A(2) plant].
Whilst this may, theoretically, remove the requirement for the SVS to approve the actual incinerator plant, SVS input may still be required to ensure general animal health requirements are safeguarded i.e. safe collection/storage of animal by-products prior to disposal.

The Environment Agency has agreed that where carcases are transported and then incinerated in plastic bags, this will not require approval under WID. Although plastic is not WID exempt, the quantities incinerated in such cases are small. However the incinerator will not be WID exempt if plastic bags are burnt separately as waste.

Low capacity incinerator plants

In addition to the provisions in Annex IV, Article 12.3 requires low capacity incinerator plants to –

(a) be used only for the disposal of the following animal by-products: dead pet animals and/or Category 1 SRM or ruminant carcases containing SRM, Category 2 and Category 3 material; and

(b) when located on a holding, be used only for the disposal of material from that particular holding. (In this context, the intention was for “holding” to mean the premises on which the material originated i.e. the farm on which the animal died. It was intended to prevent the disease risk associated with farmers bringing fallen stock from other farms on to their own farms, but was not intended to prevent knackers’ yards incinerating fallen stock.) In any case, regulation 9 of the Animal By-Product Regulations 2003 prohibits animal by-products being brought on to livestock premises in most cases.

Note that low capacity incinerator plants may not be used to incinerate Category 1 material other than that described above. This means that they are prohibited from incinerating the following animal by-products:

- Animals suspected/ confirmed with a transmissible spongiform encephalopathy e.g. BSE, scrapie;
- Animals killed in TSE control measures e.g. compulsory BSE offspring cull;
- Zoo and Circus animals;
- Experimental animals;
- Wild animals suspected of being infected with disease communicable to man or animals e.g. tuberculosis;
- Animal products containing certain prohibited residues;
- International catering waste. (In any case, incinerators burning catering waste must be WID approved)
Disposal

Regulation 1774/2002 (Articles 4.2, 5.2 and 6.2) requires animal by-products to be disposed of without undue delay. This means as soon as is reasonably practicable. But there are also safety reasons for doing so. If a ruminant has been left for a few days, the build up of methane and hydrogen sulphide in the stomach can cause the carcase to explode when incinerated. If it is not possible to incinerate immediately, operators may need to degas the carcase before incineration.

Annex IV

Low capacity incinerator plants approved under Regulation 1774/2002 must comply with Chapters I, II and IV-VII (although Chapter VII applies only to low capacity plants incinerating SRM or ruminant carcasses).

The provisions in each Chapter are shown in shaded boxes below. Commentary is provided underneath, as necessary, to explain how we intend to interpret these provisions.

Chapter I, General conditions (applies to all incinerator plants)

1. Incineration or co-incineration plants must be designed, equipped and operated in such a manner as to fulfil the requirements of this Regulation. The following hygiene conditions must be met:

   a) Animal by-products must be disposed of as soon as possible after arrival. They must be stored properly until disposal.

   b) Containers, receptacles and vehicles used for transporting unprocessed material must be cleansed in a designated area, thereby ensuring that waste water is treated during the storage referred to in Chapter III

   c) Preventative measures against birds, rodents, insects or other vermin must be taken systematically. A documented pest control programme must be used for this purpose.

   d) Cleaning procedures must be established and documented for all parts of the premises. Suitable equipment and cleaning agents must be provided

   e) Hygiene control must include regular inspections of the environment and equipment. Inspection schedules and results must be documented and maintained for at least two years.

These standards were originally designed for large-scale operations or operations bringing in animal by-products onto the premises from elsewhere. However, they should still be applied proportionately for all other operations.

Animal by-products must disposed of as soon as possible, and certainly within 24 hours of arrival unless suitable refrigerated storage is available. Any
temporary storage must be in a covered, well-drained area, or in leakproof covered containers. (See also Chapter VII for Low capacity SRM incinerator plants).

**NB:** The process of applying a ‘singe and burn’ to waste, i.e. sealing the carcases and/or killing pests, is not a permitted operating procedure and does not constitute an approved pre-incineration storage process.

The designated area for cleaning vehicles, containers and receptacles used for transporting animal by-products must be cleaned on a suitably drained hardstanding. For high capacity incinerator plants and low capacity SRM incinerator plants this should be the area covered by Chapter III or Chapter VII respectively. For other low capacity incinerator plants, sawdust may be used to absorb any liquid arising and the wet sawdust incinerated subsequently.

The pest control requirements should be proportionate to any vermin problem. The documentation may be included in the Standard Operating Procedure.

The premises must have adequate water supplies and equipment e.g. brushes, hoses, powerwashers, for cleaning. Disinfectant supplies may be necessary particularly for mobile incinerators. We would expect mobile incinerators to be thoroughly cleaned and disinfected inside and out between farms.

The incinerator plant operator should delegate a person to undertake an inspection of all parts of the premises on a weekly basis (or as appropriate depending on throughput etc.), so that necessary cleaning can be carried out as required. Details should be recorded e.g. in the Standard Operating Procedure.

2. The operator of an incineration or co-incineration plant must take all necessary precautions concerning the reception of animal by-products to prevent, or limit as far as practicable, direct risks to human or animal health.

To comply with paragraph 2 we would expect at least the following requirements to be met -

(a) there must be total physical separation between the incinerator and any livestock and their feed and bedding, with fencing where necessary;

(b) livestock farmers must incinerate only their own fallen stock; they must not incinerate fallen stock from other farms or premises other than in shared incinerators on non-livestock premises;

(c) livestock farmers must only incinerate whole ruminant carcases. Larger ruminant carcases (e.g. adult bovines) must be sent off-site for disposal if they are too large to fit in the incinerator
without cutting up. Where pigs and poultry are cut up, for example for post-mortem purposes, they must be cut up on a suitable area, the fluid collected and incinerated where practicable, and the by-products incinerated immediately. Abattoirs, butchers, collection centres and other premises approved to cut up or feed animal carcases or parts of carcases e.g. zoos and maggot farms may burn parts of animal carcases. Waste management licenses must be held as appropriate and the material must be stored in covered leakproof containers pending incineration; and

(d) any equipment (e.g. the shovel, rake, brushes) must be dedicated to operation of the incinerator and not used elsewhere on the farm.

Chapter II, Operating conditions (applies to all incinerator plants)

3. Incineration or co-incineration plants must be designed, equipped, built and operated in such a way that the gas resulting from the process is raised in a controlled and homogenous fashion, even under the most unfavourable conditions, to a temperature of 850°C, as measured near the inner wall or at another representative point of the combustion chamber as authorised by the competent authority, for two seconds.

The intention is for the gas to be subjected to 850°C for 2 seconds. We anticipate that this will require a combination of a primary chamber, and a secondary chamber containing an afterburner. The measurement point must be in the secondary chamber.

The temperature measurement device must not be in the flame area and must monitor the gas temperature leaving the secondary chamber. This may be at either the top or base of the stack.

However, for the purpose of ascertaining residence time, when the temperature is calculated at the base of the stack manufacturers/operators must not incorporate the volume of the stack as part of the afterburner chamber volume unless it has been proven that 850°C or more is achieved in this additional volume during normal automatic operation. Where the gas temperature is measured at the top of the stack this additional volume can be used.

NB: The incinerator temperature must be at 850°C prior to the introduction of the animal by-products. Both the afterburner and primary/main burner may be used to achieve this temperature. This would ensure that ALL of the emissions from the ABPs are subjected to 850°C during the incineration process. Without this safeguard some of the gas/emissions may not be subjected to the required temperature.
6. Animal by-products should, where practicable, be placed straight in the furnace without direct handling.

This provision recognises that, although animal carcases and other animal by-products should ideally be placed straight into the furnace by automatic or mechanical means, not all operators will have automatic handling facilities. It will not be practicable to require them to install such facilities, particularly if they only operate a low capacity incinerator.

However, where automatic facilities do not exist, we would expect the operator to have suitable operating procedures to ensure that the carcases are handled in a way that does not present a health and safety risk. This may include tipping animal by-products from a leak-proof container.

It is important for the correct functioning of the incinerator that it is not overloaded.

Chapter IV, Residues  (applies to all incinerator plants)

9. For the purposes of this Chapter, “residues” means any liquid or solid material generated by the incineration or co-incineration process, the wastewater treatment or other processes within the incineration or co-incineration plant. They include bottom ash and slag, fly ash and boiler dust.

10. Residues resulting from the operation of the incineration or co-incineration plant must be minimised in their amount and harmfulness. Residues must be recycled, where appropriate, directly in the plant or outside in accordance with relevant Community legislation.

Environmental Controls

The Waste Management (England and Wales) Regulations 2006 (known as the Agricultural Waste Regulations) came into force on 15 May 2006. From this date agricultural waste, other than whole carcases from agricultural premises, but including non-SRM ash from pig and poultry carcases derived from on-farm incineration is considered to be a ‘controlled waste’, and must be disposed of as such. In the case of non-SRM ash from on-farm incineration this should be via licensed landfill.

Farmers wishing to dispose of such ash on-farm must apply for a waste management licence (issued by the Environment Agency). The Regulations contain transitional provisions which allow farmers 12 months to apply for such a licence.

However, Member States have discretion under the Waste Framework Directive to provide exemptions from the licencing requirement. A number of exemptions are already available. During the 12 month transitional period, there will be another consultation on several additional exemptions- one of which would be to allow such non-SRM ash to be spread to land for
agricultural benefit. A decision on this possible exemption will be made before the 12 month transitional period is over.

During the 12 month transitional period farmers wishing to spread non-SRM ash to land should contact their local Environment Agency office, via the Environment Agency’s general helpline on 0845 9333111, for advice. The Environment Agency can also tell them which landfill sites in their local area can accept carcase ash for disposal.

Whole animal carcases from agricultural premises, but not the ash derived from their incineration, are excluded from the Waste Framework Directive as they are considered to be “already covered by other legislation” by virtue of Article 2(1)(b)(iii) of the Directive. This means that whole carcases will not be ‘controlled waste’ and national waste management controls will not apply as the Animal By-Product Regulations control their disposal.

Waste management licences are applied for and exemptions registered with the Environment Agency or SEPA.

**Animal By-Product controls**

Annex IV, Chapter IV (10) of the ABPR requires ash from incinerated whole carcases of cattle, sheep and goats, or other Specified Risk Material (SRM) to be disposed of to an appropriately authorised landfill approved under Directive 1999/31/EC [the Landfill Directive].

We are content for pet owners to have the ashes of their pets returned for scattering etc. but only if they have been incinerated in an incinerator which does not also incinerate SRM or ruminant carcases containing SRM.

Both incinerator manufacturers and the State Veterinary Service have expressed concern that it would not be possible to ensure that SRM ash/dust has been removed from the incinerator prior to the incineration of non-SRM material i.e. Domestic Pets. Therefore, unless a decontamination protocol (agreed with the SVS) has been carried out to the approving officers satisfaction then all of the ash from SRM/former SRM incinerators must, go to licensed landfill.

11. Transport and intermediate storage of dry residues in the form of dust must take place in such a way as to prevent dispersal in the environment (e.g. closed containers).
Chapter V, Temperature measurement  (applies to all incinerator plants)

12. Techniques must be used to monitor the parameters and conditions relevant to the incineration or co-incineration process. High capacity incineration and co-incineration plants must have and use temperature measurement equipment.

13. The approval issued by the competent authority, or conditions attached to it, must lay down temperature measurement requirements.

14. The appropriate installation and the functioning of any automated monitoring equipment must be subject to control and to an annual surveillance test. Calibration must be carried out by means of parallel measurements with the reference methods at least every three years.

15. Temperature measurement results must be recorded and presented in an appropriate fashion to enable the competent authority to verify compliance with the permitted operating conditions laid down in this Regulation in accordance with procedures to be decided upon by that authority.

Although paragraph 12 implies that low capacity incinerators do not need to have temperature measurement equipment, paragraphs 13 and 15 require that temperature measurement requirements are set out in the approval and are monitored and recorded. The purpose is to ensure that the operator can demonstrate to the competent authority that the incinerator is being operated in accordance with the Regulation.

It is accepted that the temperature will drop below 850°C during the start and end phases i.e. when the carcase is added and/or combustion ends. An incinerator must either have;

(a) an automatic temperature control system fitted with either (i) an automatic recording device or (ii) the operator must closely monitor and manually record a specified percentage of burns as specified in the approval e.g. monitor 10% of burns at 2 hour intervals; or

(b) a temperature measurement device e.g. a thermometer and (i) an automatic recording device or (ii) the operator must closely monitor and manually record a specified percentage of burns as specified in the approval e.g. monitor 10% of burns at 2 hour intervals.

The temperature probe must not be in the flame area and must monitor the gas temperature leaving the secondary chamber. The operating temperature must be monitored and used by the controller to ensure correct operation of the main burn cycle. Incorrect operation due to not reaching temperature must be signalled to the operator.

A methodology that can be used to verify that incinerators meet the required 2 second residence time for gases at 850°C is given at Appendix 3 (see also section on “Validating incinerators”).
Chapter VI, Abnormal operating (applies to all incinerator plants)

16. In the case of a breakdown, or abnormal operating conditions, the operator must reduce or close down operations as soon as practicable until normal operations can be resumed.

To comply with this requirement, we would expect operators to have suitable contingency plans to ensure that animal by-products are disposed of to an alternative permitted outlet (e.g. knackers’ yard, rendering plant or other incinerator) when their own incinerator is not operating or is not operating to the correct parameters.

Where the incinerator does not operate to the required time/temperature parameters, but the material is largely reduced to ash, the material should be re-incinerated once the incinerator is operating correctly again, or sent to another incinerator for re-incineration. Material that has not been fully incinerated remains an animal by-product and may not be disposed of by burial (e.g. in a landfill site) or applied to land.

Chapter VII – Incineration of Category 1 material referred to in Article 4(1)(b) (i.e. Specified Risk Material or whole carcases containing specified risk material) in low capacity incinerator plants

Whole carcases of cattle, sheep and goats contain specified risk material. Specified risk material is defined in Regulation (EC) No. 999/2001 –“The TSE Regulation”

1. The low capacity incineration plant must be located on a well-drained hard standing.

To comply with this requirement, we would expect the following requirements to be complied with –

(a) The incinerator plant must be located on a cleanable, impervious surface. Bunding must be provided unless there are good falls to a drain;

(b) the area on which the incinerator is sited must be drained to sewer or to an alternative (e.g. sump tank) for which the disposal method (e.g. soakaway) for the wastewater has been agreed with the Environment Agency or water authority as appropriate. A 6mm drain trap or screen is required at premises where SRM is removed, to minimise the amount of solid material entering the drainage system. Material collected in a drain trap or screen must be disposed of as SRM.

In extreme cases where drainage is impracticable, the incinerator may be located on a bunded hard-standing and covered to deflect rainfall. Sawdust could be used to absorb any liquid arising and the wet sawdust incinerated subsequently.
2. Livestock must not have access to the low-capacity incineration plant, animal by-products that are awaiting incineration or ash resulting from the incineration of animal by-products. If the low-capacity incineration plant is located on a livestock holding –
   • there must be total physical separation between the incinerator and the livestock and their feed and bedding, with fencing where necessary;
   • equipment must be dedicated entirely to operation of the incinerator and not used elsewhere on the farm; and
   • the operators must change their outer clothing and footwear before handling livestock or livestock feed.

3. The storage of animal by-products and ash must be covered, labelled and leak proof.

Animal by-products and ash must be kept in separate, covered, leakproof containers labelled “SRM Category 1” and “SRM Category 1 Ash” respectively

4. The operator must check that animal by-products are incinerated in such a way that they are completely reduced to ash. Ash must be disposed of to a landfill approved under Directive 1999/31/EC.

5. Incompletely incinerated animal by-products must not be disposed of to landfill, but must be re-incinerated or otherwise disposed of in accordance with the Regulation.

Ash from low capacity incinerator plants which burn whole ruminant carcases or other Specified Risk Material must be disposed of to a landfill site approved under the Landfill Regulations (England & Wales) Regulations 2002.

6. The low-capacity incineration plant must be equipped with an afterburner.

7. The operator must keep records of the quantities, category and species of animal by-products incinerated and the date of incineration.

This is a requirement for all incinerator plants

8. The competent authority must inspect the low-capacity incineration plant before approval and at least once a year to monitor compliance with the Regulation.

Records
Regulation 35 of the enforcing Animal By-Products Regulations 2005 additionally requires operators to keep records of the quantities and type of material incinerated (i.e. numbers and species of animals) and the date of incineration. Where appropriate, operators could use records which are kept for other purposes e.g. mortality records kept under welfare legislation.
ENVIRONMENTAL PROVISIONS APPLYING TO LOW CAPACITY ANIMAL CARCASE INCINERATORS

1. General recommendations to avoid polluting the air can be found in the Air Code or the Prevention of Environmental Pollution from Agricultural Activity (PEPFAA) Code.

2. If the Animal By-Products Regulation 1774/2002 does not apply then the Waste Incineration Directive, 2000/76/EC, (WID) will apply to new incinerators from 28 December 2002 and to existing incinerators from 28 December 2005. The provisions of the WID are essentially technical. Controls under both Regulation 1774/2002 and the WID apply in addition to the current controls listed below.

Current position

3. Incinerators with a capacity to operate at less than 50 kg/hour are controlled by the waste management provisions under Part II of the Environmental Protection Act 1990. These premises are regulated by the Environment Agency and are required to either –

   (a) be controlled by a waste management licence e.g. Pet crematoria; or
   
   (b) operate within the exemption from licensing provided by paragraph 29 of Schedule 3 of the Waste Management Licensing Regulations 1994. This is subject to a number of restrictions and applies only if the waste is incinerated at the site of production by the person producing it, and there is no risk to human health or the environment.

Planning controls

4. Operators are advised to contact their local planning authority for advice on the need for planning permission, if necessary using a Certificate of Lawfulness (see below), before acquiring or installing an incinerator.

Certificate of Lawfulness :

There are two types of certificate, one which ascertains the lawfulness of an existing use, operation etc. and a second certificate which may be used to ascertain the lawfulness of a proposed use or development.

(1) 'Lawful Development Certificate in respect of lawfulness for an existing use, operation or activity in breach of a planning condition' may be utilised by any person wishing to ascertain whether;
(a) any existing use of buildings or other land is lawful;
(b) any operations i.e. building works, which have been carried out are lawful;
(c) any failure to comply with a condition/limitation attached to a planning permission is lawful.

Application for such a certificate is made using a form available from the Local Planning Authority

(2) 'Lawful Development Certificate in respect of a proposed use or development' may be utilised by any person wishing to ascertain whether;

(a) any proposed use of buildings or other land is lawful;
(b) any operations i.e. building works, proposed are carried out lawfully.

Application for such a certificate is made using a form available from the Local Planning Authority.

5. The need for planning permission will need to take account of legal considerations to establish whether the incinerator is "development" or not under the Town and Country Planning Act 1990. These considerations will include whether the incineration is ancillary to agriculture (is it required for agricultural purposes or is it an industrial operation), is the incinerator used for stock from other holdings and not least whether the incinerator is a use of land or operational development (is it mobile or fixed).

6. An animal waste incinerator may be exempt from the need for a specific grant of planning permission where it accords with permitted development rights under either;

- Part 6 of the Town and Country Planning (General Permitted Development) Order, 1995, as amended, where the plant is located on an agricultural holding; or
- Part 8 of the Town and Country Planning (General Permitted Development) Order, 1995, as amended, where the plant is located on industrial land or within an industrial building (Class B2 of The Use Classes Order, 1987. as amended)

7. A mobile incinerator might also require planning permission depending on its size, permanence and physical attachment to the ground. Once again the operator should seek advice from their local planning authority.

8. As well as complying with any planning controls, in the interests of reducing any neighbour conflict, operators are advised to seek out locations for incinerators which are less likely to result in any harm to residential amenity.

Pollution Prevention Control Regulations
9. Large pig and poultry installations will be subject to control under the PPC Regulations and the Environment Agency’s Standard Farming Installation Rules and Guidance and these rules will require farmers to adopt the ‘best available technique’ (BAT). Where an on-site incinerator is deemed to be within and directly associated with the pig or poultry installation the incinerator will fall within these rules (i.e. emission/operating standards considered as being BAT may have already been set for the incinerator in the permit to operate under the PPC). However, these rules do not over-ride the controls in the Regulations. Where an installation includes an animal carcase incinerator, we propose that the Environment Agency/SEPA should alert the State Veterinary Service to the permit and its conditions. Similarly, the State Veterinary Service should ensure that the Environment Agency/SEPA is aware of the approval under the Regulations.

**Burning of tallow**

10. Rendering plants and some other premises burn tallow as fuel. We consider that such tallow is waste. Its burning is therefore controlled by the Waste Incineration Directive (WID), see note below, and the burners will need to be approved under, and comply with the relevant requirements of the WID. It is recognised that it will be difficult for these burners to comply with the requirement for the tallow to be burnt at 850°C for 2 seconds and the Environment Agency has accepted that for existing burners, a derogation from one of these parameters may be appropriate. However, this is not appropriate for new burners which must comply with the best available techniques, which are currently those laid down in the WID. New burners must therefore be able to operate at 850°C for 2 seconds. Derogations from these parameters would only be granted for new burners if the operator provides a sound justification; if the plants do not produce greater quantities of residues (e.g. ashes) or residues with a higher content of organic pollutants; and the levels of total organic carbon in the ash and emissions into air of carbon monoxide are not increased.

**NB:** The WID is being implemented primarily through the PPC regime. Incinerator plants less than 1t/hr would be regulated by the relevant local authority as a Part A(2) of Section 5.1 of Part 1 of Schedule 1 of the PPC regulations (unless carried out as part of another Part 1 Schedule 1 activity).
APPENDIX 3

Type Approval of Incinerators to confirm “2 second residence time”

This should be done in two stages.

**Stage 1 – Actual Measurement of temperature in an empty incinerator**

From ambient temperature, switch on the incinerator and heat to the required temperature of 850 °C using automatic temperature control.

This test is complete once the incinerator has reached 850 °C. Measure the temperature by use of the incinerator temperature probe (Point C on attached diagram at end). If none is fitted measure the temperature after the last of the afterburner insulation. This will probably be at the base of the stack.

**Liquid Burners**
Once this has been completed, record the settings for the burners used. This data will then be used in the second stage.

**Gas Burners**
Once this has been completed, measure the gas flow rate to the burners. This data will then be used in the second stage.

Data to record:

- Number of burners

For each burner:
- Air flow setting
- Liquid Burners
  - Parameters required to determine fuel flow rate (this will vary according to burner design. Nominally expected to include nozzle size and pressure for a liquid burner.)
- Gas Burners
  - Measure fuel flow rate directly from the gas meter.
Stage 2 – Theoretical calculation of afterburner gas flow dwell time

Data required:

From burner manufacturer:
- Flow rate of products of combustion for settings recorded from Stage 1 corrected to 850 °C.

From incinerator manufacturer:
- Afterburner chamber volume as measured between the last injection point of air, point B* and the temperature probe, point C**.

* This is either the After Burner or any air inlet after (downstream of) the After Burner position.
** This point is used since it is ensuring 850 °C. Volumes past this point can be included if in the Stage 1 testing it has been proved that 850 °C or more is achieved in this additional volume during normal automatic operation.

Note: The volume in the Main Chamber, point A to point B is NOT included in this calculation.

Calculate a total gas flow rate (Qm + Qa) from the burner manufacturer data. Multiple this by the standard waste gas flow factor (Kw) to represent the waste being burnt.

(The suggested standard factor for waste gas flow is 1.4 for a <50kg/hr animal waste incinerator operating to the above conditions. This is as a result of various incinerator tests and theoretical calculations of incinerator and burners combinations. See below)

This total flow rate (Qt) and the afterburner volume (V) can then give a residence time (T) for the incinerator.

Example

\[
\begin{align*}
Q_m \ [m^3/s] &= \text{Flow rate of products of combustion of Main Burner at 850°C} \\
Q_a \ [m^3/s] &= \text{Flow rate of products of combustion of After Burner at 850°C} \\
K_w &= \text{Standard waste gas flow factor of 1.4} \\
Q_t \ [m^3/s] &= \text{Adjusted total gas flow rate} \\
V \ [m^3] &= \text{After Burner chamber volume between last air injection point* and temperature probe**.} \\
T \ [s] &= \text{Residence time in After Burner chamber}
\end{align*}
\]

Calculation

\[
Q_t = K_w \times (Q_m + Q_a)
\]

\[
T = \frac{V}{Q_t}
\]

This time T must be greater or equal to 2 seconds.
Calculation of Factor for Waste gas flow

A burner supplier performed a series of tests on several burners whereby the liquid fuel flow was fixed and the air damper setting altered to give three different wet Oxygen percentages. The back calculation of combustion airflow was then performed to for each oxygen setting 6,8,10 % wet.

The burners used on a main test incinerator are a Minor 8 and Minor 4 combination with settings as those for 6%[O$_2$]. We know that this incinerator does burn close to the 50kg/hr rate. We then set up a calculation for the replication of the fuel and air inputs for the burner combination and included 50 kg/hr of waste with whole animal ultimate composition. The waste gas flow rate produced was noted with the calculated bulk temperature.

From the burner calculations A+B the waste gas volumes for each flame temperature were also noted and corrected back to 850°C The ratio of waste gas products with waste, to waste gas products with no waste is calculated.

*Note: The flows have been calculated at approx. 40% excess air.*

**Liquid fuel flow rates**

- Minor 4 Nozzle 0.75 gph@12barg 3.1 kg/hr
- Minor 8 Nozzle 1.25 gph@12barg 5.2 kg/hr

**Calculations from A,B,C**

From A Minor 4 Fuel input 3.1kg/hr, 6% wet O2 in gases = Combustion air 53.5m3/hr
Waste gas flow 349Am3/hr @1560°C

From B Minor 8 Fuel input 5.2 kg/hr, 6% wet O2 in gases = Combustion air 89.1m3/hr
Waste gas flow 585Am3/hr @1569°C

From A+B Combustion air of 'combination' 53.5+89.1=143m3/hr

Sheet C Fuel flow = 3.1+ 5.2= 8.3kg/hr. Combustion air = 143 m3/hr
Waste 50kg/hr of whole carcass ultimate composition (source bovine CSIRO)

Waste gas flow 817 Am3/hr @ 884°C corrected to 850 = 792Am3/hr.

Sheet A+B WG flow A corrected to 850°C 213Am3/hr
WG flow B corrected to 850°C 358Am3/hr
Combined flow rate 571Am3/hr @850°C

**Factor Calc 792/571= 1.4 appx**
SVS Site Check

To approve the incinerator the SVS will ensure that
1. The incinerator has Type Approval
2. The incinerators Type approval burner flow rates or settings are being used or bettered and all the animal by-product is turned to ash in the time scale for that model.

Diagram of a typical incinerator requiring validation of 2-second residence time